SFUND RECORDS CTR
2277405

NORTHROP GRUMMAN

Northrop Grumman Systems Corporation
One Hornet Way, D4/110
El Segundo, California 90245

January 3, 2012

Elizabeth C. Brown
(310) 331-6752
elizabeth.c.brown@ngc.com

Keith Olinger
Enforcement Office (SFD-7-5)
U.S. EPA, Region 9
75 Hawthorne Street
San Francisco, CA 94105

RE: Northrop Grumman's Response to USEPA's Request for Information related to Stringfellow Superfund Site

Dear Mr.Olinger:

Enclosed is the response of Northrop Grumman Systems Corporation (Northrop Grumman) to the request for information from the United States Environmental Protection Agency, Region 9 (USEPA) received by Northrop Grumman on November 4, 2011. That request was pursuant to USEPA's authority under Section 104(e) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980. Northrop Grumman's response was initially due within thirty days of receipt of USEPA's request. On November 15, 2011, however, Northrop Grumman requested and was granted a 30-day extension of time to submit its response, causing the response to be due on January 4, 2012.

The entity responding to this information request is Northrop Grumman Systems Corporation, a wholly-owned subsidiary of Northrop Grumman Corporation. All future references to Northrop Grumman in this letter and in the enclosed response are to Northrop Grumman Systems Corporation.

Northrop Grumman submits this response without admitting any liability or any issues of law or fact and without prejudice to any position it may take in connection to this or any related matter. Northrop Grumman further reserves its right to supplement, change or correct any information provided in the attached response should it become necessary to do so, but without any obligation to supplement its response on an ongoing basis.

Finally, I wanted to provide some additional information about the document search I undertook. To date, I have located about 30 boxes of files related to the Stringfellow site still in Northrop Grumman's possession. Most of these boxes relate to Northrop Grumman's involvement with the Stringfellow Superfund Site as a PRP and the myriad litigation matters the Site spawned. Consequently, most of the boxes were not pulled or reviewed because, based on the description of the files contained in the boxes (including dates the files were created), they did not appear to contain any documents that would have been responsive to EPA's present information request. Unfortunately, I was not able to locate Northrop Grumman's files that contained copies of the

letters provided by EPA dated September 24, 1982 and November 24, 1982 from Northrop to EPA. As a result, I have no explanation why in November 1982 both EPA (Michael Green) and Northrop (Frank Smith) determined that Northrop's ***Declaration and Agreement to Produce Documents*** and earlier response to EPA's 104(e) information request would not include "documents relating to a ground lease between Stringfellow and the Nortronics Division of the Northrop Corporation." Clearly both parties were aware of that lease in 1982 but deemed it to be irrelevant to EPA's search for information relating to transactions between Northrop and the Stringfellow operations in Glen Avon, California.

Very truly yours,

Elizabeth Brown

Elizabeth C. Brown
Senior Counsel
Environmental Law

Enclosure

Northrop Grumman's Response to
US EPA Region IX CERCLA Section 104(e) Information Request
Regarding the Stringfellow Superfund Site, Riverside County, CA

Northrop Grumman asserts the following general privileges, protections and objections with respect to USEPA's Request for Information (RFI) received by Northrop Grumman on November 4, 2011.

All questions regarding Northrop Grumman's responses to USEPA's information request should be directed to: Elizabeth C. Brown, Northrop Grumman Corporation, One Hornet Way, D4/110, El Segundo, CA 90245, elizabeth.c.brown@ngc.com, phone (310-331-6753) or fax (310- 263-5365).

General and Specific Objections to the RFI

A. Northrop Grumman asserts all applicable privileges and protections it has with regard to USEPA's enumerated inquiries including the attorney-client privilege, the attorney work product doctrine, materials generated in anticipation of litigation, and privileges for materials which are proprietary, company confidential, or trade secret. CERCLA does not require a party to divulge such information in response to information requests.

B. Northrop Grumman objects to the requests on the grounds that the requests use undefined terms and are overbroad, vague, ambiguous, irrelevant and unduly burdensome so as to exceed statutory authority under CERCLA and contravene Northrop Grumman's constitutional rights. In responding to these requests, Northrop Grumman relies on the definition of these terms as they are commonly used (*i.e.*, their dictionary definitions).

C. Northrop Grumman objects to the requests on the grounds that the requests are overbroad and unduly burdensome in that they seek information or documents regarding activities conducted more than 40 years ago. As such, each of these requests exceeds USEPA's statutory authority under CERCLA and contravenes Northrop Grumman's rights.

D. Northrop Grumman objects to any requirement to produce documents or information already in the possession of a government agency or already in the public domain. Such requirement is duplicative and, therefore, unduly burdensome.

E. Northrop Grumman hereby disavows any obligation to supplement these responses on an ongoing basis. CERCLA Section 104(e)(2) authorizes USEPA to require submission of information upon reasonable notice. Northrop Grumman conducted a review of available records that was practicable given the time period Northrop Grumman had to respond to this request and has supplied all information concerning the facility which was found during that review. If more information is desired, Northrop Grumman respectfully requests further reasonable notice that such information is desired.

F. Northrop Grumman objects to the requests to the extent they seek trade secrets or other confidential business information.

G. Notwithstanding and without waiving these objections, and subject to them, Northrop Grumman has prepared this response based upon the information available to it. Where requests are vague, ambiguous, overbroad, unduly burdensome, or beyond the scope of USEPA's authority pursuant to Section 104(e) of CERCLA, Northrop Grumman is making appropriate and reasonable efforts to provide responsive information based on Northrop Grumman's interpretation of the requests. To the extent that information submitted herein is not required by law or is otherwise outside the scope of USEPA's 104(e) authority, that information is voluntarily submitted. Northrop Grumman waives no rights or protection of information it voluntarily submits.

RESPONSES

Subject to the foregoing, Northrop Grumman provides the following responses:

USEPA Preface Statement: Information provided to EPA indicates that Nortronics conducted testing of explosive devices in the area surrounding the former Stringfellow hazardous waste site from about 1960 to 1980. Research conducted at EPA's request suggests that Nortronics was not a separate entity but rather a division of Northrop Corporation, which was formerly known as Northrop Aircraft, Inc. (the "Company"). Corporate records indicate that Northrop Grumman Systems Corporation is the successor by merger to the Company.

Request 1. State the full legal name, address, telephone number, position(s) held by, and tenure of the individual(s) answering any of the questions below on behalf of the Company and Northrop Grumman Systems Corporation.

Response to Request 1: All responses provided were prepared by Elizabeth C. Brown, Senior Counsel, Environmental Law, Northrop Grumman Corporation after reviewing documents determined to be responsive to USEPA's RFI. Those documents are attached to this response. Ms. Brown can be reached by regular mail at One Hornet Way, D4/110, El Segundo, CA 90245, by email at elizabeth.c.brown@ngc.com, by telephone at 310-331-6753 or by fax at 310- 263-5365.

Request 2. Identify the individuals who are or were responsible for environmental matters for the Company's operations located in or near Pyrite Canyon near Glen Avon, California (the "Site"). Henceforth, the term "Site" shall be interpreted to include all real property surrounding the former Stringfellow hazardous waste disposal site and any improvements thereto. For each individual responsible for environmental matters, provide his/her full name, current or last known address, current or last known telephone number, position titles, and the dates each individual held such position.

Response to Request 2: Given that Nortronics operated its Remote Ordinance Facility in Riverside County from 1 November 1965 to 31 October 1972, it is virtually impossible today to identify persons who were responsible for environmental matters associated with Nortronics operations. From interview notes taken by a Northrop Grumman employee (Norman Sealander) of Northrop Grumman personnel familiar with its operations at the Stringfellow site, we know that the following individuals worked at the Stringfellow site in varying capacities: Jerry A. Reed; Larry B. Law; Del Mott; and Merrill Skilling. For notes related to these interviews, see Exhibit D – Documents describing Northrop Activities at the Site.

Request 3. Explain the Company's present operational status (e.g., active, suspended, defunct, merged, or dissolved).

Response to Request 3: Northrop Grumman Systems Corporation ("NGSC") is the successor to Northrop Corporation and Northrop Aircraft Inc. NGSC is an active corporation, incorporated in Delaware and headquartered in Falls Church, VA. Northrop Corporation and Northrop Aircraft no longer exist.

Request 4. Provide the date the Company was incorporated, formed, or organized. Identify the State in which the Company was incorporated, formed, or organized.

Response to Request 4: Northrop Aircraft, Inc. was incorporated in California in March 1939. Northrop Aircraft, Inc. changed its name to Northrop Corporation in March 1959. Northrop Corporation became Northrop Grumman Corporation (NGC) after its merger with Grumman Corporation in 1994. NGC was a Delaware corporation. NGC became NGSC in 2001 in connection with NGC's acquisition of Litton Industries Inc. NGSC is a Delaware corporation. The NGC that exists today is different than the NGC that existed prior to 2001, and today is purely a holding company with no operations and no employees.

Request 5. Provide a copy of the articles of incorporation, partnership agreement, articles of organization, or any other documentation (together with any amendments) demonstrating the particular business structure under which the Company existed or operated since its inception.

Response to Request 5: If EPA still wants the articles of incorporation for Northrop Aircraft, Inc. after reviewing the other information proved in the response to these requests, those articles can be provided.

Request 6. If the Company is or was operating under a fictitious business name at the Site, identify the fictitious name and the owner(s) of the fictitious names, and provide a copy of the Fictitious Business Name Statement filed with the county.

Response to Request 6: To NGSC's knowledge, Northrop Aircraft, Inc. was not operating under a fictitious business name at the Site. EPA is correct that Nortronics was a division

of Northrop Corporation. It was not a separate legal entity. The various divisions within Northrop Corporation were used purely for internal organizational purposes. It appears that Northrop changed the name of the Nortronics Division to the Electro-Mechanical Division in 1969.

Request 7. Indentify the dates the Company, under any of its current or former business structures, owned real property at the Site. Provide a copy of the title documentation evidencing the Company's ownership of the real property, a list of the assessor parcel numbers (current and historical), the street addresses associated with each parcel, and a map showing the locations and boundaries of all such parcels.

Response to Request 7: Northrop never owned any real property at the Site. Its Nortronics Division leased approximately 100 acres of land at the Site from 1 November 1965 to 31 October 1972 (a period of seven years). Northrop also leased space from Teledyne McCormick Selph at its "Riverside facilities" for the purpose of additional explosives storage for about a year between May 1971 and March 1972. The agreement between Teledyne McCormick Selph and Northrop's Electro-Mechanical Division (formerly the Nortronics Division) does not provide an address for Teledyne McCormick Selph's Riverside facilities, but NGSC understands it was located immediately adjacent to the Site because McCormick Selph agreed to permit Stringfellow and Northrop to cut a firebreak along the property boundary between McCormick Selph and the land leased by Northrop at the Site. See various documents attached as Exhibit B – Teledyne McCormick Selph Documents. It also appears that McCormick Selph leased some property from Stringfellow too (see notes from interview with Jerry Reed in Exhibit D). It is not clear whether McCormick Selph's "Riverside facilities" are the same as the land leased from Stringfellow or if it had two separate facilities.

Request 8. For any period of time in which the Company, under any of its current or former business structures, owned real property at the Site, provide the name, address, and phone number of any tenant, lessee or contractor. Identify the time period of each tenant's lessee's and contractor's operations at the Site and briefly describe the type of operations conducted or performed by each. Provide a copy of each lease, rental agreement, or any other document between the Company and its tenants, lessees and contractors for operations at the Site.

Response to Request 8: Northrop did not own any real property at the Site nor did it sublease the property that it was leasing from Stringfellow Quarry. To NGSC's knowledge, when Northrop's lease terminated on 31 October 1972, Northrop vacated the Site. Several of the documents attached to this response reflect the fact that companies other than Nortronics were conducting explosives related work in or near the Site. For example, in 1965 the Site was being used for: (1) a Stringfellow-operated quarry (where explosives were used for quarry operations); (2) a Stringfellow-operated heavy construction business; (3) two separate ordinance operations on leased land (Universal Propulsion and McCormick Selph); (4) an automobile wrecking yard; (5) a heavy equipment rental yard on leased land; and (6) the Stringfellow-operated acid and alkali pits.

Request 9. Identify and provide last known contact information for all prior and subsequent operators/occupants and property owners of the Site. Provide the time period of each party's operations or ownership and describe the type of operations each conducted at the Site.

Response to Request 9: There is some correspondence contained in Exhibits A and B with Universal Propulsion and McCormick Selph that contains addresses and names associated with these companies from 1966. Other than this information, NGSC has no other information responsive to this request.

Request 10. Provide the dates that the Company, under any of its current or former business structures, operated at the Site. Provide a detailed description of the Company's operations, including all activities related to aerospace and defense research and testing.

Response to Request 10: Northrop leased property at the Site from 1 November 1965 to 31 October 1972 for the purpose of operating its Remote Ordnance Facility. The stated use of the Remote Ordnance Facility was for the development, testing, and loading in pilot quantities of explosive ordnance, delivery systems, and tactical weapon systems. In 1965, when Northrop was contemplating a lease of the Site, it had some of these capabilities at its Anaheim facility, but the anticipated workload was expected to exceed the capacity of the Anaheim facility. Northrop also had access to a long-range (4000 yards) test firing range at Camp Irwin, but that site was too far away from Anaheim to serve Northrop's current needs. See Exhibit D – Documents describing Northrop Activities at the Site. See also Exhibit E – Facility Operating Procedures and Test Results for the Northrop Remote Ordnance Facility.

Request 11. Identify and describe the portion(s) of the Site where the Company conducted operations, and provide a copy of each lease agreement, subcontract agreement, and other document which establishes the Company's relationship to the real property owner during the time period of the Company's operations at, or occupancy of, the Site.

Response to Request 11: For a copy of the lease between Northrop and the Stringfellow Quarry Co. and various other correspondence related to that lease see Exhibit A – Stringfellow Lease and Related Correspondence. The lease describes the portion of the Site leased by Northrop.

Request 12. Provide a scaled map of the Site that shows where the Company conducted operations. The map should include the locations of significant buildings, equipment and geographical features. Indicate the locations of all chemical and waste storage areas, and the areas where the testing of any rocket fuels, propellants or explosives was conducted.

Response to Request 12: Exhibit A – Stringfellow Lease and Related Correspondence contains a plot plan or schematic of the Northrop Remote Ordnance Facility.

Request 13. Provide a list of all chemicals and hazardous substances used by the Company at the Site, identifying the chemical composition and quantities used. Provide copies of Material Safety Data Sheets ("MSDSs") for all hazardous substances used.

Response to Request 13: Exhibit E – Facility Operating Procedures and Test Results for the Northrop Remote Ordnance Facility contains various procedures associated with work performed at Northrop's Remote Ordnance Facility. By reviewing those procedures, NGSC was able to compile the following list of chemicals apparently used at that facility:

Triethylaluminum (TEA); hexane; hydrochloric acid; mineral oil; Vistanex (which NGSC believes may be polyisobutylene[1]); Blue Goop (which NGSC believes may be a petroleum based lubricant); M9 propellant (which NGSC believes may be a mixture of nitrocellulose, nitroglycerin, ethyl centralite and potassium nitrate); RDX (which NGSC believes may be cyclotrimethylene trinitramine); stearic acid; and tetryl (which NGSC believes may be pyrenite or trinitrophenylmethylnitramine).

No other information is available at this time regarding the use of chemicals by Northrop at the Site.

Request 14. If explosives or blasting agents were manufactured or used in the Company's operations at the Site, provide a complete list of the explosives and blasting agents and their chemical components, the time period the respective explosives and blasting agents were manufactured or used, and a map showing the locations where the respective explosives and blasting agents were stored and detonated. Provide copies of MSDSs for all explosives and blasting agents.

Response to Request 14: NGSC has very little information today about the explosives used at its Remote Ordnance Facility other than what is contained in Exhibits D and E. Based on review of those documents, NGSC believes that the explosives used at the Site were Triethylaluminum (TEA); M9 propellant (which may be a mixture of nitrocellulose, nitroglycerin, ethyl centralite and potassium nitrate); RDX (which may be cyclotrimethylene trinitramine); and tetryl (which may be pyrenite or trinitrophenylmethylnitramine).

Request 15. If rocket fuel or propellants were manufactured or used in the Company's operations at the Site, provide a complete list of the rocket fuel and propellants and their chemical components, the time period that the respective rocket fuel and propellants were manufactures or used, and a map showing the locations where the respective rocket fuel and propellants were stored and tested. Provide copies of MSDSs for all rocket fuel and propellants.

[1] The chemical composition information provided in Response to Request 13 was obtained by doing some cursory internet searches in December 2011. This information may or may not accurately reflect the composition of materials used by Nortronics at its Remote Ordnance Facility between 1965 and 1972.

Response to Request 15: Northrop did not conduct any rocket firing at its Remote Ordnance Facility. This prohibition was a condition of Northrop getting the necessary Conditional Use Permit (CUP) from the County of Riverside that allowed its other explosives-related activities. Exhibit C – Nortronics CUP and Associated Correspondence and Newspaper Articles contains various documentation of this fact.

Request 16. If any substance containing perchlorate was utilized in any of the Company's operations at the Site, provide a complete description of those operations. Indicate the approximate volume of perchlorate substances used per month at the Site, the dates perchlorate substances were used, and the storage and disposal practices in effect during the Company's operations at the Site for materials containing perchlorate. Include all documentation referencing or detailing the Company's use and disposal of perchlorate-containing substances.

Response to Request 16: To the best of NGSC's knowledge, Northrop did not use any substance that contained perchlorate. NGSC does not know if Stringfellow Quarry, Universal Propulsion or McCormick Selph might have used materials that contained perchlorate.

Request 17. Provide copies of hazardous material business plans and chemical inventory forms (originals and updates) submitted by the Company to city, county, and state agencies for the Site.

Response to Request 17: NGSC does not have this information.

Request 18. Please identify all leaks, spills, or other releases into the environment of any hazardous substances or pollutants or contaminants that have occurred at or from the Site. In addition, identify and provide supporting documentation of:

a. The date each release occurred;
b. The cause of each release;
c. The amount of each hazardous substance, waste, or pollutant or contaminant released during each release;
d. Where each release occurred and what areas were impacted by the release; and
e. Any and all activities undertaken in response to each release, including the notification of any local, state, or federal government agencies about the release.

Response to Request 18: NGSC is not aware that any leaks, spills or other releases occurred as a result of Northrop's activities at the Site.

Request 19. Provide copies of all sampling and investigation reports for the Site that contain the laboratory or field analyses of the water quality of the aquifers, mine water, surface water, pit

lake, tailing pond discharges and receiving streams, air quality and soil quality, including a map showing the sampling locations.

Response to Request 18: **NGSC has no such reports associated with its Remote Ordnance Facility. NGSC has voluminous records, including reports of the environmental conditions at and downgradient of the Stringfellow Superfund Site as a result of its involvement at that site as a PRP. It is NGSC's understanding that such reports are not what EPA is seeking in this request. In any event, NGSC has no such reports as a result of its status as a PRP at the Stringfellow Superfund Site that EPA would not already have.**

Request 20. Describe all waste materials generated from the Company's operations at the Site. Provide information on the storage and disposal methods for each waste, the frequency of disposal, and quantities of waste generated annually. Provide copies of all manifests or other documents evidencing the Company's offsite disposal of wastes from the Site.

Response to Request 20: **The only information NGSC has on this subject is a statement by Jerry A. Reed in September 1982 that there was "no disposal of ordnance residue, liquid wastes, or any other wastes onsite" from the Nortronics Remote Ordnance Facility and a similar statement by Merrill Skilling that "no waste chemicals, explosives, or any other materials were disposed of on Stringfellow land by Northrop Corp." See Exhibit D. NGSC does not know whether waste from the Remote Ordnance Facility might have been sent elsewhere for disposal.**

Request 21. State whether any fuels, propellants, explosives or other substances or devices that were used in the Company's operations are still stored at the Site, and state whether any bunkers or other storage locations remain at the Site. Indicate on a map the current storage locations of these substances and devices.

Response to Request 21: **Northrop vacated the Site in October 1972 and left no explosives behind. NGSC has no such materials still stored at the Site today. NGSC does not know whether any bunkers or other storage areas remain at the Site today.**

Request 22. Provide copies of all state and federal permits related to the Company's operations at the Site, including permits that the Company obtained on behalf of other entities.

Response to Request 22: **The only permit related to the Company's operations at the Site of which NGSC is aware was a Conditional Use Permit (CUP) from the County of Riverside. See Exhibit C – Nortronics CUP and Associated Correspondence and Newspaper Articles.**

Request 23. Information provided to the EPA indicates that the Company formerly operated at the Site as contractor to the U.S. Government. State whether there exist any indemnification or

hold harmless agreements between the U.S. Government and the Company with regard to the Company's operations at the Site, and provide copies of all such agreements.

Response to Request 23: NGSC has not been able to locate any of the underlying government contracts pursuant to which Northrop conducted its operations at the Site. Various documents associated with the justification for entering into the Lease with Stringfellow Quarry list the government contracts pursuant to which work was being performed at the Site, but we have not located the actual contracts. See Exhibit A. Based on the time period in question, however, it is likely that the contracts contained some indemnification or hold harmless agreements between the U.S. Government and Northrop.

Request 24. As stated above, corporate records show that in 1985 the Company merged into Northrop Grumman Systems Corporation. However, if Northrop Grumman Systems Corporation is aware of any environmental liabilities of the Company having been transferred to and assumed by another entity, provide an explanation of the transaction by which this was affected and identify the entity that assumed the liabilities, including current contact information for that entity. Please also provide a copy of all documentation evidencing the assumption of the Company's environmental liabilities by such other entity.

Response to Request 24: NGSC has not divested itself of any part of its business that would give rise to a claim that some other entity has assumed the environmental liabilities of Northrop Aircraft, Inc. NGSC (or its predecessor Northrop Grumman Corporation) was, however, a PRP at the Stringfellow Superfund Site. There have been numerous agreements and settlements over the years associated with the resolution of the environmental cleanup at the Site, some or all of which would absolve NGSC of any further liability for the cleanup of the Site.

Exhibit A

Stringfellow Lease and Related Correspondence

xc: HERiggins, BETrites, MESkilling, EHellmers

25 August 1971

Registered - Return Receipt Requested

Stringfellow Quarry
Post Office Box 6
Riverside, California

Re: Lease Agreement Between Stringfellow Quarry Co. and Northrop Corporation dated 1 Sept. 1965

Gentlemen:

Northrop Corporation, Electro-Mechanical Division, hereby exercises its sixth option to extend the lease for an additional period of one year, November 1, 1971 through October 31, 1972.

Very truly yours,

Jerome M. Simon

INSTRUCTIONS TO DELIVERING EMPLOYEE

☒ Show to whom, date, and address where delivered ☐ Deliver ONLY to addressee

(Additional charges required for these services)

RECEIPT

Received the numbered article described below.

REGISTERED NO. 8721

CERTIFIED NO.

INSURED NO.

SIGNATURE OR NAME OF ADDRESSEE (*Must always be filled in*)
POST OFFICE
3390 ORANGE STREET
RIVERSIDE CA 92502

SIGNATURE OF ADDRESSEE'S AGENT, IF ANY

DATE DELIVERED
AUG 27 1971

SHOW WHERE DELIVERED (*only if requested*)

655—16—71548-10 GPO

INSTRUCTIONS TO DELIVERING EMPLOYEE

☐ Show to whom, date, and address where delivered ☐ Deliver ONLY to addressee

(Additional charges required for these services)

RECEIPT

Received the numbered article described below.

REGISTERED NO. 8631	SIGNATURE OR NAME OF ADDRESSEE (*Must always be filled in*)
CERTIFIED NO.	
INSURED NO.	SIGNATURE OF ADDRESSEE'S AGENT, IF ANY Kathie Brusca
DATE DELIVERED OCT 1 1978	SHOW WHERE DELIVERED (*only if requested*) Sixteenth Ave. Sec.

c55—16—71548-10 GPO

J. M. SIMON

POST OFFICE DEPARTMENT
OFFICIAL BUSINESS

PENALTY FOR PRIVATE USE TO AVOID PAYMENT OF POSTAGE, $300

POSTMARK OF DELIVERING OFFICE

RIVERSIDE CA
OCT 1 1970

INSTRUCTIONS: Show name and address below and complete instructions on other side, where applicable. Moisten gummed ends, attach and hold firmly to back of article. Print on front of article *RETURN RECEIPT REQUESTED.*

RETURN TO

NAME OF SENDER

NORTHROP ELECTRONICS

STREET AND NO. OR P.O. BOX

1 RESEARCH PARK
PALOS VERDES PENINSULA

POST OFFIC ATE, AND ZIP CODE

CALIFORNIA 9 74

Attention: J. M. Simon, Es

POD Form 3811 Apr. 1967

055—16—71548-10

bcc: MESkilling, HERiggins, BETrites, RABalling, Edna Hellmers

30 September 1970

Registered - Return Receipt Requested

Stringfellow Quarry
Post Office Box 6
Riverside, California

Re: Lease Agreement Between Stringfellow Quarry Company and Northrop Corporation dated 1 September 1965

Gentlemen:

Northrop Corporation, Electro-Mechanical Division, hereby exercises its fifth option to extend the lease for an additional period of one year, November 1, 1970 through October 31, 1971.

Very truly yours,

Jerome M. Simon

Jerome M. Simon

JMS:q

TRUCTIONS TO DELIVERING EMPLC

☐ Deliver *ONLY* to addressee

☐ Show address where delivered

(Additional charges required for these services)

RECEIPT

Received the numbered article described on other side.

SIGNATURE OR NAME OF ADDRESSEE *(must always be filled in)*

Stringfellow Const.

SIGNATURE OF ADDRESSEE'S AGENT, IF ANY

Kathleen J Bruscc

DATE DELIVERED

OCT - 9 1969

SHOW WHERE DELIVERED *(only if requested)*

C55—16—71548-5—F GPO

POST OFFICE DEPARTMENT
OFFICIAL BUSINESS

PENALTY FOR PRIVATE USE TO AVOID PAYMENT OF POSTAGE, $300

POSTMARK OF DELIVERING OFFICE

RIVERSIDE CALIF. OCT 9 1969

INSTRUCTIONS: Fill in items below and complete instructions on other side, if applicable. Moisten gummed ends, attach and hold firmly to back of article. Print on front of article RETURN RECEIPT REQUESTED.

RETURN TO

REGISTERED NO.	NAME OF SENDER J. M. Simon-Northrop Corporation
CERTIFIED NO.	STREET AND NO. OR P. O. BOX 1 Research Park
INSURED NO.	CITY, STATE, AND ZIP CODE Palos Verdes, CA 9027

POD Form 3811 Sep. 1963

C55—1848-6—F

cc: DELutz, CWHood, BETrites, RABalling, EHellmers
MESkilling

7 October 1969

Stringfellow Quarry Company
Post Office Box 6
Riverside, California

Re: Lease Agreement Between Stringfellow Quarry Co. and Northrop Corporation dated 1 September 1965

Gentlemen:

On 1 September 1965 Northrop Corporation entered into a lease agreement with your company for a period of one year, November 1, 1965 through October 31, 1966. In addition, this agreement provided certain options per paragraph 3.

In accordance with the aforesaid provisions, Northrop Corporation, now on behalf of its Electro-Mechanical Division (successor to its Nortronics Division) hereby exercises the fourth option to extend the lease for an additional period of one year, November 1, 1969 through October 31, 1970.

Very truly yours,

Jerome M. Simon

JMS:q

Registered - Return Receipt Requested

I RUCTIONS TO DELIVERING EMPLO

☐ Deliver *ONLY* to addressee

☐ Show address where delivered

(Additional charges required for these services)

RECEIPT

Received the numbered article described on other side.

SIGNATURE OR NAME OF ADDRESSEE *(must always be filled in)*

Stringfellow Quarry

SIGNATURE OF ADDRESSEE'S AGENT, IF ANY

H. Rohbacker

DATE DELIVERED	SHOW WHERE DELIVERED *(only if requested)*
SEP 26 1968	

C55—16—71548-5—F GPO

POST OFFICE DEPARTMENT
OFFICIAL BUSINESS

PENALTY FOR PRIVATE USE TO AVOID PAYMENT OF POSTAGE, $300

POSTMARK OF DELIVERING OFFICE

RIVERSIDE CALIF. SEP 26 1968

INSTRUCTIONS: Fill in items below and complete instructions on other side, if applicable. Moisten gummed ends, attach and hold firmly to back of article. Print on front of article RETURN RECEIPT REQUESTED.

RETURN TO

REGISTERED NO.	NAME OF SENDER J. M. Simon-Northrop Nortronics
CERTIFIED NO.	STREET AND NO. OR P. O. BOX 1 Research Park
INSURED NO.	CITY, STATE, AND ZIP CODE Palos Verdes, Calif. 90274

POD Form 3811 Sep. 1963

C55-[illegible]/1548-6-F

24 September 1968

Registered - Return Receipt Requested

Stringfellow Quarry
Post Office Box 6
Riverside, California

Re: Lease Agreement Between Stringfellow Quarry Co. and Northrop Nortronics dated 1 September 1965

Gentlemen:

Northrop Nortronics hereby exercises its third option to extend the lease for an additional period of one year to and including October 31, 1969.

Very truly yours,

Jerome M. Simon
Assistant General Counsel
Northrop Corporation

JMS:q

bcc: C. C. Cilley, C. W. Hood, B. E. Trites,
R. A. Balling, M. E. Skilling, F. Mooring

USPO

INSTRUCTIONS TO DELIVERING EMPLOYEE

☐ Deliver ONLY to addressee ☐ Show address where delivered

(Additional charges required for these services)

RECEIPT

Received the numbered article described on other side.

SIGNATURE OR NAME OF ADDRESSEE *(must always be filled in)*

String fellow Quarry

SIGNATURE OF ADDRESSEE'S AGENT, IF ANY

H. Rohbacher

DATE DELIVERED	SHOW WHERE DELIVERED *(only if requested)*

C55—16—71546-5—F GPO

POST OFFICE DEPARTMENT
OFFICIAL BUSINESS

PENALTY FOR PRIVATE USE TO AVOID PAYMENT OF POSTAGE, $300

POSTMARK OF DELIVERING OFFICE

RIVERSIDE CALIF. SEP 28

INSTRUCTIONS: Fill in items below and complete instructions on other side, if applicable. Moisten gummed ends, attach and hold firmly to back of article. Print on front of article RETURN RECEIPT REQUESTED.

RETURN TO

REGISTERED NO.	NAME OF SENDER J. M. Simon/Northrop Nortron
CERTIFIED NO.	STREET AND NO. OR P. O. BOX 1 Research Park
INSURED NO.	CITY, STATE, AND ZIP CODE Palos Verdes Penin., Cal 027

POD Form 3811 Sep. 1963

C55—16—71548-6—F

25 September 1967

Registered - Return Receipt Requested

Stringfellow Quarry
Post Office Box 6
Riverside, California

Re: Lease Agreement Between Stringfellow Quarry Co. and Northrop Nortronics dated 1 September 1965

Gentlemen:

Northrop Nortronics hereby exercises its second option to extend the lease for an additional period of one year to and including October 31, 1968.

Very truly yours,

Jerome M. Simon

Jerome M. Simon
Assistant General Counsel
Northrop Corporation

JMS/jr

bcc: C. C. Cilley, J. W. Hinchliffe, B. E. Trites, R. A. Balling, M. E. Skilling, F. Mooring

AGREEMENT

The undersigned parties do hereby agree to maintain a buffer zone between their explosives operations at the Stringfellow Quarry Co. in Section 1, Township 2 South, Range 6 West, S.B.B. & M., in order to more efficiently satisfy the quantity-distance requirements of each operation.

The buffer zone shall consist of the property described as follows: Begir \g at the intersection of the east-west midsection line and the east section line of said section; thence northerly along the east section line to a point 2300 feet south of the northeast section corner; thence westerly along a line parallel with the north section line 750 feet; thence southerly along a line parallel to the east section line to a point 200 feet northerly of the east-west midsection line; thence westerly to the existing access road to the acid-alkali dump pits; thence southerly along said access road to the east-west midsection line; thence easterly along the east-west mid-section line to the intersection with the east section line, which is the point of beginning. The buffer zone is shown cross-hatched on the attached sketch, marked EXHIBIT A.

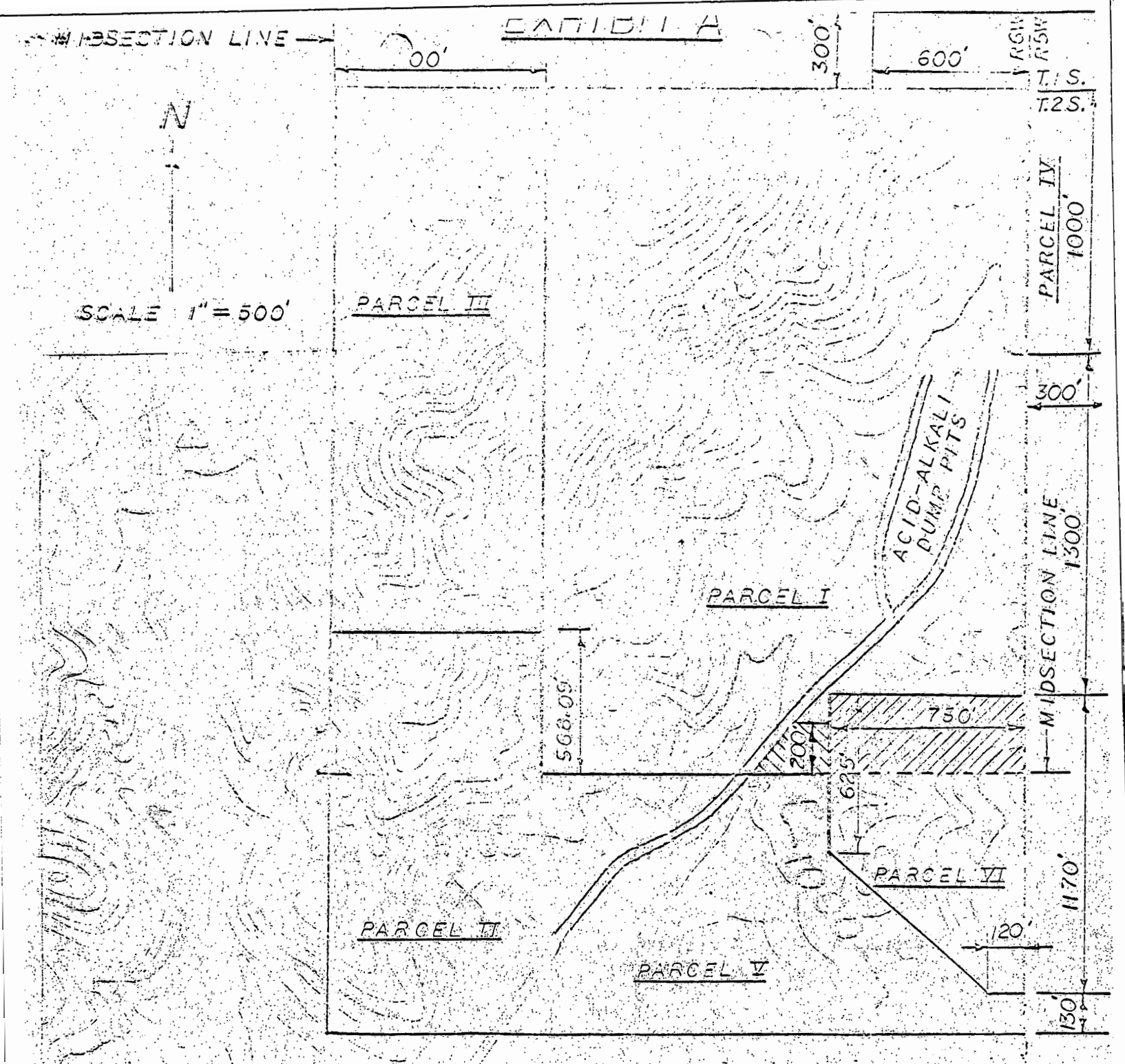
During the period of their respective leases or extensions thereof, each party agrees that it will not construct or allow to be constructed any structure affecting explosives quantity-distance requirements within this buffer zone without first giving thirty days written notice to the other party.

NORTRONICS, A DIVISION OF
NORTHROP CORPORATION

By _____
Frederick Stevens
Vice President and General Manager

UNIVERSAL PROPULSION CO.

By _____
Charles E. Bartley
President



LEGAL DESCRIPTION
PARCEL I

THE NORTHEAST QUARTER OF SECT. 1, RANGE 6 WEST, TOWNSHIP 2 SOUTH, SAN BERNARDINO BASE AND MERIDIAN.

EXCEPTING:

1. THE WESTERLY 800 FT. THEREOF
2. THAT PART OF THE EASTERLY 750 FT. LYING SOUTHERLY OF THE NORTHERLY 2300 FT.

bcc: J. Hinchliffe, B. Ed Trites, R. Balling, M. Skilling, Accounts Payable

25 October 1966

Registered Mail

Stringfellow Quarry
Post Office Box 6
Riverside, California

Re: Lease Agreement Between Stringfellow Quarry Co. and Nortronics, A Division of Northrop Corporation, dated 1 September 1965

Gentlemen:

Nortronics intends to exercise its first option to extend the lease for an additional period of one year to and including October 31, 1967.

Very truly yours,

Robert B. Watts, Jr.
Assistant General Counsel
Northrop Corporation

RBW/jr

10/25/66 approved by Lynch by telecon RBWJr.

10-25-66 OK - Kelley, Hinchliffe and McDonnel not available. [illegible]

approved by Stevens per Maxine RBWJr.

STRINGFELLOW QUARRY
P. O. BOX 6
RIVERSIDE, CALIFORNIA
TEL. OVERLAND 5-5231

March 11, 1966

Northrop Nortronics
500 E. Orangethorpe Ave.
Anaheim, California

Gentlemen:

We herewith grant you a restrictive easement as shown on Exhibit A, Change 1. We will not construct or allow to be constructed any building within the easement during the term of your lease.

Sincerely,

STRINGFELLOW QUARRY CO.

L. E. Nutt

L. E. Nutt, General Partner

LEN:mb

AMENDMENT OF LEASE AGREEMENT

THIS AMENDMENT, made and entered into this 11th day of March, 1966, by and between STRINGFELLOW QUARRY CO. (hereinafter referred to as "Lessor") and NORTRONICS, A DIVISION OF NORTHROP CORPORATION (hereinafter referred to as "Lessee");

WITNESSETH:

In consideration of the mutual covenants herein contained, the Lessor and the Lessee hereby amend that certain Lease Agreement between them dated 1 September 1965 concerning approximately 100 acres of the Stringfellow Quarry, Riverside, California, as follows:

1. Lessee agrees that it will not construct any buildings closer to the southwest corner of its leasehold boundary than those magazines in Parcel I as shown in Exhibit A attached hereto unless first obtaining Lessor's written consent.

2. Lessee agrees to permit Lessor to utilize on a non-interfering basis that portion of the leased property which is located at a point beginning at the south west corner of the leasehold property into the leased property for a radius distance of 100 feet for purposes of developing Lessor's quarry.

3. Lessor agrees for the duration of the Lease that it will not construct or allow to be constructed any building or other structure on Lessor's property adjacent to the south west corner of Lessee's leasehold, as more particularly shown by the red lines on Exhibit A attached hereto.

4. All of the other terms and conditions of said Lease Agreement between the parties remain unchanged.

IN WITNESS WHEREOF, the parties hereto have executed this Amendment as of the day and year first above written.

LESSOR:

STRINGFELLOW QUARRY CO.

By L. E. Nutt

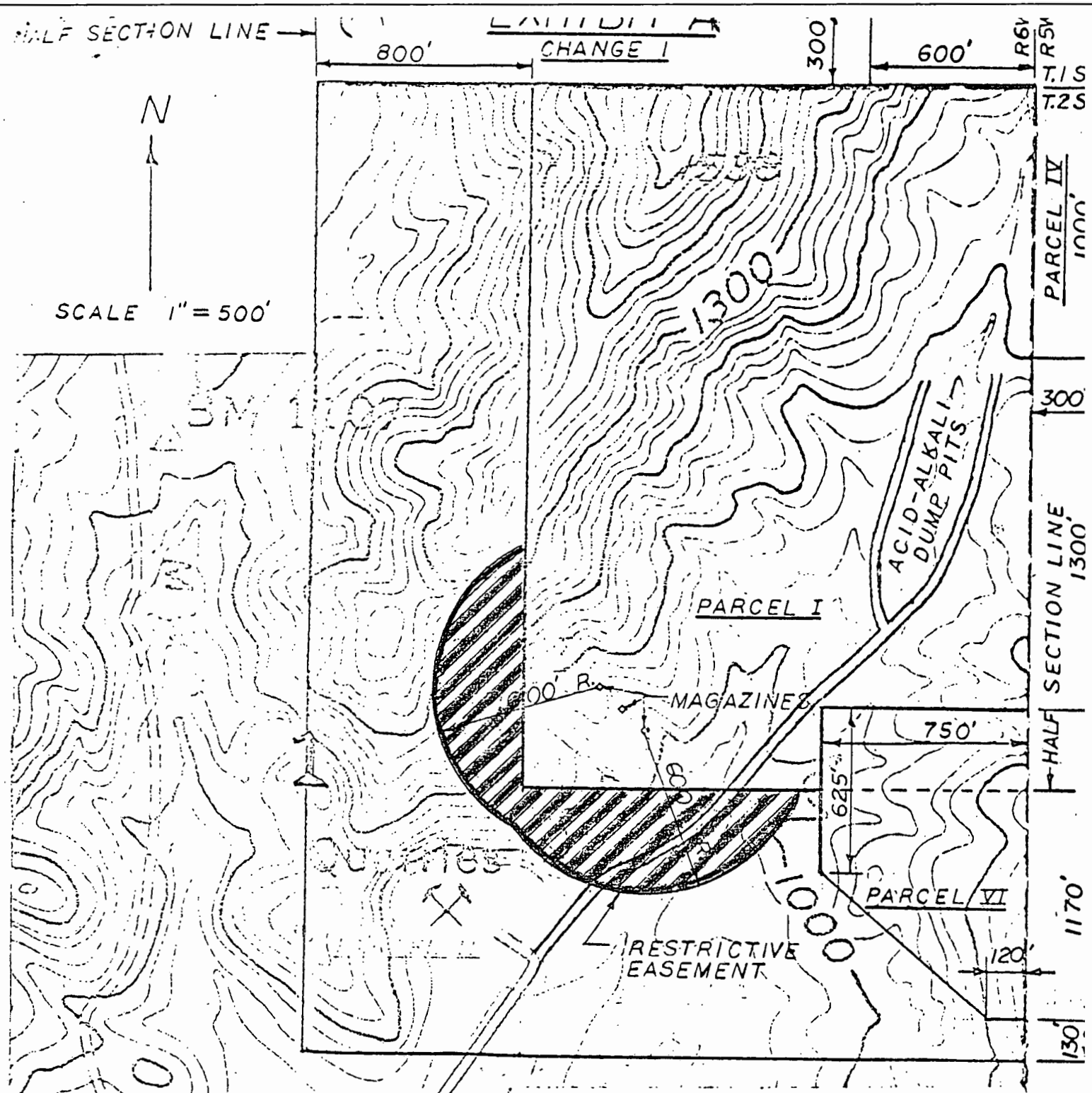
L. E. Nutt
General Partner

LESSEE:

NORTRONICS, A DIVISION OF
NORTHROP CORPORATION

By _____

Frederick Stevens
Vice President and General Manager



LEGAL DESCRIPTION
PARCEL I

THE NORTHEAST QUARTER OF SECT. 1, RANGE 6 WEST, TOWNSHIP 2 SOUTH, SAN BERNARDINO BASE AND MERIDIAN.

EXCEPTING:

1. THE WESTERLY 800 FT. THEREOF.
2. THAT PART OF THE EASTERLY 750 FT. LYING SOUTHERLY OF THE NORTHERLY 2300 FT.

EASEMENT GRANTED:
11 MARCH 1966

STRINGFELLOW QUARRY C

NORTRONICS. 500 EAST ORANGETHORPE AVENUE, ANAHEIM, CALIFORNIA
A DIVISION OF NORTHROP CORPORATION

In reply refer to:
Y6110-6-PE-120

10 March 1966

Stringfellow Quarry Co.
P.O. Box 6
Riverside, California

Attention: Mr. Earl Nutt

Dear Sirs:

As you are aware, the military inspection agencies having jurisdiction over our ordnance operation at the Stringfellow site have imposed the restriction of maintaining quantity-distance from the bounderies of our lease as well as from existing and proposed buildings. The relocation of the magazines to meet this requirement would prevent the development of the site as planned.

In order to prevent this undue occurence, will you grant us a restrictive easement adjacent to the southwest corner of our lease line as indicated on the attached sketch marked Exhibit A, Change 1. The granting of this easement by you means that you will not construct or allow to be constructed any building within the easement during the term of our lease.

We, in turn, agree not to construct any buildings closer to the southwest corner of our lease than the magazines referred to above, so that you may consider that area within our lease for your quantity-distance requirements for your own explosives storage. It is our understanding that you will abide by the quantity-distance requirements of the California Division of Industrial Safety with respect to explosives storage.

In addition, we will allow you to encroach 100 feet from the southwest corner of our leased area in the development of your quarry.

If this meets with your approval, will you please sign one copy of this letter and one copy of Exhibit A. I will have Mr. Bob Watts draw up an amendment to the lease covering these points.

Very truly yours,

Ed Hofmayer
Project Engineer

EH/pm
Attachment

ACCEPTANCE: Earl Nutt
Earl Nutt
for Stringfellow Quarry Co.

STRINGFELLOW QUARRY
P. O. BOX 6
RIVERSIDE, CALIFORNIA
TEL. OVERLAND 5-5231

Aug. 30, 1965

Standard Dredging
Birth 206
Terminal Island, California

Gentlemen:

One of our Lessees, Nortronics, A Division of Northrop Aircraft, Inc., is planning to do some ordinance testing in the northeast corner of our property which is described as the NE $\frac{1}{4}$, Sec. 1, TWP 2 S, R 6 W, SBDM, Riverside County.

You own adjacent property located easterly in Section 6, TWP 2 S, R 6 W, and Government Lot 8, which is located north and east in San Bernardino County. All of the property described herein lies in a box canyon which is inaccessible from three sides, and is composed of rock, sage brush, etc.

Nortronics has been advised by the U. S. Forest Service that while their testing is entirely on Stringfellow Quarry Co. property, it would be advisable to clear a 300 ft. wide firebreak around the test area. As the property owner, we ask your permission for Nortronics, at their expense, to clear the sage brush and debris from the area required to create a suitable firebreak, and to maintain said firebreak until such time as you need the area for development.

Nortronics will pay any and all costs in connection with clearing the firebreak and hold the property owner free and harmless from any and all liabilities in connection therewith.

Sincerely,

STRINGFELLOW QUARRY CO.

L. E. Nutt

L. E. Nutt

PERMISSION GRANTED:

Standard Dredging

By: [illegible]

DATE: 1 September, 1965

Reply to: 6100-72-FMSM-30

3 August 1972

Stringfellow Quarry Company
P.O. Box 6
Riverside, California 92502

Attention: Earl Hatt
Jimmy Stringfellow

Reference: Letter 6100-72-FMSM-24
dated 31 July 1972

Gentlemen:

In accordance with our telephone conversation this date our agreement described in referenced letter is amended as follows:

1. We will abandon the 5-ton Carrier air conditioner on the roof of the Load Assembly Building as a sale to you for $500.00.

2. We will abandon the 1-1/2 ton window air conditioner in the General Utility Building as a sale to you for $100.00.

3. We will abandon the 25KVA Transformer and the 15KVA Transformer described in the referenced letter.

4. In return for the abandonment of the transformers you will pay our share of the land taxes for the period July 1, 1972 until October 31, 1972, whatever they may be. This tax bill is estimated to be $250 - $300 but will not be determined until November, 1972.

Please remit your check for $600.00 to cover the sale of the air conditioners and cash our check for $152.89, which you have received, as our final payment as described in referenced letter.

Very truly yours,

NORTHROP CORPORATION
Electro-Mechanical Division

E. K. Stilling
Chief Plant Engineer

bcc: Boston, Hofmayer, Heidhardt, J. Simon, D. McInnis, R. S. Taylor, File

AUG 2 1972

Northrop Corporation · Electro-Mechanical Division

NORTHROP

100 East Orangethorpe Avenue
Anaheim, California 92801

Reply to: 6100-72-FM&M-24

OK
file

31 July 1972

Stringfellow Quarry Company
P.O. Box 6
Riverside, California 92502

Attention: Earl Nutt
Jimmy Stringfellow

Gentlemen:

According to the terms of our agreement of July 11, 1972, at your office we have attached a list of the property to be abandoned by Northrop. This property includes buildings and appurtenances, including light fixtures, plumbing fixtures, wiring, conduits, piping, etc., and generally does not include any plant equipment, i.e., personal property.

In return for this abandonment you have agreed to reimburse us for two thirds of the unsecured property taxes for the annual period starting July 1, 1972 and ending June 30, 1973.

We will, therefore, deduct from our remaining lease payments of $1200.00 due for the three month period starting 1 August 1972 and ending 31 October 1972, the sum of $1,047.11.

This deduction will include the August and September payments of $400 each with the October payment to be $152.89 instead of $400.

If you need any further information, please contact me at your convenience.

Very truly yours,

NORTHROP CORPORATION
Electro-Mechanical Division

M. E. Skilling

M. E. Skilling
Chief Plant Engineer

Attachments -3

cc: Boston, McInnis, Neidhardt, J. Simon, R. S. Taylor, File

Attachment #1
6100-72-FM&M-24
31 July 1972

PROPERTY TO BE ABANDONED BY NORTHROP

LOAD ASSEMBLY BUILDING

2	Electric duct heaters, one 3KW, one 8KW
18	Steber par-38 lamps
22	Western S3296-SL 8' fixtures
1	Bulldog PL12R panel

GENERAL UTILITY BUILDING

2	Pre-fabricated shower
3	Tank type water closet
3	Lavatory
1	Sanitary sink
1	80 Gallon electric hot water heater
4	Evaporative (swamp) room cooler
3	Chromalux LVH-50 heaters & control
1	24 circuit 120/240V panel
28	2-lamp 430,8' strips
4	2-lamp 430,6' strips
2	Restroom exhaust fans
10	Stonco par-38 fixtures

MELT CAST BUILDING

8	Steber par-38 lamps
6	Receptacles
1	240V, 30A 2P WP SW

TOTAL REPLACEMENT COST: $9,254.

Attachment #2
6100-72-FM&M-24
31 July 1972

PROPERTY TO BE RETURNED TO NORTHROP

LOAD ASSEMBLY BUILDING

1	5-Ton Carrier 50DA006 air cooled roof mounted air conditioner
1	1-1/2 Ton window air conditioning unit
1	15KVA transformer

GENERAL UTILITY BUILDING

1	25KVA transformer
2	Wide light w/photo cell

MELT CAST BUILDING

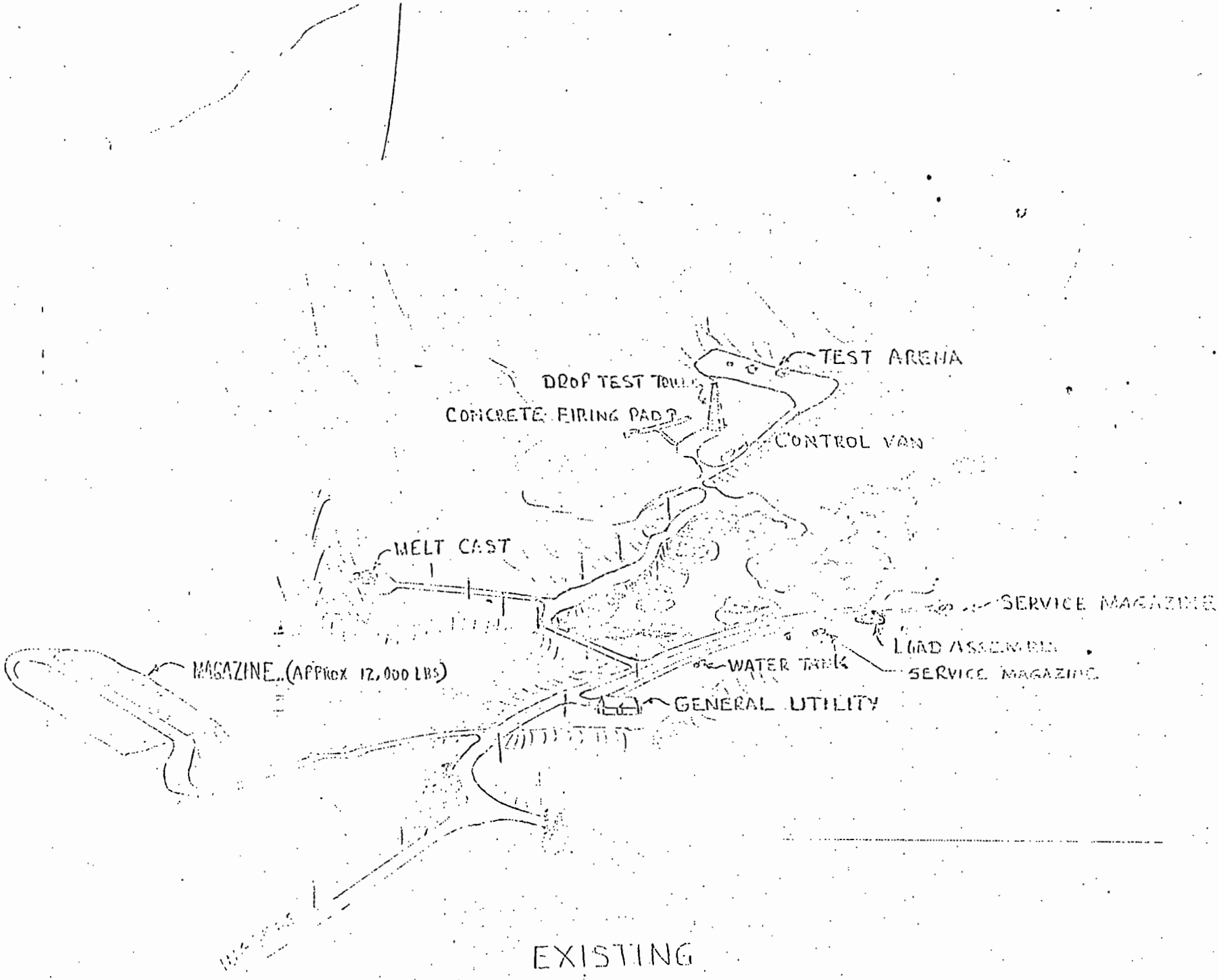
2	Wide light w/photo cell
1	Red light beacon
400'	2/0 TW wire
1	120/240V, 225A main, 100A breaker panel, NAB12-3AB

TEST ARENA

1100'	1-1/2" conduit
3300'	#1 TW wire
1	8-circuit panel
1	Red light system

TOTAL REPLACEMENT COST: $7,408.

Attachment #3
6100-72-FM&M-24
31 July 1972



EXISTING
STRINGFELLOW QUARRY ORDNANCE SITE
RIVERSIDE, CALIF

LEASE AGREEMENT

THIS AGREEMENT, made and entered into this 1st day of September, 1965, by and between STRINGFELLOW QUARRY CO., a partnership, having its principal place of business at Highway 60 and Pyrite Street, Riverside, California (hereinafter referred to as "Lessor") and NORTRONICS, A DIVISION OF NORTHROP CORPORATION, a California corporation, having a principal place of business at 1 Research Park, Palos Verdes Peninsula, California (hereinafter referred to as "Lessee").

WITNESSETH:

In consideration of the rentals hereinafter set forth and the mutual covenants herein contained, the Lessor and the Lessee hereby agree as follows:

1. The Lessor hereby leases to the Lessee and the Lessee hereby leases from the Lessor that real property located north of U. S. Highway Route 60 approximately 6 miles west of the City of Riverside, California, and generally known as the Stringfellow Quarry and consisting of approximately 100 acres, all as more specifically described and shown as Parcel I on Exhibit A, attached hereto and made a part hereof. The Lessor retains the right to operate the existing acid-alkali dump pits in the area as shown on Exhibit A.

2. The Lessee shall have the right to conduct static tests on explosives in the quarry site shown as Parcel II in Exhibit A provided that the tests are coordinated with the Lessor's commercial operations of the quarry. However, in this connection the Lessee shall have the right to construct a fire break along the ridge of said parcel. The Lessor will obtain written permission from the third party presently leasing Parcel III, for the Lessee

to construct a fire break along the ridge in Parcel III, and the Lessor will exert his best efforts to get this third party to share in the expense of the fire break construction between the operations of the Lessee and this third party.

The Lessor will also obtain written permission from the property owners adjacent to the northeast corner of Parcel I, for the Lessee to construct fire breaks in the area shown as Parcel IV.

3. The term of this lease shall be for a period of one (1) year, commencing on the 1st day of November 1965, and extending to and including October 31, 1966. Additionally, the Lessee shall have nine (9) successive options at its sole election to extend the term of this lease for periods of one (1) year each. In the event that the Lessee exercises all of the options to extend this lease as set forth above, then additionally, the Lessee shall have one (1) option at its sole election to extend the term of this lease for a period of five (5) years at the same rental rate and upon the same terms and conditions as set forth herein. Each such successive option to be exercised by the Lessee, if at all, by the Lessee giving written notice to the Lessor of its intention to exercise each option at least thirty (30) days prior to the expiration of the then existing lease term.

4. The Lessee shall pay the Lessor as rental for said real property the sum of $400.00 per month, payable in advance. The Lessee shall forward monthly rental payments to the Lessor at the following address:

Stringfellow Quarry Co.
P. O. Box 6
Riverside, Calif.

5. In the event that the Lessee exercises all of the options to extend this lease as set forth in Article 3 above, then additionally, the Lessee shall have three (3) further successive options to extend the term of the lease for periods of five (5) years each upon the same terms and conditions as set forth herein except that for these periods the rental for this real property shall be $800.00 per month.

6. It is hereby expressly understood and agreed by and between the parties hereto, that if default shall be made in the payment of the rent hereinabove specified to be paid, or any part thereof, or if default shall be made in the performance of any of the covenants or agreements herein contained to be kept and performed by said Lessee it shall be lawful for said Lessor at its option to declare the said term ended and to re-enter the said demised premises or any part thereof, either with or without process of law, and to expel or remove Lessee or any other person or persons who may be upon the same, together with all goods, equipment and chattels found therein, and Lessee hereby waives all right to any notice from Lessor of its election to declare this lease at an end under any of its provisions. All of the remedies provided in this lease or conferred upon Lessor in law or in equity shall be cumulative and are given without impairing any other rights or remedies of Lessor, and Lessee agrees to pay and discharge all costs and expenses, including all reasonable attorney's fees that may be incurred by Lessor in enforcing the covenants of the lease or the rights of Lessor in the premises.

Lessor agrees that the interest of Lessee hereunder shall not be subject to forfeiture for default in the performance of any of the covenants or agreements herein contained to be kept and performed by Lessee until Lessee shall have failed for a period of ten (10) days after written Notice of Default to cure such default. Such Notice of Default shall specify the acts or omissions constituting the default and the provision or paragraph of the lease violated. In the event a default shall occur in the payment of the rent hereinabove specified to be paid, or any part thereof, it is expressly understood and agreed that the provisions of Paragraph 14 hereof shall be applicable. Nothing in this paragraph shall be construed as limiting or waiving in any way Lessee's right to damages for breach or default under any provision.

7. The Lessee agrees to pay any taxes as may be assessed on improvements installed by Lessee and also agrees to pay Lessor for any increases of Lessors real property taxes for Parcel I. The northeast quarter section is

presently one parcel on the tax rolls and the most recent annual tax bill was $137.84.

8. The Lessee agrees to pay before delinquency any and all charges for water, gas, electricity, power or any other utility used in or upon the demised premises during the term of this Lease by the Lessee.

9. The Lessor consents to the Lessee's use of the demised premises for the development, loading and testing of explosive ordnance and tactical weapons systems.

10. The Lessee agrees to maintain a policy of public liability and property damage insurance covering Lessee's activities upon the demised property with a licensed and admitted insuror naming the Lessor herein as an additional insured in a total amount of One Million Dollars ($1,000,000.00). The Lessee agrees to maintain and keep this insurance in effect during the entire term of this Lease and agrees to provide the Lessor with a certificate of such insurance if so requested by the Lessor.

Lessor shall not be responsible or liable for any acts, injury or damage to persons, things or property in or upon the demised premises caused by the act or omission of Lessee, its agents, employees or servants and Lessee agrees to indemnify Lessor and hold it harmless of and free in an amount up to $1,000,000.00 from all claims and demands for injuries to persons or property arising out of the use, misuse, neglect or occupancy of said premises or its appurtenances by Lessee.

Each of the parties hereto hereby releases and waives its rights against the other with respect to all liability arising out of the loss of or damage to improvements or buildings or the contents thereof caused by the negligent act or failure to act of the other party to this lease, of their respective officers, agents and/or employees, and each party, insofar as it has the right to so do, does hereby waive all rights of subrogation of its insurance carriers in connection with such loss or damage. Any new policies of insurance secured by Lessee covering improvements and property erected on and kept upon the demised premises shall be made subject to this provision.

11. The Lessor agrees that during the term of this Lease the Lessee may install either temporary or permanent improvements to the demised premises at the Lessee's sole cost. Upon the termination of the Lease, the Lessee may remove all severable items such as tools, fixtures, machinery, and equipment including items such as air conditioning, and heating equipment. The Lessee may at its option remove buildings, but in this event the Lessor will then have the option to require the Lessee to remove all related improvements to the building as well. The Lessor also consents to the Lessee's making such reasonable pits, trenches, emplacements, testing holes, earth barricades or abutments on the demised premises as may be necessary for the Lessee to conduct ordnance testing in accordance with safe and sound engineering practices.

Lessee agrees to indemnify Lessor and save Lessor harmless from all liens and claims of lien and all other liability, claims and demands arising out of any work done or material supplied to the demised premises at the instance of Lessee, and from all actions, suits and costs of suit instituted by any person to enforce any such lien or claim of lien, liability, claim or demand, together with the costs of suit and reasonable attorney's fees incurred by Lessor in connection therewith. Lessee shall permit Lessor or its agent right of entry, subject to government security regulations governing Lessee's tenancy of the property, to the premises at reasonable times to post notices of non-responsibility for alterations, repairs or construction by Lessee to or on said premises.

However, Lessee, by the terms hereof, acquires no right to extract rock, minerals, or any other substance, whether similar or dissimilar thereto, from the subsurface of the demised premises.

12. The Lessor understands and is aware that in order for the Lessee to utilize the demised premises as an ordnance test site it will be necessary for the Lessee to obtain a conditional use permit from the County of Riverside authorizing this use of this property. The Lessor agrees to assist the Lessee

in obtaining such authorizations, however, the Lessor shall not be put to any cost or expense whatsoever by reason of such action on the part of the Lessee.

13. The Lessee agrees to abide by all laws, rules, regulations or administrative orders with respect to its use of the demised property as may from time to time be promulgated by either state, federal or local authority. However, the Lessor agrees that in the event (i) the Lessee is unable to obtain the conditional use permit from the County of Riverside on a reasonable basis as referred to above or (ii) such permit or variance is subsequently cancelled or is materially altered by the County or (iii) the Lessee is unable to conduct without increased costs its planned programs of ordnance testing because of an adverse determination by either a state, federal or local authority (including for example determinations by appropriate officials that these activities may unduly increase problems of fire hazard or soil erosion), or (iv) if Lessee is enjoined from the planned use of the property by restraining order arising out of lawsuit or threatened lawsuit by private parties, then the Lessee at its election shall have the right to cancel this Lease upon its giving the Lessor written notice to this effect.

14. The Lessor represents that it owns two additional parcels of land, located adjacent to the demised property shown as Parcels V and VI on Exhibit A. Parcel V is presently vacant and unimproved and Lessor is willing to grant to the Lessee a right of first refusal to lease this parcel, should the Lessee so desire. Parcel VI is improved with several buildings and is presently under lease to another party who is using this land for ordnance work. In the event this Parcel VI becomes available for lease, the Lessor also agrees to give the Lessee a right of first refusal to lease this parcel of land. The Lessee shall have 30 days after receipt of notice from Lessor to exercise its right of first refusal on Parcel V and Parcel VI as described in this paragraph.

15. Whenever it shall be necessary or desirable for either party to give any notice to the other with respect to this Lease, such notice shall be sent by registered mail, postage prepaid, addressed as follows:

To the Lessor:

Stringfellow Quarry Co.
P. O. Box 6
Riverside, California

To the Lessee:

Northrop/Nortronics
1 Research Park
Palos Verdes Peninsula, California 90274
Attn: Robert B. Watts, Jr.
Assistant General Counsel

16. The Lessee shall have reasonable and necessary personnel and utility ingress and egress to the demised property over the Lessor's property. So far as Lesse's personnel are concerned, this right of access shall be over the existing road of Lessor or one of similar character should Lessor ever elect to replace this road. With respect to utilities, Lessor agrees to grant such easements to utility companies (in their usual form) as the Lessee reasonably may request in order to support its operations subject, however, to the Lessor's right to approve such easements. This right of approval shall only be exercised by the Lessor to assure it that any such easements will not interfere with the Lessor's quarry operations.

17. This Lease shall be binding upon the heirs, assigns and successors of each of the parties hereto.

IN WITNESS WHEREOF, the parties hereto have executed this Lease Agreement as of the day and year first above written.

LESSOR:

STRINGFELLOW QUARRY CO.

By L E Hutt
General partner

LESSEE:

NORTRONICS, A DIVISION OF
NORTHROP CORPORATION

By
Frederick Stevens
Vice President and General Manager

STATE OF CALIFORNIA)
) ss.
COUNTY OF RIVERSIDE)

On October 19, 1965, before me, the undersigned, a Notary Public in and for the said County and State, personally appeared L. E. Nutt, known to me to be the person who executed the within instrument, on behalf of the partnership therein named and acknowledged to me that such partnership executed the same.

WITNESS my hand and official seal.

Marjorie L. Bridges
Notary Public

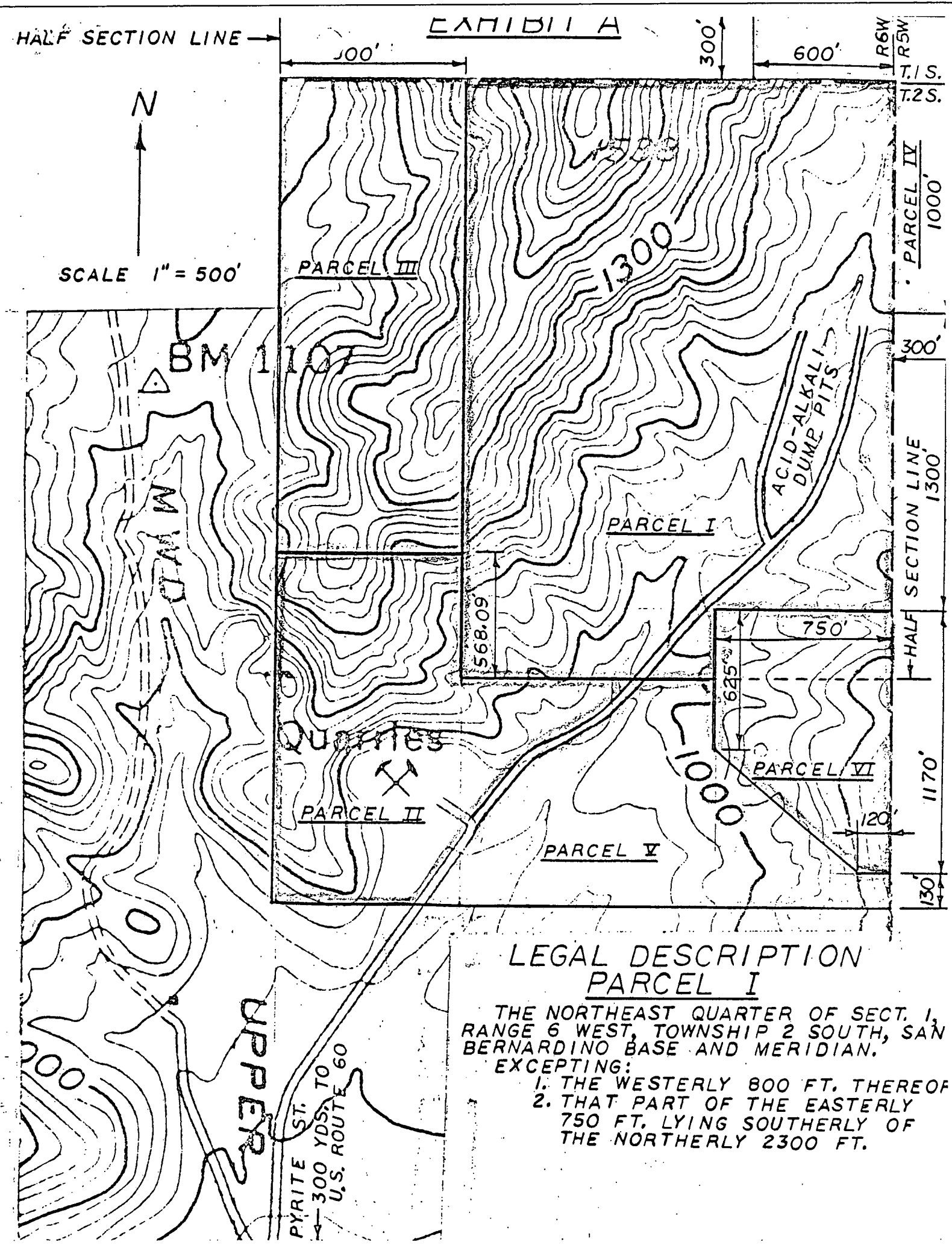
STATE OF CALIFORNIA)
) ss.
COUNTY OF LOS ANGELES)

On 14 October, 1965, before me, the undersigned, a Notary Public in and for the said County and State, personally appeared FREDERICK STEVENS, known to me to be the Vice President and General Manager of Nortronics, a Division of Northrop Corporation, the corporation that executed the within instrument and known to me to be the person who executed the within instrument on behalf of the corporation therein named and acknowledged to me that such corporation executed the same.

WITNESS my hand and official seal.

Maxine H. Lonsdale
Notary Public

My Commission Expires 11 May 1966
MAXINE H. LONSDALE



LEGAL DESCRIPTION
PARCEL I

THE NORTHEAST QUARTER OF SECT. 1, RANGE 6 WEST, TOWNSHIP 2 SOUTH, SAN BERNARDINO BASE AND MERIDIAN.

EXCEPTING:

1. THE WESTERLY 800 FT. THEREOF
2. THAT PART OF THE EASTERLY 750 FT. LYING SOUTHERLY OF THE NORTHERLY 2300 FT.

Total Jant. Env. Chls.
[illegible]
[illegible]
[illegible] Graded
Mulch Flashing
Grid Electrical Design
Voltage Construction
Flashing/C Grade
Dual Ang. Fan. Device

Check Acct.	Dash	Sales Order
963 01		9983

Buyer: T. Garcia

This ETA authorizes the Electro-Mechanical Division to exercise the option to renew the lease term on the Riverside Test Site (Stringfellow Quarry) for an additional period of one (1) year from 1 November 1969 through 31 October 1970 at the same rental rate ($400 per month) and upon the same terms and conditions as specified on the original Lease dated 1 September 1965 as amended by document dated 11 March 1966.

Action required: Assistant General Counsel to renew lease

Total cost: $4,800/year

TOTAL $4,800/yr

Name	Date	Name	Date
R. E. Phillips	9-5-69	R. W. [illegible]	
Contract Budgets	9-5-69	J. M. Simon	
R. J. Lawther	9/11/69	C. C. Miller	
R. L. Gibner	9/1[illegible]	C. W. Hodd	

EQUIPMENT AND FACILITY AUTHORIZATION
FORM NS 1725 (R-12-66) REPLACES 80-17

DATE 8-16-68

☐ ASSET ☒ BURDEN ☐ CONTRACT

EFA NO. 359780	PAGE 1 OF
REQUESTED BY D. A. Mott	ORGN. EXT. 6729-4
REQUEST NO. 961014	DATE 8-12-68
DELIVER TO D. A. Mott	TERM. ORGN
BLDG. & AREA	DATE REQ'D
SKETCH—LAYOUT NO.	INSTALLATION REQUIRED ☐ YES ☒ N
FACILITY ENGR. R. Taylor	PHONE 431
PROJECT/SCHL. NO.	ITEM
CONTRACT NO.	MOD.

JUSTIFICATION

MANDATORY

The Riverside Test Site (Stringfellow Quarry) is required during and subsequent to the forthcoming year for manufacture and testing of high explosive devices which are not permissible at the Anaheim site. These devices are being produced and tested for the following programs:

1. Firm Contracts

71-3239-SC-9505 Quadrant Aimable Charge Warhead
F08635-68-C-0041 SDU-4A/A Flechette W/H Imp.
9985-3765 Persistant Target Marker Add-on
DAAA 15-68-C-0472 Multi-Shot Flame Weapon

See Page 2 for continued justification.

PURCH. ACCT.	DASH	SALES ORDER
LABOR ACCT. 963	01	9993
MATL. ACCT.		

VENDOR | P.O. NUMBER | ☐ FOR RESALE ☐ NOT FOR RESALE | F.O.B. | SHIP TO | SHIP VIA | TERMS | VDR. PROM. DEL. | BUYER | TYPIST S. Garcia | PROP. CONTROL

ITEM	QTY.	DESCRIPTION	PRICE
		This E.F.A. authorizes Nortronics Anaheim Department to exercise its option to renew the lease term on the Riverside Test Site (Stringfellow Quarry) for an additional period of one year from 1 November 1968 thru 31 October 1969 at the same rental rate ($400 per month) and upon the same terms and conditions.	
		Action required:	
		A. Finance Department to obtain Division and corporate approvals.	
		B. Assistant General Counsel to renew lease.	
		Total cost: $4,800/year	
		TOTAL	

M. K. Skilling	DATE	J. W. [illegible]	DATE
Indirect Budgets	DATE 8-21-68	J. M. Simon	DATE
B. Kavin	DATE	D. L. Lewis	DATE
	DATE	C. C. Gilley	DATE

EQUIPMENT AND FACILITY AUTHORIZATION Continuation Sheet
FORM NS 1725A (R 12-66) REPLACES 00-49A

DATE: 8-16-68

EFA NO. 359780

ITEM	QTY.	DESCRIPTION	PRICE
		Justification (cont.)	
		2. Q.T.A.	
		Home 1 7992-3703 Interior Ballistics	
		Home 3 7992-3702 Terminal Ballistics [illegible]	
		Home 4 7992-3705 Terminal Effects Secondary	
		Home 4 9993-3701 Fuzing Development	
		Home 2 9997-3701 U.S. Weapons	
		Home 6 9997-3702 Advanced Aircraft Systems & Mechanical Applications	
		Home 10 9997-3704 Incendiary Munitions Applications	
		Home 13 9997-3705 [illegible] Munitions Applications	
		Home 14 9997-3706 [illegible]	
		Home 15 9997-3707 New Fuzing Applications	

STRINGFELLOW QUARRY
P. O. BOX 6
RIVERSIDE, CALIFORNIA
TEL. OVERLAND 5-5231

January 4, 1968

Nortronics
500 E. Orangethorpe Ave.
Anaheim, California

Attention: Mr. M. E. Skilling, Chief Plant Engineer

Gentlemen:

We are sending the enclosed copy of paid tax bill to you and ask that you direct it to the proper division.

See p. 3, Item 7 of Lease attached Cont.

Under the terms of our lease agreement, dated September 1, 1965, Nortronics, as Lessee, agrees to pay all increases in Lessor's real property tax on the NE$\frac{1}{4}$ Section of property under lease, in excess of $137.84. As shown on the enclosed tax bill the total taxes for the year 1967-68 are in the amount of $789.64. Therefore the excess amount to be paid by Nortronics to Stringfellow Quarry Co. is $651.80.

Sincerely,

STRINGFELLOW QUARRY CO.

L. E. Nutt

L. E. Nutt

LEN:mb

encl. 1

RECEIVED
5 JAN 1968
Facility Engineering

1967-1968 COMBINED LOCAL AGENCY SECURED PROPERTY TAX BILL

PLEASE MAKE CHECKS PAYABLE TO DONNA BOUER BABCOCK, TAX COLLECTOR, COUNTY OF RIVERSIDE, 4TH FLOOR, HEALTH-FINANCE BLDG., 3575 11TH STREET MALL, RIVERSIDE, CALIFORNIA 92501

ASSESSED TO: (ON MARCH 6, 1967) STAINGFELLOW QUARRY — 9003-27125

MAILING ADDRESS: P O BOX 6, RIVERSIDE CALIF

SEE REVERSE SIDE FOR IMPORTANT INFORMATION

DESCRIPTION OF PROPERTY (EXAMINE DESCRIPTION OF YOUR PROPERTY CAREFULLY)

LOTS 1 & 2 & S 1/2 OF NE 1/4 EXC MINERAL RTS ON FORMER RR R/W, 159.92 AC SEC 1 T2S R6W

YOUR CANCELLED CHECK IS YOUR BEST RECEIPT AND PROOF OF PAYMENT. DETACH STUB(S) ON RIGHT SIDE AND MAIL WITH YOUR PAYMENT. IF YOU NEED ADDITIONAL RECEIPT CHECK HERE [ ] AND RETURN ENTIRE TAX BILL WITH YOUR PAYMENT.

FULL CASH VALUE: REAL PROPERTY $ 32520 PERSONAL PROPERTY $ ASSESSMENT RATIO: 25%

SEE ITEM NO. 9 & ITEM NO. 10 ON REVERSE SIDE FOR FURTHER INFORMATION REGARDING CASH VALUES AND ASSESSMENT RATIO

$ LAND	$ IMPROVEMENTS	$ TREES & VINES	$ PERSONAL PROPERTY	$ EXEMPTION	$ TOTAL TAXABLE VALUE	$ CASHIER'S RECEIPT 2ND INSTALLMENT	$ CASHIER'S RECEIPT 1ST INSTALLMENT
8130					8130	394.82 ADD 6% AFTER APR. 10, 1963 AND $3.00 COST	394.82 ADD 6% AFTER DEC. 31, 1967

Paid 12-6-67

RECEIVED 5 JAN 1968 Engineering

ASSESSMENT NUMBER	CODE AREA	PARCEL NUMBER	TAX RATE PER $100.00	$	$
	99-14	07-25-000-02	$ 9.7129	394.82	394.82

DISTRIBUTION OF TAXES & ASSESSMENTS

COUNTY	CITY	EDUCATION	SPECIAL DISTRICTS	OTHER ITEMS	TOTAL TAXES & ASSESSMENTS
186.48		434.83	168.33		$ 789.64

SEE ITEM NO. 1 ON REVERSE SIDE FOR FURTHER INFORMATION REGARDING THIS DISTRIBUTION

9/6/67 - copies to: C. C. Cilley

NORTHROP NORTRONICS
A DIVISION OF NORTHROP CORPORATION
MEMORANDUM

In Reply Refer To: 6110-7-IE-85

To: D. R. Lewis, [illegible]

From: F. W. Lynch

Subject: [illegible]

Date: 23 August 1967

Copies: Gilmey, Minchliffe, Ricketts
Stevens, Watts, File

Ref:

Please obtain approval for the Nortronics Anaheim Department to exercise its option to extend the lease term on the subject land for an additional period of one year at the same rental rate ($600 per month) and upon the same terms and conditions.

The term of the renewal of this lease is for a period of one year, commencing on the first day of November, 1967, and extending to and including October 31, 1968. Additionally, the Company has seven successive options at its sole election to extend the term of the lease for periods of one year each. If all one year options are exercised, the Company shall have one further option to extend the lease at the same rental rate and upon the same terms and conditions for five years. If all previous options are exercised, the Company shall have three further successive options to extend the lease for periods of five years each but at a rental rate of $800.00 per month.

Attached is a description of the property and the justification for renewal of the lease.

M. E. Shilling, Chief Plant Engineer
Industrial Engineering Group
Y6110 - Ext. 1201

Approved: F. W. Lynch
Vice President and Manager
Anaheim Department

HFD/[illegible]:cg

Attachment

Attachment 1
23 August 1967

Description of Property and Justification for Renewal of Lease - Stringfellow Quarry

A. Description of Property:

Real property located north of U. S. Highway Route 60 approximately six miles west of the City of Riverside, California, and generally known as the Stringfellow Quarry and consisting of approximately 100 acres.

B. Justification:

The Riverside Test Site (Stringfellow Quarry) is required during and subsequent to the forthcoming year for manufacture and testing of high explosive devices which are not permissible at the Anaheim site. These devices are being produced and tested on the following programs:

1. Firm Contracts

AF08(635)-5797 Incendiary Bomb
F08(635)-67-C-0129 Anti-Personnel/Anti-Materiel Mechanism
DAAA15-67-C-0[illegible] Multi Shot Flame Weapon
F08(635)-67-C-0027 Anti-Materiel [illegible]
F08(635)-67-C-0[illegible] Modified Flechette
F08(635)-67-C-0103 Quadrant Amicable Charge
F08(635)-67-C-0[illegible] Exercise Munitions

2. Company sponsored OTA Programs

OTA 9982-3701 Sintered metal carrier
OTA 9982-3702 Flight Ballistics - [illegible]
OTA 9982-3703 Terminal Ballistics - Explosive
OTA 9982-3705 Terminal Ballistics - Incendiary C/B
OTA 9982-3706 Special Projectile
OTA 9987-3701 Tactical Systems
OTA 9987-3702 C/B dissemination
OTA 9987-3703 Guns and Munitions
OTA 9987-3707 Warhead techniques
OTA 9987-3708 Fire/Incendiary bomb investigation

3. Programmed and Potential business:

Planning Support Multi Shop Weapon - BPI 9977-5213 Items 1A & 1B
Incendiary bomb (Dropped on)

In view of the contractual and programmed activity necessitating use of the Stringfellow Quarry, it is recommended that the lease be renewed.

in reply refer to: Y6110-6-PE-194

NORTHROP NORTRONICS

inter-office memorandum

to: D. L. Lewis

from: M. E. Skilling

subject: LEASEHOLD IMPROVEMENTS - RIVERSIDE TEST SITE

date: 4 August 1966

copies: F. Lynch
R. Watts
File

ref: 6110-6-IE-154
Dated 20 May 1966

6110-6-IE-170
Dated 14 June 1966

The attached proposal from the Stringfellow Quarry indicates some tax problems and reticence to proceed with the program. The net result is a monthly rental rate of $35.65 per $1,000 of construction costs amortized in three years. A rental cost of $400 per month would then continue after the improvements were amortized.

The Page lease, as a comparison, provides leasehold improvements at a monthly rental rate of $30.277 per $1,000 of construction costs amortized in three years. No rent is charged after the improvements are amortized.

Please advise no later than 15 August 1966, the maximum rental rate that would be acceptable to Northrop Corporation. Further discussions can then be held with the Stringfellow Quarry.

M. E. Skilling, Chief Plant Engineer
Industrial Engineering Group
6110 - Ext. 701

MES/pm
Attachment

STRINGFELLOW QUARRY
P. O. BOX 6
RIVERSIDE, CALIFORNIA
TEL. OVERLAND 5-5231

RECEIVED
8 JUL 1966
Facility Engineering

July 7, 1966

Nortronics
500 E. Orangethorpe Avenue
Anaheim, California

Ref.: Y6110-6-1E-170

Attention: Mr. M. E. Skilling, Chief Plant Engineer

Gentlemen:

We are sorry to take so long to answer your letter of June 14, 1966, pertaining to proposed improvements to Stringfellow-Nortronics leased property at Stringfellow Quarry, Riverside, California.

It has taken longer than previously anticipated to get answers from our accountants and attorneys regarding the tax situation that might be imposed on Stringfellow Quarry Co. under this building improvement program. Even at this late date the answers we received are not conclusive.

It has been suggested by both our accountants and attorneys that Stringfellow Quarry Co. would probably be in a more favorable position for a fast depreciation write off on these improvements if a new lease for a three year period was entered into on the improvements only, instead of amending the original land lease and including the improvements therein. It was suggested that a new lease would more clearly indicate a special situation on the improvements and allow the faster write off, which is not uncommon in government sponsored ordinance work.

In your letter of June 14, you stated that Nortronics would expect to pay the property taxes on the improvements and that the Lessor should assume the cost for insurance; however, it seems it would be better for all concerned if Nortronics would carry insurance on the buildings and improvements with certificates of coverage issued to Stringfellow Quarry Co., because it is almost impossible for us to get an insurance rate without knowing the types and amounts of explosives to be kept on hand, the different types of use of the facilities, and other risks which would govern said insurance rates.

The Stringfellow Quarry Co. would provide the monies, totaling $85,900,

to build and construct the improvements as proposed in your letter of June 14, and would enter into a three year lease with options to be determined under final negotiations. Said lease would contain a clause that in the event Nortronics terminates said lease prior to the end of its three year term, that Nortronics would guarantee full payment of all sums which would have become due and payable during the three year period. The rate per $1,000 of construction cost as requested in your letter would be $35.65 per month. Extensions to this lease after the three year period would be at the rate of $400 per month.

Sincerely,

STRINGFELLOW QUARRY CO.

L. E. Nutt

L. E. Nutt

LEN:mb

file/ [illegible] Lease

NORTRONICS. 500 EAST ORANGETHORPE AVENUE, ANAHEIM, CALIFORNIA

A DIVISION OF NORTHROP CORPORATION

In reply refer to:
Y6110-6-IE-170

14 June 1966

JUN 15 1966
LEGAL DEPT.

Mr. L. E. Nutt
Stringfellow Quarry Co.
P. O. Box 6
Riverside, California

Dear Mr. Nutt:

We are interested in renegotiating our lease with you for our Remote Ordnance Test Site to have you construct $85,000 to $100,000 worth of non-severable leasehold improvements during the period from August, 1966, to August, 1967, and for you to increase the rent to us over a period of approximately three years after which the rent would return to that provided in the existing lease.

It would be preferable to have the lease period and options provided in the existing lease remain the same, with a clause covering a lump sum payment that would become due if the options to renew were not exercised during the period of increased rent.

The proposed improvements with the estimated cost is as follows:

Test Building	$15,000
Explosive Melt and Cast Building	3,000
Loading and Assembly Building	10,000
Operation Building for Aerosol Chamber	10,000
Explosive Magazine (1)	3,000
General Utility Building	10,000
Roads, Fencing, Power, Water, Sewer, etc.	34,900
Total . . .	$85,900

Nortronics would provide working drawings and specifications for the improvements and would require the right to name a minimum of two general contractors to bid on the complete job or two specialty contractors to bid on various phases of the work as the case may be. Nortronics would also provide inspection during construction.

Nortronics would expect to pay to the lessor the property taxes on the improvements, but the lessor would assume the cost for insurance and include it within the rental rate.

Would you please provide us with a proposal indicating the rental rate you would charge per $1,000 of construction costs, based on the above information. The rental would then be based on final construction costs. Include in your proposal any changes or additions to the existing lease that would be required by you.

This request for you to submit a proposal to us covering a renegotiation of our lease for our Remote Ordnance Site does not constitute a commitment on the part of this organization nor of Northrop Corporation that it will renegotiate said lease. Consequently, the expense of your proposal effort or for any other anticipatory cost that you may incur in connection with this proposed transaction will be at your risk. Furthermore, although various representatives of our company may discuss or negotiate the terms of a proposed definitive lease agreement with you, such actions will only be of a preliminary nature undertaken by such representatives solely for the purpose of facilitating Northrop's evaluation of your proposal. Northrop shall neither assume nor incur any liabilities in connection with this proposed transaction until and only if the Vice President and General Manager of Northrop's Nortronics Division shall have executed a definitive amendment to lease agreement with you covering the property under discussion.

Very truly yours,

M. E. Skilling
Chief Plant Engineer

MES/pm

cc: D. Lewis
F. Lynch
R. Watts

29 March 1966

Mr. Earl Nutt
Stringfellow Quarry Co.
P. O. Box 6
Riverside, California

Dear Earl:

Again, many thanks for your able help and assistance at the Use Permit hearing some few months back. It was a real pleasure to meet you and I shall look forward to another working session with you to discuss business of one sort or another at "The Office".

Enclosed are five copies of a formal Amendment to the Lease covering the various items that were agreed upon in Ed Hofmayer's letter of 10 March.

If this is all in order, I would appreciate your sending me back at least three fully signed copies.

Thanks.

Regards,

Robert B. Watts, Jr.
Assistant General Counsel
Northrop Corporation

cc: Ed Hofmayer

CC's of Amendment sent 3/31/66
to: Skilling accounting
Hofmayer
Hinchliffe
Balling
Trites

DOCUMENT DESCRIPTION:

Amendment of Lease Agreement

Stringfellow Quarry Co.

(No cost amendment negotiated to satisfy Government ordnance safety requirements)

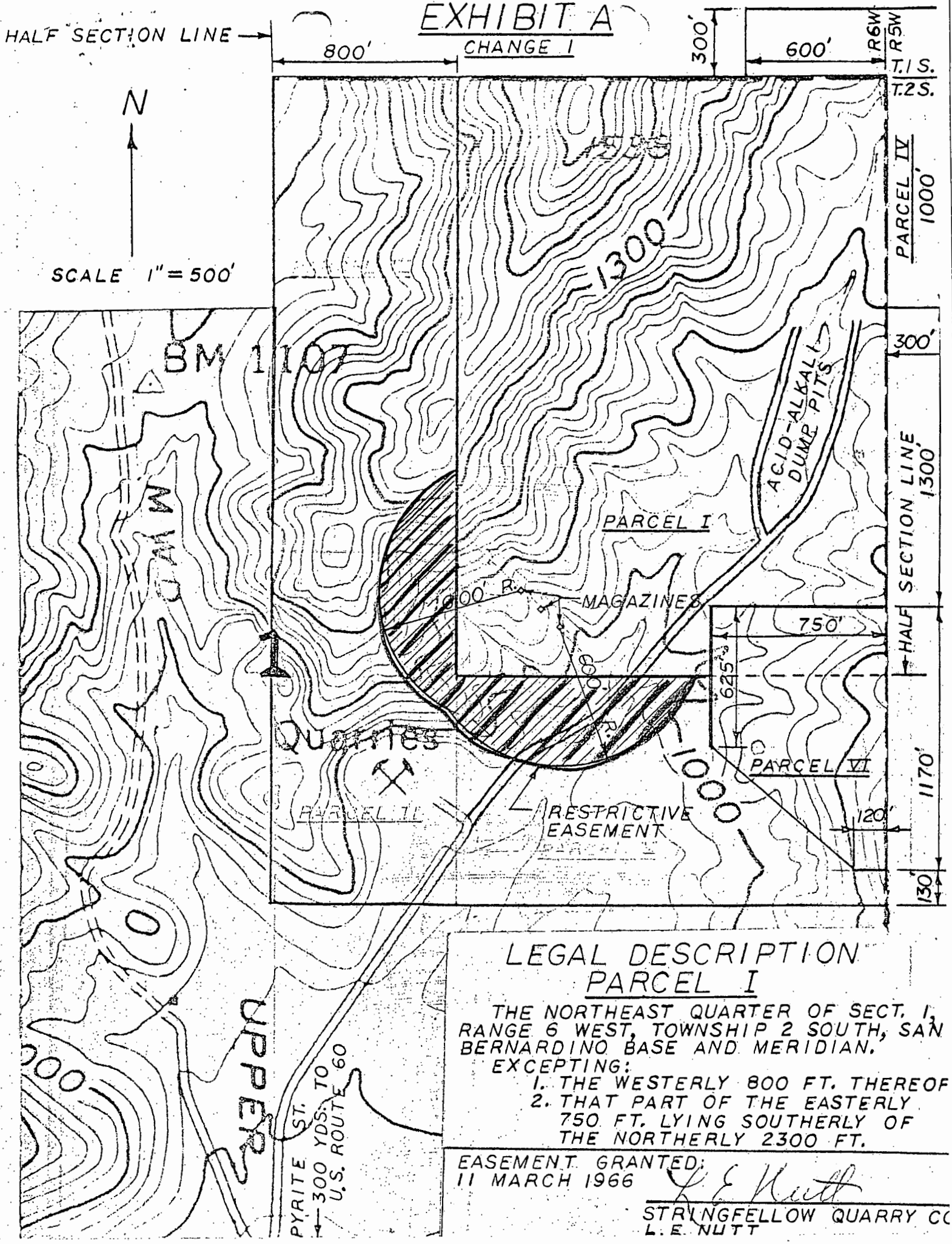
Dated: 11 March 1966

RECEIVED
MAR 22 1966
NORTRONICS DIVISION

APPROVALS:		Date
Originator	(see attached memo) Ed Hofmayer/Plant Engr.	3/14/66
Legal (Nortronics)	Burdett Jr.	3/22/66
Treasurer	[illegible]	3-22-66
VP & GM	L. P. Stevens (see amendment)	3-28-66
Corporate	Not required Burdett	

EXHIBIT A

CHANGE 1



LEGAL DESCRIPTION
PARCEL I

THE NORTHEAST QUARTER OF SECT. 1, RANGE 6 WEST, TOWNSHIP 2 SOUTH, SAN BERNARDINO BASE AND MERIDIAN.

EXCEPTING:

1. THE WESTERLY 800 FT. THEREOF
2. THAT PART OF THE EASTERLY 750 FT. LYING SOUTHERLY OF THE NORTHERLY 2300 FT.

EASEMENT GRANTED:
11 MARCH 1966

L. E. Nutt

STRINGFELLOW QUARRY CO
L. E. NUTT

STRINGFELLOW QUARRY
P. O. BOX 6
RIVERSIDE, CALIFORNIA
TEL. OVERLAND 5-5231

file

Oct. 27, 1965

Northrop Nortronics
1 Research Park
Palos Verdes Peninsula, Calif.

Attention: Mr. Robert B. Watts, Jr.

Gentlemen:

We are enclosing herewith the original agreement from Standard Dredging and McCormick-Selph, giving permission to Nortronics to make a firebreak on their respective properties.

The agreement from Moromarco, Inc., as called for in the lease between Northrop Nortronics and Stringfellow Quarry Co., has not been received. From the telephone conversation I assume that Northrop Nortronics has initiated the agreement direct with Moromarco, Inc.

Sincerely,

STRINGFELLOW QUARRY CO.

L. E. Nutt

L. E. Nutt

LEN:mb

RECEIVED
OCT 28 1965
DIVISION COUNSEL
130

STRINGFELLOW QUARRY
P. O. BOX 6
RIVERSIDE, CALIFORNIA
TEL. OVERLAND 5-5231

Oct. 19, 1965

June
make usual distributions

J. Mitchell
E. Pritts
R. Balling
accounting
M. Shilling

Northrop Nortronics
1 Research Park
Palos Verdes Peninsula, Calif.

Attention: Mr. Robert B. Watts, Jr.

Gentlemen:

We are enclosing herewith the executed copies of Lease Agreement and the copies of the previous agreement, which were signed only by your people, so that you may destroy them.

Sincerely,

STRINGFELLOW QUARRY CO.

L. E. Nutt

L. E. Nutt

LEN:mb

15 October 1965

Stringfellow Quarry Company
Post Office Box 6
Riverside, California 92502

Gentlemen:

Enclosed are the original and four copies of the Lease Agreement rewritten in accordance with your suggestions.

If this now properly reflects our understandings, I would appreciate it if you would return three fully executed copies of this Agreement to my attention.

Thank you for your cooperation.

Very truly yours,

Robert B. Watts, Jr.
Assistant General Counsel
Northrop Corporation

RBW:jb

cc: Ed. Hofmayer

Encs.

NORTHROP NORTRONICS

A Division of Northrop Corporati

1 Research Park, Palos Verdes Peninsula, California 90

7 October 1965

Moramarco, Inc.
16258 Jurupa
Fontana, California

Gentlemen:

Please refer to Mr. L. E. Nutt's letter to you dated August 31, 1965 and your reply dated September 20, 1965.

Nortronics, a Division of Northrop Corporation, agrees to assume any and all costs in connection with clearing and maintaining the firebreak and to hold Moramarco, Inc. free and harmless from any and all liabilities in connection therewith.

Nortronics further agrees that in case of fire caused by its activities, it will at its own cost re-establish ground cover by seeding to prevent soil erosion by rains. In the event an equivalent cover is not established before rains occur, it will also repair all damage caused by water run off at its own cost.

If these agreements cover your understanding of this matter, please indicate in the space provided below your approval to permit Nortronics to create and maintain this firebreak and then return a signed copy of this letter to Mr. Nutt and another to the undersigned.

Thank you.

Reviewed & approved
JM Nutt Oct 12 65

Very truly yours,

Robert B. Watts, Jr.
Assistant General Counsel
Northrop Corporation

Permission granted:
Moramarco, Inc.
By: _____
Date: _____

STRONG FELLOW HAS REQUESTED THAT THE TERMS OF THE LEASE BE ONE YEAR RENEWABLE BY NORTRONICS ANNUALLY, FOR A TOTAL PERIOD OF TEN YEARS & THEN RENEWABLE FOR FIVE YEAR PERIODS UP TO A TOTAL OF 30 YEARS OVERALL.
ABOVE TWO ITEMS APPROVED.

(1)

Moramarco Inc.

16220 JURUPA AVENUE
FONTANA, CALIFORNIA

Sept. 20, 1965

Stringfellow Quarry
P. O. Box 6
Riverside, Calif.

Attention: Mr. L. E. Nutt

Dear Sir:

Reference to your letter August 31, 1965 requesting permission to make and maintane a suitable windbreak as required by the U. S. Forest Service on our property.

We are willing to grant this permission providing Nortronics the leasing organization in case of fire caused by them will re-establish cover by seeding to prevent run-off by rains. Also if cover is not established before the rains, they will repair all damages by run off water, all at their own time and expenses.

Also we wish to call your attention to the site where Aero-Jet was located on your property. Very much grading was done, there is excessive run off when it rains. It has done damage in our vineyards. We would like your cooperation in making diversion ditches or dams, to prevent any more damage.

Yours truly

Moramarco Inc.

M. Moramarco

1 September 1965

Stringfellow Quarry Co.
P. O. Box 6
Riverside, California

Gentlemen:

Enclosed are five copies of a definitive lease agreement between Northrop Corporation and Stringfellow Quarry Co. embodying the terms and conditions which I understand have been discussed with you by our facilities people.

If this agreement accurately reflects your understandings with respect to this property please have a partner execute three copies of this agreement and return them to my attention. In connection with this it will also be necessary for an acknowledgment of this execution to be made by a notary public.

Should you have any questions with respect to this lease please do not hesitate to call me.

Very truly yours,

Robert B. Watts, Jr.
Assistant General Counsel
Northrop Corporation

RBW:jb

Encs: 5

A Division of Northrop Corpora

NORTHROP NORTRONICS

500 East Orangethorpe Avenue, Anaheim, Calif., 92

6790-6-OSC-74/DRP:ih

2 February 1966

Universal Propulsion Company
P.O. Box 546
Riverside, California

Attention: Frank Marion

Dear Sir:

This letter is submitted to confirm an inquiry made by our Mr. B. W. Morris in November of 1965 regarding access to your property located at 300 Pyrite Street, Riverside, California. Your property adjoins a test site leased by Nortronics, A Division of Northrop Corporation.

Nortronics is planning to conduct an evaluation of a small spray system by dispensing water containing a dye which will aid in determining the spray droplet size. The system to be evaluated dispenses a maximum of fifty (50) gallons of liquid and we anticipate a maximum of five (5) dispensations a day for one (1) or two (2) days per week over a period of two (2) or three (3) months. The results of each group of runs are evaluated prior to the beginning of the next series; hence, the intermittency of the schedule.

Nortronics would like to dispense the spray from an area beyond your explosive mix plant. The spray would be dispensed only when the prevailing wind will carry the spray over the Nortronics' leased site upon which measuring devices will be installed.

The equipment we would bring on your site will be a pickup truck and a four-wheel trailer. We would like to leave the trailer at your site at our risk during the test period. Our field crews are experienced in working at remote sites, with cognizant supervision, and with all aspects of safety and public relations.

Please consider this a request for your approval permitting Nortronics the right of access and regress to use your site in the manner described above. Nortronics would like to initiate the testing on 21 February 1965. Your assistance will be greatly appreciated.

Very truly yours,

NORTRONICS
A Division of Northrop Corporation

D. R. Porter
Contract Administrator
Ordnance Systems Contracts

3 Feb 66

You are welcome to pass through our plant, at your own risk, to do your tests, and to leave your trucks at our plant. If we may assist you in any way, let us know.

Very truly Yours
Frank Marion

A Division of Northrop Corporat

NORTHROP NORTRONICS

Research Park, Palos Verdes Estates, Califor

7 October 1965

Moramarco, Inc.
16258 Jurupa
Fontana, California

Gentlemen:

Please refer to Mr. L. E. Nutt's letter to you dated August 31, 1965 and your reply dated September 20, 1965.

Nortronics, a Division of Northrop Corporation, agrees to assume any and all costs in connection with clearing and maintaining the firebreak and to hold Moramarco, Inc. free and harmless from any and all liabilities in connection therewith.

Nortronics further agrees that in case of fire caused by its activities, it will at its own cost re-establish ground cover by seeding to prevent soil erosion by rains. In the event an equivalent cover is not established before rains occur, it will also repair all damage caused by water run off at its own cost.

If these agreements cover your understanding of this matter, please indicate in the space provided below your approval to permit Nortronics to create and maintain this firebreak and then return a signed copy of this letter to Mr. Nutt and another to the undersigned.

Thank you.

Very truly yours,

Robert B. Watts, Jr.
Assistant General Counsel
Northrop Corporation

Persmission granted:
Moramarco, Inc.
By: John A. Moramarco
Date: Oct 10 1965

In reply refer to: T110-65-97

NORTHROP NORTRONICS

inter-office memorandum

to: Robert S. Tucker

from: R. B. Watts, Jr.

subject: REMOTE ORDNANCE TEST SITE

date: 11 August 1965

copies:

ref:

On August 4 Merrill Skilling sent you a justification package concerning a new test site that Nortronics wants to lease in the vicinity of Riverside.

Mr. Stevens generally concurs with Nortronics' need to lease this site, however, before he makes a final decision in this matter, he would like to have the benefit of your thoughts and comments on the subject.

As usual, time is of the essence. Consequently, it would be most helpful if we could have your review and comments concerning this proposed lease as soon as possible.

I am advised by Mr. Skilling that the owners now indicate that we may be able to obtain this property on the terms and conditions as set forth in the attached preliminary draft.

Robert B. Watts, Jr.
Assistant General Counsel
Northrop Corporation

RBW:jb

Enc.

cc: F. Stevens
F. Lynch
J. Ricketts
M. Skilling

LEASE AGREEMENT

THIS AGREEMENT, made and entered into this _____ day of _____, 1965, by and between _____, a _____, having its principal place of business at _____ (hereinafter referred to as "Lessor") and NORTRONICS, A DIVISION OF NORTHROP CORPORATION, a California corporation, having a principal place of business at 1 Research Park, Palos Verdes Peninsula, California (hereafter referred to as "Lessee").

WITNESSETH:

In consideration of the rentals hereinafter set forth and the mutual covenants herein contained, the Lessor and the Lessee hereby agree as follows:

1. The Lessor hereby leases to the Lessee and the Lessee hereby leases from the Lessor that real property located along U.S. Highway Route 60 approximately 6 miles west of the City of Riverside, California, and generally known as the Springfellow Quary and consisting of approximately 104 acres, all as more specifically described and defined in Exhibit A, attached hereto and made a part hereof.

2. The term of this Lease shall be for one (1) year, beginning on _____, ____, 1965 and extending to and including _____, ____, 1966. Additionally, the Lessee shall have fourteen (14) successive options at its sole election to extend the term of this Lease for periods of one (1)

year each, at the same rental rate and upon the same terms and conditions as set forth herein. Each such successive option to be exercised by the Lessee, if at all, by the Lessee giving written notice to the Lessor of its intention to exercise each option at least thirty (30) days prior to the expiration of the then existing lease term.

3. The Lessee shall pay the Lessor as rental for said real property the sum of $400.00 per month, payable in advance. The Lessee shall forward monthly rental payments to the Lessor at the following address:

_____

_____

_____

4. In the event that the Lessee exercises all of the options to extend this Lease as set forth in Article 2 above, then additionally, the Lessee shall have fifteen (15) further successive options to extend the term of the Lease for periods of one (1) year each upon the same terms and conditions as set forth herein except that for these periods the rental for this real property shall be $800.00 per month.

5. The Lessee agrees to pay before delinquency any and all charges for water, gas, electricity, power or any other utility used in or upon the demised premises during the term of this Lease by the Lessee.

6. The Lessor consents to the Lessee's use of the demised premises for the purpose of conducting tests of ordnance weapons.

7. The Lessee agrees to maintain a policy of public liability and property damage insurance with a licensed and admitted insuror naming the Lessor herein as an additional insured in a total amount of One Million Dollars ($1,000,000.00). The Lessee agrees to maintain and keep this insurance in effect during the entire term of this Lease and agrees to provide the Lessor with a certificate of such insurance if so requested by the Lessor.

8. The Lessor agrees that during the term of this Lease the Lessee may install either temporary or permanent improvements to the demised premises at the Lessee's sole cost. Upon the termination of the Lease, the Lessee agrees either to restore the demised property substantially to its condition prior to the term of the Lease or to leave such improvements on the demised property, in which event all such improvements shall become the sole and exclusive property of the Lessor. The Lessor also consents to the Lessee's making such reasonable pits, trenches, emplacements, testing holes, earth barricades or abutments on the demised premises as may be necessary for the Lessee to conduct ordnance testing in accordance with safe and sound engineering practices.

9. The Lessor understands and is aware that in order for the Lessee to utilize the demised premises as an ordnance test site it will be necessary for the Lessee to obtain a conditional use permit or a zone variance from the ~~City~~ County of Riverside authorizing this use

of this property. The Lessor agrees to assist the Lessee in obtaining such authorizations, however, the Lessor shall not be put to any cost or expense whatsoever by reason of such action on the part of the Lessee.

10. The Lessee agrees to abide by all laws, rules, regulations or administrative orders with respect to its use of the demised property as may from time to time be promulgated by either state, federal or local authority. However, the Lessor agrees that in the event (i) the Lessee is unable to obtain the conditional use permit or zone variance from the County of Riverside on a reasonable basis as referred to above or (ii) such permit or variance is subsequently cancelled or is materially altered by the County or (iii) the Lessee is unable to conduct without increased costs its planned programs of ordnance testing because of an adverse determination by either a state, federal or local authority (including for example determinations by appropriate officials that these activities may unduly increase problems of fire hazard or soil erosion), then the Lessee at its election shall have the right to cancel this Lease upon its giving the Lessor written notice to this effect.

11. The Lessor represents that it owns two additional parcels of land, comprising approximately twenty-five (25) acres each, located adjacent to the demised property. One of these parcels is presently vacant and unimproved and Lessor is willing to grant to the Lessee a right of first refusal to lease this parcel ~~by~~ or substantially

the same terms and conditions as contained herein, at a proportional rental rate, should the Lessee so desire. The second parcel is improved with several buildings and is presently under lease to a third party who is using this land for ordnance work. In the event this parcel becomes available for lease to the Lessee the Lessor also agrees to give the Lessee a right of first refusal to lease this parcel of land on the same basis as set forth above.

12. Whenever it shall be necessary or desirable for either party to give any notice to the other with respect to this Lease, such notice shall be sent by registered mail, postage prepaid, addressed as follows:

To the Lessor:

_____

_____

_____

To the Lessee:

Northrop/Nortronics
1 Research Park
Palos Verdes Peninsula, California 90274
Attn: Robert B. Watts, Jr.
Assistant General Counsel

13. This Lease shall be binding upon the heirs, assigns and successors of each of the parties hereto.

IN WITNESS WHEREOF, the parties hereto have executed this Lease Agreement as of the day and year first above written.

LESSOR:

_____

By_____

LESSEE:

NORTRONICS, A DIVISION OF
NORTHROP CORPORATION

By_____
Frederick Stevens
Vice President and General Manager

STATE OF CALIFORNIA)
) ss.
COUNTY OF_____)

On _____, before me, the undersigned, a Notary Public in and for the said County and State, personally appeared _____, known to me to be the person who executed the within instrument, on behalf of the _____ therein named and acknowledged to me that such_____ executed the same.

WITNESS my hand and official seal.

_____
Notary Public

STATE OF CALIFORNIA)
) ss.
COUNTY OF LOS ANGELES)

On _____, before me, the undersigned, a Notary Public in and for the said County and State, personally appeared FREDERICK STEVENS, known to me to be the Vice President and General Manager of Nortronics, a Division of Northrop Corporation, the corporation that executed the within instrument and known to me to be the person who executed the within instrument on behalf of the corporation therein named and acknowledged to me that such corporation executed the same.

WITNESS my hand and official seal.

_____
Notary Public

In reply refer to:

NORTHROP NORTRONICS

inter-office memorandum

to: R. E. Watts, Division Counsel

from: J. C. Joerger

subject: NORTRONICS' REMOTE TEST SITE

date: 4 August 1965

copies: F. Lynch
M. Skilling
R. Tucker
File

ref:

The attached documents contain information associated with Nortronics' acquisition of a remote ordnance test site.

It is requested that you obtain corporate approval for future lease discussions. Will you please advise M. E. Skilling, Chief Plant Engineer, upon obtaining corporate approval, so that Mr. Skilling can arrange with you for joint meetings with the Riverside Planning Commission and with the Stringfellow interests.

It is further requested that the Stringfellow lease cover a minimum period of five years with an option to renew for an additional five years, at a maximum cost of $10,000 per year. Northrop Corporation should retain the right to cancel at the end of three years.

This office will be available should additional information or assistance be required.

Joerg

J. C. Joerger, Director
Ordnance Systems Section
Y6700 - Ext. 1032

APPROVED: F. W. Lynch, Vice President
Operations Department
Y6000 - Ext. 201

In reply refer to: Y6110-5-IE-173

NORTHROP NORTRONICS

inter-office memorandum

to: R. Watts, Division Counsel

from: M. E. Skilling

subject: REMOTE ORDNANCE SITE

date: 11 August 1965

copies: J. Joerger
F. Lynch
R. Tucker
File

ref: Remote Facility Plan, dated 28 July 1965

Preliminary lease discussions for a remote ordnance site have been held with Mr. L. E. (Earl) Nutt, Stringfellow Quarry Company, P. O. Box 6, Riverside, California (telephone: OVerland 5-5231). Mr. Nutt's office is at the Riverside quarry just north of Highway 60 on Pyrite Street.

The boundaries of the proposed lease are shown in orange on the attached sketch; the legal description of the property is as follows:

The northeast quarter of Section 1, Range 6 West, Township 2 South, San Bernardino Base and Meridian.

Excepting: The westerly 800 feet thereof

Also excepting: That part of the easterly 750 feet lying southerly of the northerly 2,300 feet

In addition, Nortronics would have use of the quarry site (coordinated with the quarry operation) for static tests.

Stringfellow Quarry Company would retain the right to operate the acid and alkali dump pits located in the general area shown on the attached sketch.

The property is available for lease to Nortronics on an annual basis for $400.00 per month, with options to renew annually on the same terms for a total period of fifteen (15) years. Nortronics would also have the option to renew annually for an additional fifteen (15) years for $800.00 per month for the period from the 16th through the 30th year.

In addition, Nortronics would have the right of first refusal to lease two (2) additional parcels of approximately 25 acres each, shown as Parcel 1 and Parcel 2 on the attached sketch. Parcel 1 is presently vacant and unimproved. Parcel 2 is improved with several small buildings and is presently leased. The right of first refusal to lease Parcel 2 would become valid only if the present lessee gave up his lease.

At the expiration of the lease, improvements such as tools, fixtures, machinery, and equipment including such items as air conditioning, heating equipment, etc., may be removed at the option of the lessee. Buildings may also be removed at the option of the lessee, but the lessor would then have the option to request that the complete improvement, including foundation, also be removed.

The lessee is to pay taxes on improvements and on any increase in evaluation of the land. The northeast quarter section is presently one parcel on the tax rolls and the most recent annual tax bill was $137.84.

The lease is cancellable by Nortronics if, for any reason, we are prevented from using the property as indicated, by action of governmental agency or by restraining orders arising out of lawsuit by private parties.

Nortronics intends to use the premises for the development, testing, and loading in pilot quantities for military programs in explosive ordnance, delivery systems, and tactical weapons systems.

Lessee agrees to hold harmless the Lessor on any actions brought by third parties due to actions of lessee. Likewise, lessor agrees to hold harmless the lessee on any actions brought by third parties due to actions of lessor.

We are instituting action for a Conditional Use Permit (which we will coordinate with you), covering all foreseeable uses for the property. Preliminary discussions with the staff of the Riverside Planning Commission indicate that this Permit action cannot be completed prior to 11 October 1965. However, we have scheduled lease negotiations to be completed on 27 August 1965. The Ordnance Section intends to use the site for test firing as soon as the lease is signed. Test firing may be performed legally under the present zoning. However, the lease should be cancellable if the Conditional Use Permit is not obtained covering all items requested in the application.

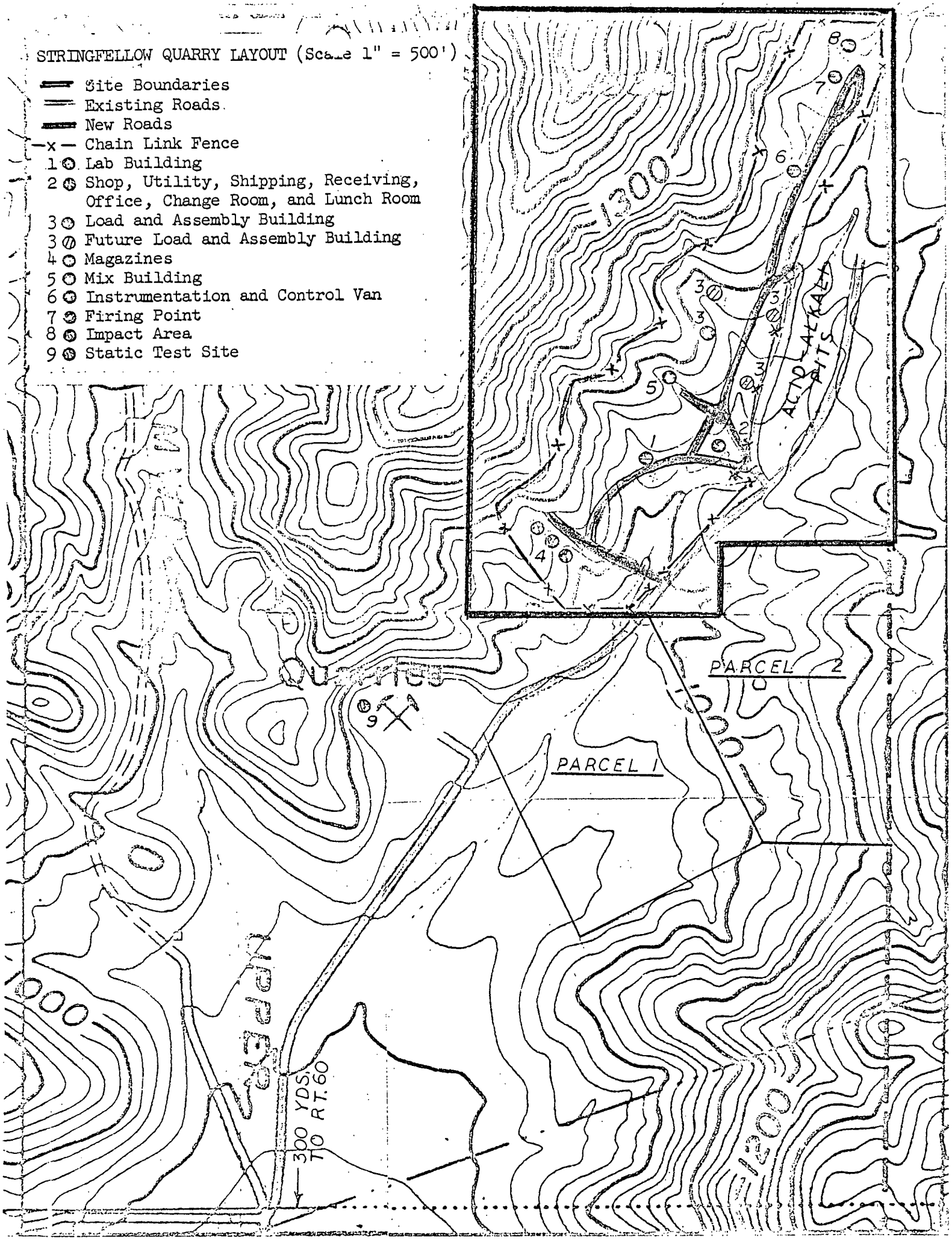
It is requested that you expedite the lease negotiations to meet the above schedule.

M. E. Skilling, Chief Plant Engineer
Industrial Engineering Group
Y6110 - Ext. 701

MES/pm
Attachment

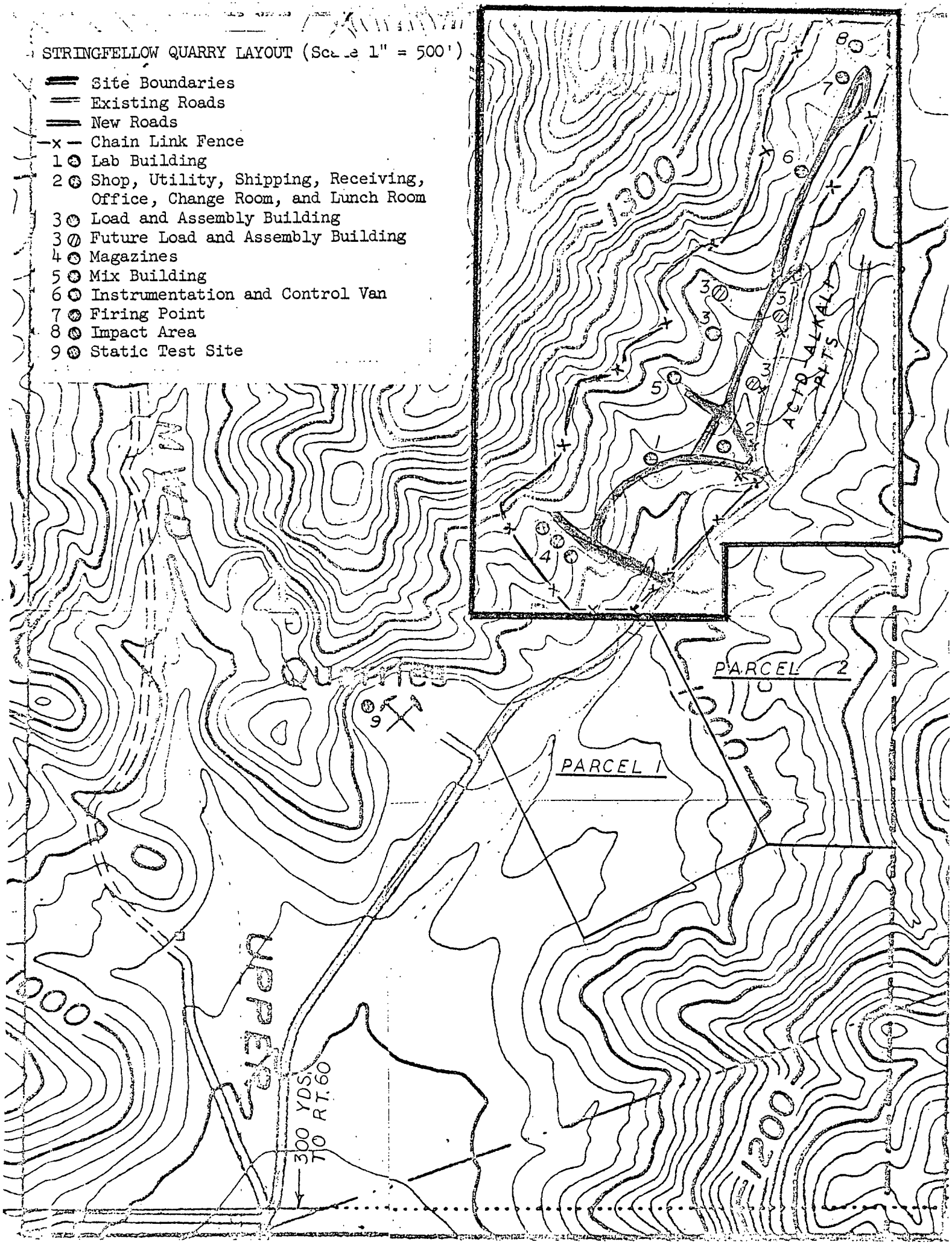
STRINGFELLOW QUARRY LAYOUT (Scale 1" = 500')

- Site Boundaries
- Existing Roads
- New Roads
- —x— Chain Link Fence
- 1 Lab Building
- 2 Shop, Utility, Shipping, Receiving, Office, Change Room, and Lunch Room
- 3 Load and Assembly Building
- 3 Future Load and Assembly Building
- 4 Magazines
- 5 Mix Building
- 6 Instrumentation and Control Van
- 7 Firing Point
- 8 Impact Area
- 9 Static Test Site



STRINGFELLOW QUARRY LAYOUT (Scale 1" = 500')

- Site Boundaries
- Existing Roads
- New Roads
- Chain Link Fence
- 1 Lab Building
- 2 Shop, Utility, Shipping, Receiving, Office, Change Room, and Lunch Room
- 3 Load and Assembly Building
- 3 Future Load and Assembly Building
- 4 Magazines
- 5 Mix Building
- 6 Instrumentation and Control Van
- 7 Firing Point
- 8 Impact Area
- 9 Static Test Site



in reply refer to: 122-104-65

NORTHROP CORPORATION inter-office memorandum

to: R. Watts

from: R. S. Tucker

subject: Remote Ordnance Test Site

date: 17 August 1965

copies: R. Nolan, F. Lynch, F. Stevens, J. Ricketts, M. Skilling

RECEIVED
AUG 23 1965
DIVISION COUNSEL
130

Upon returning from vacation yesterday I reviewed the documents pertaining to the proposed lease of an additional remote ordnance test site. I am aware of the several past attempts to obtain a single site suitable for this purpose and I understand from Merrill Skilling that the currently proposed site, together with the Camp Irwin site, will make it possible to carry out the various types of development and test activities contemplated. I also understand that the marketing outlook in the ordnance field is sufficiently promising as to fully justify the rather modest commitment arising from the lease of the proposed site and the contemplated improvements. I also have been informed that a successful outcome of our negotiations with Amcel would not alter our need for this site, at least not in the near future. Accordingly, I see no reason to do other than to support the current proposal.

In regard to the draft agreement which you submitted as an attachment to your 11 August memo, I have three comments, one substantial and two in the "nits and lice" department:

(1) Paragraph 8 outlines the agreement regarding the removal or transfer of ownership of improvements on the leased property. It discusses these improvements as a package, i.e., it implies that <u>all</u> such improvements will either be wholly removed or left to become the property of the lessor. It is my understanding, or at least it is my suggestion, that at the time of termination of our lease we might wish to remove one or more of our improvements, leaving the balance for the lessor. I therefore suggest that this paragraph provide that each improvement which we elect to remove will be removed in its entirety but that a decision to remove one improvement will not necessitate the removal of all.

✓ Accomplished

in reply refer to: 122-104-65

NORTHROP CORPORATION

inter-office memorandum

to: R. Watts

from: R. S. Tucker

subject: Remote Ordnance Test Site

date: 17 August 1965

copies:

ref:

(2) In the second category of comments, I believe the spelling in Paragraph 1 should be Stringfellow rather than Springfellow. In Paragraph 6 I suggest that "ordnance devices" might be preferable to the present "ordnance weapons," since the latter, at least in common usage, is redundant. However, as an old user of "ordnance weapons" I will be happy to be guided by your superior judgment in this matter.

I am returning the draft lease agreement herewith.

R. S. Tucker

RST/jr

Enclosure

In reply refer to: T110-65-103

NORTHROP NORTRONICS

inter-office memorandum

to: Ed Hofmayer

from: R. B. Watts, Jr.

subject: LEASE AGREEMENT/STRINGFELLOW QUARRY CO.

date: 1 September 1965

Robert Tucker

copies:

ref:

Enclosed are five copies of a definitive lease agreement for the ordnance test site which have been executed by Mr. Stevens. This agreement incorporates all of the suggestions that we received from Mr. Tucker.

Please attach copies of Exhibit A to each agreement. As soon as this is accomplished I will leave it up to you to transmit these documents to the Stringfellow Quarry people for their review and execution. To assist you in this regard I have enclosed a transmittal cover letter.

As soon as this agreement is executed by the owners and three copies are returned to my attention, I will immediately effect the necessary internal Corporate distributions.

Would you please assume responsibility for seeing that this agreement is executed by the owners. In this connection you might point out to the Stringfellow people that if they insist on any changes to this agreement we may run into some delays because Mr. Stevens left yesterday and will not return to the office for approximately four weeks.

Robert B. Watts, Jr.
Assistant General Counsel
Northrop Corporation

Encs.

Aug. 31, 1965

Moramarco, Inc.
16258 Jurupa
Fontana, Calif.

Gentlemen:

One of our Lessees, Nortronics, A Division of Northrop Aircraft, Inc., is planning to do some ordinance testing in the northeast corner of our property which is described as the NE $\frac{1}{4}$, Sec. 1, TWP 2 S, R 6 W, SBBM, Riverside County, Calif.

You own adjacent property located northerly in Section 36, TWP 1 S, R 6 W, in San Bernardino County. All of the property described herein lies in a box canyon which is inaccessible from three sides (North, East, and West), and is composed of rock, sage brush, etc.

Nortronics has been advised by the U. S. Forest Service that while their testing is entirely on Stringfellow Quarry Co. property, it would be advisable to clear a 300 ft. wide firebreak around the test area. As the property owner, we ask your permission for Nortronics, at their expense, to clear the sage brush and debris from the area required to create a suitable firebreak, and to maintain said firebreak until such time as you need the area for development.

Nortronics will pay any and all costs in connection with clearing the firebreak and hold the property owner free and harmless from any and all liabilities in connection therewith.

Sincerely,

STRINGFELLOW QUARRY CO.

_____
L. E. Nutt

LEN:mb

PERMISSION GRANTED:

Moramarco, Inc.

By:_____

DATE:_____

In reply refer to: Y6110-5-PE-255

NORTHROP NORTRONICS

inter-office memorandum

to: R. B. Watts, Jr.

from: E. Hofmayer

subject: LEASE AGREEMENT/STRINGFELLOW QUARRY CO.

date: 4 October 1965

copies: Skilling, File

ref:

Enclosed are copies of letters from Stringfellow Quarry Co. to Moramarco, Inc. and reply to same, pertaining to permission for Nortronics to clear a firebreak on the Moramarco property. Moramarco owns the property north of the Stringfellow property which is part of Parcel IV in the lease.

As per our telephone conversation today, will you write a letter to Moramarco accepting the conditions imposed by them and forward the letter to Stringfellow for transmission by them to Moramarco.

I have talked with Earl Nutt of Stringfellow since speaking with you and he does wish to insert a couple of additional clauses in the lease. Either he or his attorney will contact you shortly.

He suggested dating the lease 1 November, but that in his cover letter he would grant permission to use the quarry prior to that time for test firings.

Ed Hofmayer

Ed Hofmayer
Plant Engineering Unit
Y6110/Y40 - Ext. 431

EH/ob
Attachments (2)

in reply refer to: T110-65-124

NORTHROP NORTRONICS

inter-office memorandum

Orgn. Y6110/Y40

to: Attn: E. I. Hofmayer

from: Robert B. Watts, Jr.

subject: MORAMARCO, INC. AGREEMENT

date: 7 October 1965

copies: File

ref:

Enclosed is the letter you requested in your 4 October memorandum to me.

Please obtain Mr. Lynch's approval of this commitment. If he is willing to assume this obligation, which I am sure he is, you can then transmit my letter to Moramarco.

In order that my file will be complete, please return a copy initialed by Mr. Lynch.

Robert B. Watts, Jr.
Assistant General Counsel
Northrop Corporation

Attachment

in reply refer to: T110-65-128

NORTHROP NORTRONICS inter-office memorandum

to: Frederick Stevens

from: R. B. Watts, Jr.

subject: ORDNANCE TEST SITE LE ASE

date: 13 October 1965

copies:

ref:

It is requested that you execute the attached Lease Agreement with the Stringfellow Quarry Company which covers the test site required by the Anaheim Ordnance Group.

Attached is the buck sheet covering the earlier lease agreement form which you signed last month. This was not accepted by the Lessors.

The only substantive change in this new agreement is the term. Instead of having a one year lease with 14 1-year options we now have a one year lease with only 9 successive 1-year options which term is then followed by 3 successive 5-year options.

This is consistent with our requirements and the ground rules as established by Frank Lynch.

The other changes to the agreement are legal in nature and are completely acceptable so far as I am concerned.

Robert B. Watts, Jr.

Encs.

in reply refer to: Y6110-6-PE-121

NORTHROP CORPORATION

inter-office memorandum

to: R. Watts, T110/T20

from: E. I. Hofmayer

subject: AMENDMENT TO LEASE FOR STRINGFELLOW PROPERTY

date: 14 March 1966

copies: F. Merrell
M. Skilling
File

ref:

It is requested that you amend the lease for the Stringfellow property that we are using as a Remote Ordnance Site as per our telephone conversation and as per my letter to Stringfellow, dated 10 March 1966, and Exhibit A, Change 1, copies of which are attached.

Also enclosed, for information only, is a copy of a letter from Stringfellow granting the restrictive easement. We plan to use the letter and Exhibit A, Change 1, in our submission to the military for their approval of the site.

E. I. Hofmayer

Ed Hofmayer
Plant Engineering Unit
Y6110/Y40 - Ext. 431

EH/pm
Attachments (3)

OCT 31 '66

in reply refer to:

NORTHROP NORTRONICS

inter-office memorandum

to: Mr. R. B. Watts

from: F. W. Lynch

subject: STRINGFELLOW QUARRY LEASE

date: 26 October 1966

copies: M. E. Skilling

ref:

Please take action to renew subject lease for one year starting 1 November 1966 at the prescribed rate of $400/month.

F. W. Lynch

In reply refer to: T110-114-67

NORTHROP

inter-office memorandum

to: M. E. Skilling

from: R. B. Watts, Jr.

subject: See Below

date: 1 August 1967

copies:

ref:

Subject: Lease agreement dated 1 September 1965 between Nortronics and Stringfellow Quarry Co. for use of approximately 100 acres near Riverside California, for use as a test site, at a rental rate of $400 per month.

The current term of subject lease expires on 31 October 1967. However, Nortronics has an option to extend the lease term for an additional period of one (1) year at the same rental rate ($400 per month) and upon the same terms and conditions.

If the Nortronics Anaheim Department desires to exercise this option, please take action to comply with Nortronics SPP 3-8 so that we can obtain in a timely fashion the necessary Corporate approvals as required by CEB No. 49 and inform the Lessor prior to 30 September 1967.

Robert B. Watts, Jr.
Assistant General Counsel
Northrop Corporation

RBW/jr

SEP 7 1967

In reply refer to: T110-117-67

NORTHROP NORTRONICS

inter-office memorandum

to: D. L. Lewis

from: R. B. Watts, Jr.

subject: See Below

date: 6 September 1967

copies: C. C. Cilley, J. W. Hinchliffe

ref:

Subject: Lease agreement dated 1 September 1965 between Nortronics and Stringfellow Quarry Co. for use of approximately 100 acres near Riverside, California, for use as a test site, at a rental rate of $400 per month.

Subject lease expires on 31 October 1967. However, Nortronics has an option to extend the lease term for an additional period of one (1) year at the same rental rate ($400 per month) and upon the same terms and conditions.

Since the Nortronics Anaheim Department has a continuing need for use of this test site (see attached memorandum), I would appreciate an indication of your approval by your signing and returning the original copy of this memorandum to my office so that action can be taken to exercise said option for renewal prior to 30 September 1967.

Robert B. Watts, Jr. (gc)
Robert B. Watts, Jr.
Assistant General Counsel
Northrop Corporation

Attachment

Approved:

D. L. Lewis, Treasurer
Nortronics Division

C. C. Cilley
Corporate Treasurer

In reply refer to: T110-68-99

NORTHROP NORTRONICS

inter-office memorandum

to: D. L. Lewis

from: Jerome M. Simon

subject: See Below

date: 9 September 1968

copies: C. C. Cilley, J. W. Hinchliffe

ref:

Subject: Lease agreement dated 1 September 1965 between Nortronics and Stringfellow Quarry Co. for use of approximately 100 acres near Riverside, California, for use as a test site, at a rental rate of $400 per month.

Subject lease expires on 31 October 1968. However, Nortronics has an option to extend the lease term for an additional period of one (1) year at the same rental rate($400 per month) and upon the same terms and conditions.

Since the Nortronics Anaheim Department has a continuing need for use of this test site (see attached EFA), I would appreciate an indication of your approval by your signing and returning the original copy of this memorandum to my office so that action can be taken to exercise said option for renewal prior to 30 September 1968.

Jerome M. Simon
Division Counsel

Attachment

APPROVED:

D. L. Lewis, Vice President and
Manager, Finance Department
Nortronics Division

C. C. Cilley
Corporate Treasurer

in reply refer to: Y6110-6-IE-154

NORTHROP NORTRONICS

inter-office memorandum
SYSTEMS SUPPORT DEPARTMENT

to: R. B. Watts
D. L. Lewis

from: M. E. Skilling

subject: RENEGOTIATION OF REMOTE ORDNANCE SITE LEASE WITH STRINGFELLOW QUARRY CO.

date: 20 May 1966

copies: J. Joerger
File

ref: Lease Agreement with Stringfellow Quarry Co.

Approval is requested for further discussions leading to a renegotiation of the Lease Agreement with Stringfellow Quarry Co. to have the lessor construct $85,000 to $100,000 worth of non-severable leasehold improvements during FY-67, and to increase the rent to Nortronics to the extent that the improvements would be paid for over a period of approximately three years.

Initial discussions have been conducted with Mr. Earl Nutt of the Stringfellow Quarry Co. and he has expressed interest in this plan provided the details can be worked out. He has determined that his bank would be interested in the financing if the loan were at a flexible interest rate, 1-1/2% above the discount rate, with a minimum of 6-1/2%. The present discount rate is 5-1/2%.

The attached lists show the Ordnance Systems' FY-67 requirements and the proposed manner of financing them.

The attached sketch shows the proposed location on the site of the FY-67 requirements (numbered as per attached list) along with the following installations scheduled for FY-66.

1. Magazines (3)
2. Firing Pad
3. Drop Tower

This office will be available should additional information be required.

M. E. Skilling, Chief Plant Engineer
Industrial Engineering Group
Y6110 - Ext. 701

MAY 26 1966
LEGAL DEPT.

APPROVED: F. W. Lynch
Vice President & Manager
Operations Department

MES/pm
Attachments

Issued by:

Industrial Engineering
17 May 1966

ORDNANCE SYSTEMS - 6700

FY-67 REQUIREMENTS

Burden Items

4.	Firing Buttment	$ 4,000
	Grading and Utilities, etc.	10,000
5.	Guard House	500
6.	Test Arena	3,000
	Lighting	5,000
	Total Burden:	$22,500

Leasehold Improvement
Charge to Rent

7.	Test Building	$15,000
8.	Explosive Meltcast Building	3,000
9.	Loading and Assembly Building	10,000
10.	Operation Building for Aerosol	10,000
11.	Explosive Magazine (1)	3,000
	Leasehold Improvements (roads, fencing, power, water, sewers, etc.)	34,900
12.	General Utility Building	10,000
	Total Leasehold Improvements:	$85,900

Equipment to be Leased

Trailer

Chemical Toilets

Fork Lift

Pick-up Truck & Dozier Blade

Issued by:

Industrial Engineering
17 May 1966

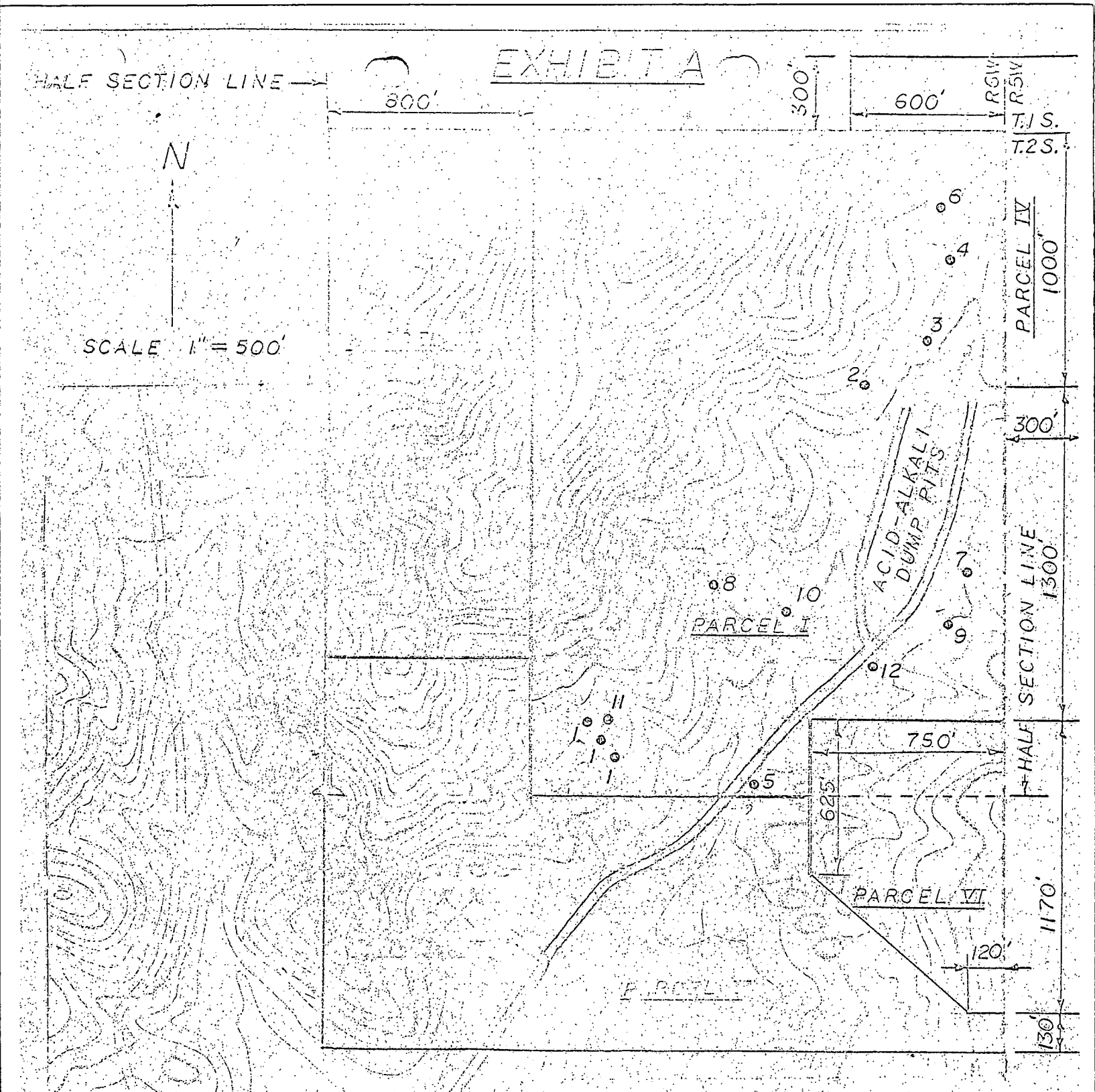
ORDNANCE SYSTEMS - 6700

FY-67 REQUIREMENTS

Capital Asset Items

Balance Box - 6 Channel	$ 1,200
Programmer - 10 Channel Agostat Mod 2900	1,480
Pressure Gages, Copper Crush Aberdeen D&PS	2,000
Radiometer - Barnes Industrial Model R-401	5,700
X-Ray Unit	9,000
Oven (Curing)	400
Vacuum Pump	250
Vacuum Oven	485
Jolt Jumble Tester	4,000
Centrifuge	6,600
Shock Test Machine	8,200
Oven - Infra-red	400
Tableting Press	8,000
Vacuum Pumps (2)	700
Maint. equipment (Drill Press, Lathe, Saw, etc.)	4,358
Hoist - 2 ton	1,700
Transportainers (2)	1,600
Communication System	1,200
Building for Jolt Jumble	1,300
Aerosol Chamber	20,000
Area Lighting	
Laboratory equipment	6,850
Air Compressor (2)	7,000
Transit	700
Misc. (Installation and material)	7,000
Total Asset:	$ 100,123

EXHIBIT A



LEGAL DESCRIPTION
PARCEL I

THE NORTHEAST QUARTER OF SECT. 1, RANGE 6 WEST, TOWNSHIP 2 SOUTH, SAN BERNARDINO BASE AND MERIDIAN.

EXCEPTING:

1. THE WESTERLY 800 FT. THEREOF
2. THAT PART OF THE EASTERLY 750 FT. LYING SOUTHERLY OF THE NORTHERLY 2300 FT.

9/18 to Lewis and Colley for signatures

In reply refer to:

NORTHROP

inter-office memorandum

to: JMS

from: hq

subject: Riverside Lease

date: 8/16/68

copies:

ref:

I called Mr. Lynch's secy. earlier this week for the necessary memo to renew this lease. ~~Late last night~~ Before my leaving Thursday PM, Mr. Skilling's secy. called and said they wanted this quarry for another year, and felt that their phone approval would suffice. I don't know if you wish to accept that in this case. I'm sure you'd like something in writing; so am leaving the file for your perusal.

Mr. Skilling's ext. at Anaheim is: 773-1201.

Then .. a memo as the one dated 6 Sept. 1967 has to be typed, which I can do when I return.

hq

Hannah — Follow them as above - then prepare letter exercising option

JUSTIFICATION			
There is a outstanding need for the [illegible] (quarry) for the manufacture [illegible] which cannot be accomplished in the [illegible] Activities to be performed at the site [illegible] a) 2.[illegible] equipment storage [illegible] b) Prepping [illegible] for X-75 [illegible] c) 2.75 Product Improvement, Contract [illegible] d) 2.75 WST-6A/A Tactical, Contract [illegible] e) Flashlamp Development, DTA [illegible]			
			1 OF 1
		REQUESTOR R. R. Mealor	ORGN.-EXT. 5741-665
		REQUEST NO. 145001	DATE 8/6/71
		DELIVER TO	TRIM. ORGN.
		BLDG. & AREA	DATE REQ'D.
		SKETCH—LAYOUT NO.	INSTALLATION REQUIRED ☐ YES ☐ NO
		FACILITY ENGR. J. Saline	PHONE 436
		PROJECT/SCHL. NO.	ITEM NO
		CONTRACT NO.	MOD. NO
		PURCH. ACCT. 963	DASH 71
		SALES ORDER 9996	
VENDOR	P.O. NUMBER	☐ FOR RESALE — ☐ NOT FOR RESALE	LABOR ACCT.
	F.O.B.	SHIP TO / SHIP VIA	MATL. ACCT.
	TERMS	VOL. DISC. / SALES	BUYER
			TYPIST G. Garcia
			PROD. CONTROL

ITEM	QTY	DESCRIPTION	PRICE
		This RFA authorizes the Electromechanical Division to exercise the option to renew the lease for the Edwards Test Site for a period of one (1) year from 1 November 1971 through 31 October 1972 at the current rental rate of $400 per month and under the same terms and conditions as specified in the original lease dated 1 September 1965 and as amended on 11 March 1966. Action Required: Assistant General Counsel to exercise option by notifying Landlord by 30 September 1971. Total cost: $4,800/year	
		TOTAL	4,800.00

M. E. Skilling	DATE	F. W. Lynch	DATE 8/25/71
Indirect Budgets	DATE 8/19/71	R. M. Shoor	DATE 8/25/71
W. B. Simecka	DATE 8/19	R. E. Higgins	DATE 8/25/71
R. S. Taylor	DATE 8/19/71		DATE

MAY 26 1971

[illegible]

[illegible]-71-[illegible]-47

[illegible] 1971

[illegible]

[illegible]

[illegible] for explosives storage [illegible] Welsh Co. [illegible] California. Although [illegible] May 1971, [illegible] of the site will not [illegible] Department [illegible] modify the [illegible] (approx. 4 June 1971).

[illegible] Jr.

[illegible]

NORTHROP

Exhibit B

Teledyne McCormick Selph Documents

McCORMICK SELPH
EXPLOSIVE ORDNANCE
A DIVISION OF TELEDYNE, INC.

P. O. BOX 3098/RUBIDOUX*CALIFORNIA 685-7493

1 October 1965

Stringfellow Quarry Company
Post Office Box 6
Riverside, California

Attention: Mr. Nutt

Reference: Our telephone conversation of 30 September 1965

Gentlemen:

Pursuant to our referenced telephone conversation the following confirmation is submitted.

McCormick Selph is agreeable to the cutting of a firebreak approximately 800 feet long X 100 feet wide along the top ridge of our Easterly property line. However, at present our plant set-up budget does not indicate an allowance for this sort of expense. It is suggested that the cost for the firebreak be provided by the requesting party.

If any additional information is required, please contact the undersigned.

Very truly yours,

McCORMICK SELPH
A Division of Teledyne, Inc.

D. A. SILVAS
Administration Manager

DAS:sk

TELEDYNE
McCORMICK SELPH

P.O. BOX 6

HOLLISTER, CALIFORNIA 95023

(408) 637-3731 TWX (910) 590-0455

18 May 1971

Mr. J. P. Saline, Supervisor
Plant Engineering Department
Northrop Corporation
500 East Orangethorpe Avenue
Anaheim, CA 92801

Dear Mr. Saline:

Enclosed is the original copy of the Agreement for using our Riverside facilities for Dravo storage. Please note that we have corrected the Agreement to conform to our current name; namely, TELEDYNE McCORMICK SELPH.

If you have any questions, please advise.

Yours very truly,

TELEDYNE McCORMICK SELPH

W. W. Winans
Controller

WWW/ddm
Enc. 1 Agreement

Facility Engineering

This agreement, made this ~~2~~ 24 day of ~~April~~ MAY, 1971, between ~~Y rmick Selph Industries, Inc.~~ Teledyne McCormick Selph, Hollister, California hereinafter called ~~McCormick Selph,~~ Teledyne McCormick Selph (TMc/S) and Northrop Corporation, Electro-Mechanical Division, 500 E. Orangethorpe Avenue, Anaheim, California, hereinafter called Northrop, Witnesseth:

1. That for and in consideration of the promises made and monies paid, TMc/S ~~McCormick Selph~~ agrees to let and Northrop agrees to rent five sites shown upon Exhibit "A" attached to and made a part of this agreement, each site to consist of an area approximately square and containing approximately 500 square feet.

2. The above described sites are rented to Northrop for the purpose of Northrop's storing portable magazines containing all classes of explosive materials. TMc/S ~~McCormick Selph~~ will provide seven (7) days per week, 24 hour per day surveillance and reasonable protection of the magazine storage containers and contents therein to be placed on the sites by Northrop during the term of this agreement, and agrees that Northrop personnel will be granted reasonable ingress and egress to their storage magazines at reasonable times during the term of this agreement.

3. This agreement shall be considered a month to month tenancy with cancellation rights on the part of either party upon 30 days advance notification in writing to the other party.

4. TMc/S ~~McCormick Selph~~ will be responsible for compliance with all applicable laws, ordinances, procedures and regulations pertaining to the storage of explosives at the site. Northrop will be responsible for compliance with all applicable laws, ordinances, procedures and regulations relative to the storage containers as placed at the site and the contents therein.

5. For and in consideration of the foregoing obligations on the part of TMc/S ~~McCormick Selph,~~ Northrop agrees to pay to TMc/S ~~McCormick Selph~~ the sum of $250 per month, each month's rental payable on or before the 15th day of the next ensuing month during the term of this lease.

6. As part of the mutual considerations for entering into this agreement, each party agrees to hold the other party harmless from any loss, cost, damage, expense or liability by reason of property damage or personal injury of whatsoever nature or kind arising out of, as a result of, or in relation to activities associated with the storage of explosive materials here under whether caused by negligence or otherwise; provided that nothing in this paragraph shall be construed as relieving either party of its obligations imposed by the preceeding paragraphs.

IN WITNESS WHEREOF, TMc/S ~~McCormick Selph~~ and Northrop have executed this agreement on the day and year first above written.

By: ~~McCormick Selph Industries, Inc.~~ (signature) Teledyne McCormick Selph

Title: President

By: Northrop Corporation (signature)
R. L. Gibney, Vice President
Administration and Finance

Title:

MAR 27 1972

Reply to: Y6120-72-PE-033

23 March 1972

Mr. Web Winans
McCormick Selph Industries, Inc.
P.O. Box 6
Hollister Airport
Hollister, California 95023

Dear Mr. Winans:

Reference our lease agreement, dated 24 May 1971, for rental of storage space at the McCormick Selph Riverside plant and our telecon this date.

Northrop Corporation's requirement for the storage areas has ended. This letter will serve as Northrop's 30 day advance notification to terminate our lease agreement. As agreed upon in the telecon, Northrop will abandon in place five (5) explosive storage buildings at no cost to either party.

Thank you for the service extended to us during the past year and we hope we may be in a position to conduct mutually beneficial business arrangements in the near future.

Very truly yours,

NORTHROP CORPORATION
Electro-Mechanical Division

J. P. Saline, Jr., Supervisor
Plant Engineering

JPS:dd

bcc: E. U. Clark, R. L. Gibney, C. E. Howard, D. A. McInnis, R. J. Norton, H. E. Riggins, W. B. Simecka, J. M. Simon, M. E. Skilling, C. A. Smith, A. VanDerMost, File

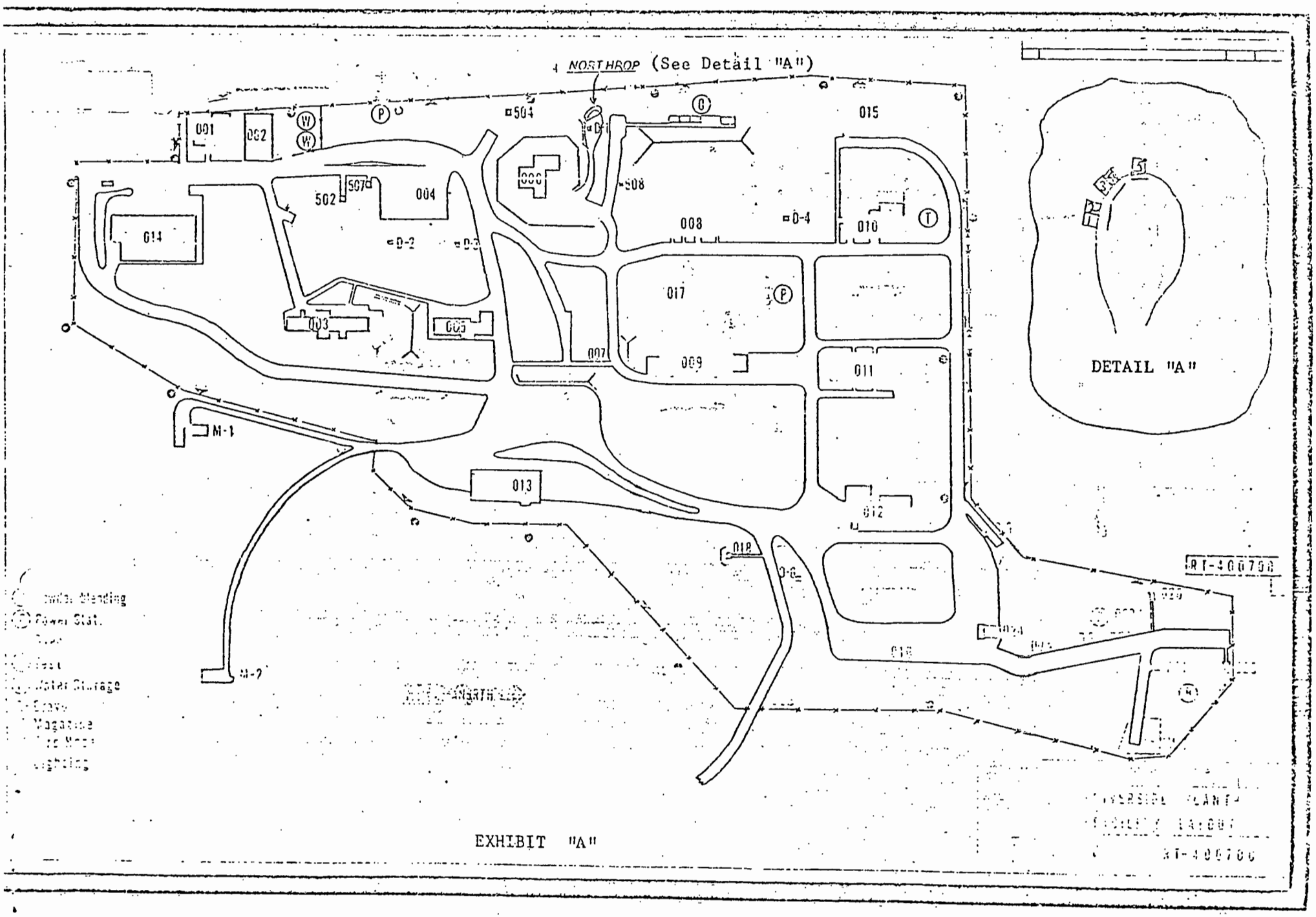

NORTHROP (See Detail "A")
DETAIL "A"
001
002
003
004
005
006
007
008
009
010
011
012
013
014
015
017
018
502
504
507
508
D-2
D-3
D-4
D-6
M-1
M-2
RT-400700
Power Stat.
Water Storage
Magazine
Lighting

EXHIBIT "A"

Exhibit C

Nortronics Conditional Use Permit (CUP)
and Associated Correspondence
and Newspaper Articles

EDMUND G. BROWN
GOVERNOR
STATE OF CALIFORNIA

WILLIAM E. WARNE
ADMINISTRATOR
THE RESOURCES AGENCY

DeWITT NELSON
DIRECTOR
DEPT. OF CONSERVATION

F. H. RAYMON
STATE FORESTE

THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION

DIVISION OF FORESTRY
PO Box 248
Perris, California 92370

Refer to Number

March 24, 1965

RECEIVED
MAR 25 1965
RIVERSIDE COUNTY
PLANNING COMMISSION

Mr. Tyler Suess, Planning Director
Riverside County Planning Commission
Court House
Riverside, California

Attention: Mr. Richard J. Stokes
Planning Associate

Variance Case #701, Nortronics

Gentlemen:

On Tuesday, March 23, an on the site inspection was made with Messrs M. E. Skilling, E. I. Hofmayer, and Chambers of Nortronics and Ranger Truman Holland and Associate Ranger Flake of the California Division of Forestry.

The following are our comments with reference to this variance case and the proposed use:

1. ~~It was recommended that~~ ~~A~~ 300' firebreak shall be put in around the exterior boundary of the area leased by the Nortronics Corporation. The break should follow, as much as possible, the main ridges and, ~~of course~~, may deviate from the property line according to the topography to take advantage of the most suitable area for firebreaks.

2. ~~That~~ Firebreaks shall be constructed from the launch site to the impact area to form an alley. These firebreaks ~~should~~ shall be constructed at least 15% to 20% wider than the expected maximum deviation of the rocket's flight. The area within this alley ~~should~~ shall be then broken into grids, and inflammable vegetation removed by either mechanical means or heavy grazing.

3. From the main exterior break, laterals ~~should~~ shall be run down each negotiable ridge or other satisfactory location to tie into this alley on both sides.

EXHIBIT NO. B
VAR CASE NO 701
(1)

CONSERVATION IS WISE USE—KEEP CALIFORNIA GREEN AND GOLDEN

d. Secondary firebreaks should be installed around each permanent installation, ie: explosive magazines, explosive mixing sites, etc.

5. That there should be at least a minimum storage of 50,000 gallons of water that would be accessible and equipped for quick filling of fire equipment.

6. That in the impact area and the test arena area, these areas be cleared at least 15% to 20% greater than the expected maximum that any weapon or rocket could explode and the maximum distance to which fragments could be expected to fly, in the event of an accident.

7. In the event the variance is granted, that a Fire Plan be developed in cooperation with the Division of Forestry similar to the ones we have developed with other organizations of this type in Riverside County.

Inasmuch as this is a national defense effort, we do not wish to cause complications. However, this particular site is extremely vulnerable to fire, and the possibility of a fire originating in this area and becoming a major fire is highly probable.

We are enclosing a photocopy of a map for your convenience.

We will be glad to cooperate with Nortronics personnel, in every way possible, in working out a satisfactory Fire Plan and fire safety procedures.

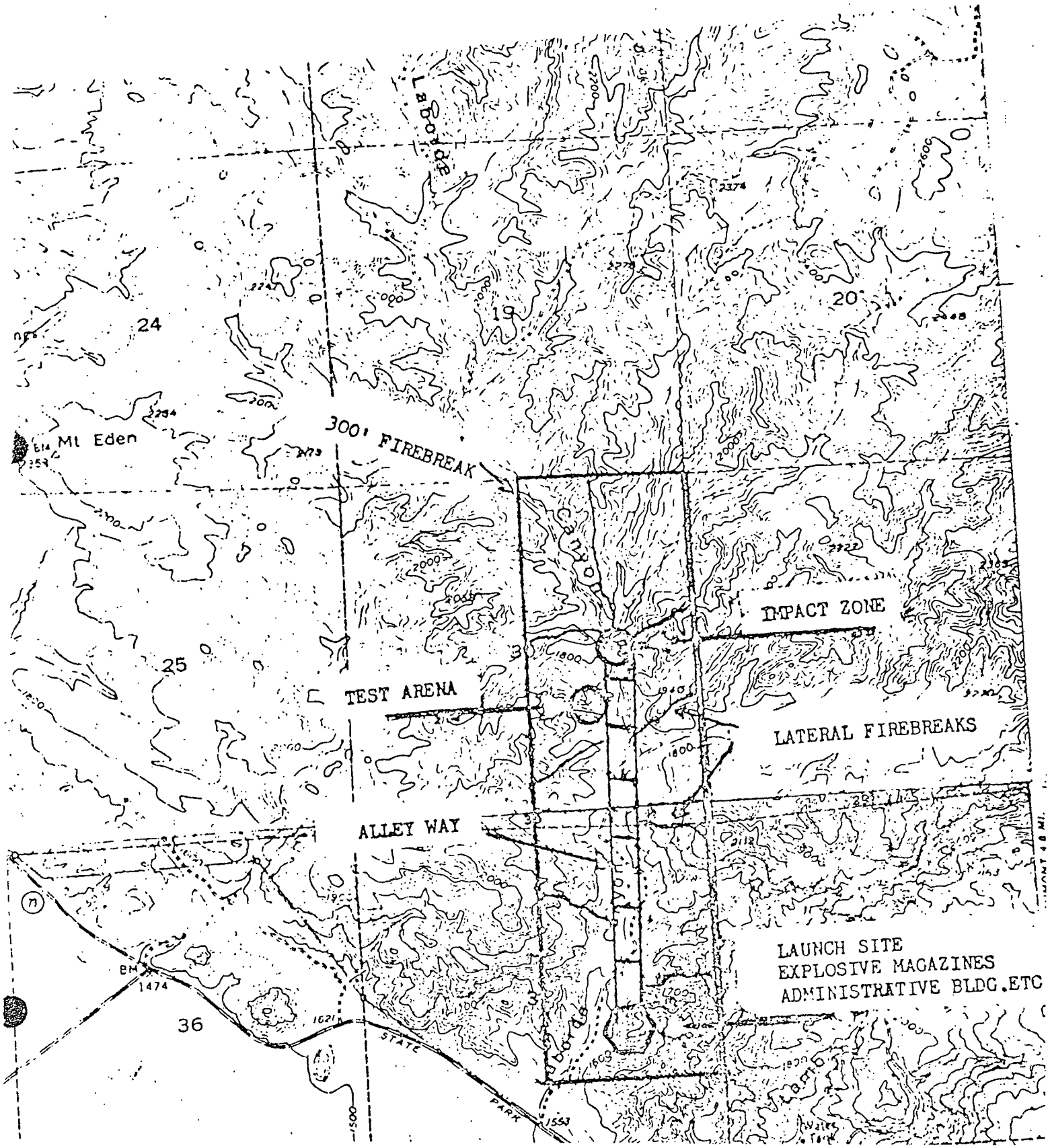
Very truly yours,

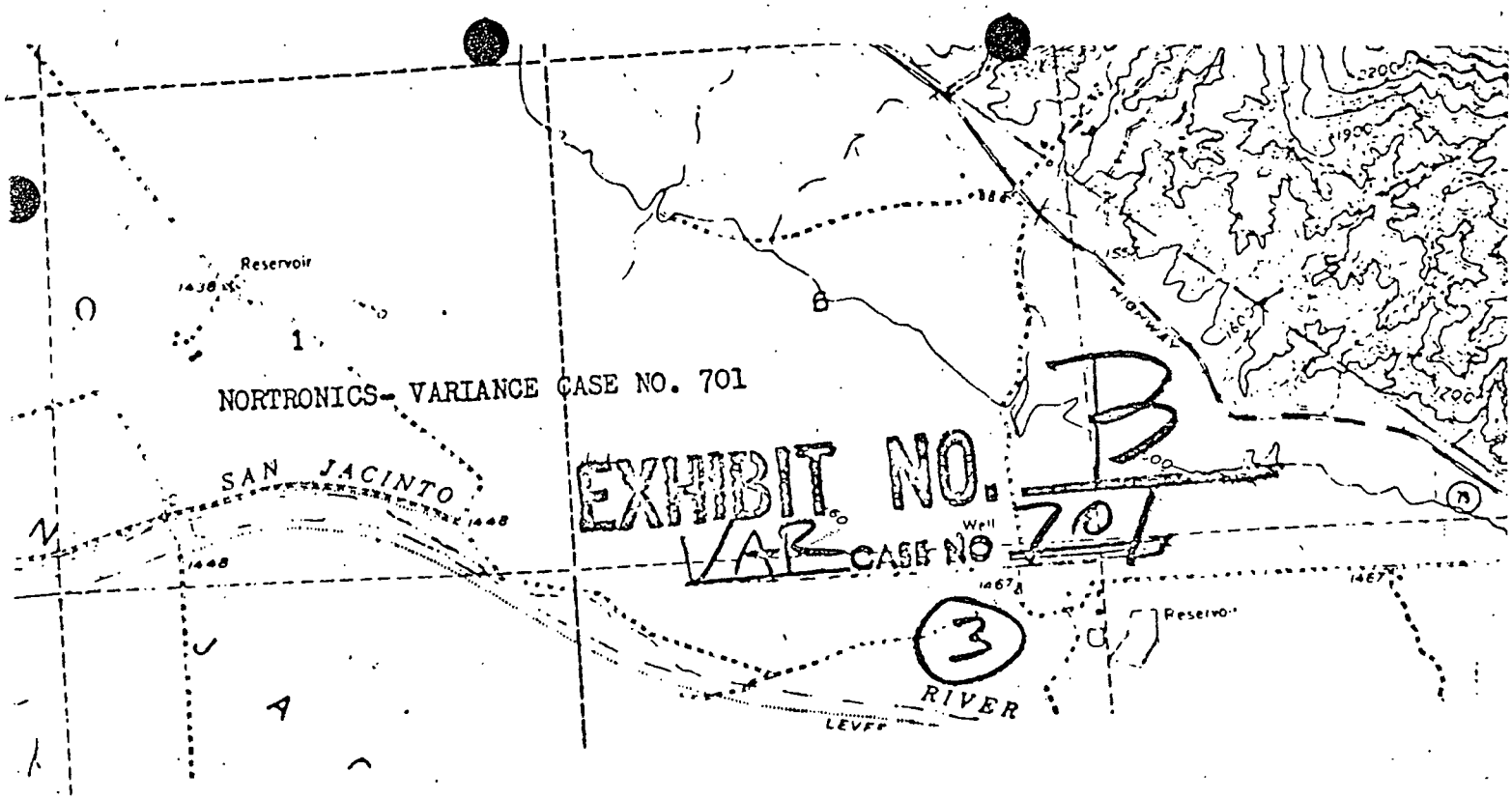
TRUMAN HOLLAND
State Forest Ranger

EXHIBIT NO. B
VAR CASE NO 701
(2)

cc: ASFR Richmond
ASFR Bolster
DLF:TH:fp

Attchmnt


La Bolsa
24
19
20
Mt Eden
300' FIREBREAK
IMPACT ZONE
25
TEST ARENA
LATERAL FIREBREAKS
ALLEY WAY
LAUNCH SITE
EXPLOSIVE MAGAZINES
ADMINISTRATIVE BLDG.ETC
36
STATE
PARK


Reservoir
NORTRONICS- VARIANCE CASE NO. 701
SAN JACINTO
EXHIBIT NO. B
VAR CASE NO 701
Well
3
RIVER
LEVEE
HIGHWAY
Reservoir

FILE

March 26, 1965

Mr. Tyler Suess, Planning Director
Riverside County Planning Commission
Court House
Riverside, California

Dear Mr. Suess: SUBJECT: Variance Case No. 701

We respectfully wish to withdraw our application to establish a testing site for the development of explosives under Variance Case No. 701.

Very truly yours,

Merrill E. Skilling
Chief Plant Engineer

1-1

NORTRONICS. 500 EAST ORANGETHORPE AVENUE, ANAHEIM, CALIFORNIA

A DIVISION OF NORTHROP CORPORATION

In reply refer to:
Y6110-5-IE-183

24 August 1965

Riverside Planning Commission
Court House
Riverside, California

Dear Sirs:

Attached are two (2) copies of a request for a Conditional Use Permit on approximately 122 acres of land located north of the intersection of Pyrite Street and Mission Boulevard (U.S. Route 60). Attached also are seven (7) copies of a plot plan showing the area for which this application applies.

The proposed usage of the property is for the development, testing, and loading in pilot quantities for military programs in explosive ordnance, delivery systems, and tactical weapons systems. The attached plot plan shows the proposed development of the site with the maximum quantity of explosives for each location. The dynamic gun firing will be limited to 155 mm. weapons firing at a range of 250 yards into an earth embankment. There will be no rocket firing at the site. Static testing will be limited to 100 pounds of explosives within an existing quarry in which much larger charges are presently being fired. A maximum of 12,000 pounds of explosives will be stored at the site in 6 separate magazines constructed and spaced per requirements of the U.S. Department of Defense and State of California Industrial Safety Regulations.

It is anticipated that temporary trailers will be used initially to activate the site, but that these will be replaced by permanent buildings as indicated on the plot plan. Buildings will be constructed and spaced per requirements of the U.S. Department of Defense and State of California Industrial Safety Regulations, as well as the Riverside County Building Code.

It is anticipated that twelve (12) full-time employees will initially occupy the site, with a build-up to 50 to 60 employees as the work load develops.

A $50.00 check for the filing fee for this application is attached. We will greatly appreciate your expeditious handling of this application, as Northrop work in connection with the National Defense effort is involved.

Very truly yours,

M. E. Skilling

M. E. Skilling,
Chief Plant Engineer

CHANGED FROM 50 TO 250 PER TELEPHONE CONVERSATION ED NEWMAYER & RICHARD STOKES, 9-27-65. E.S.

CONCURRENCE:
D. C. Sillyphant, 8-24-65

MES/pm
Attachments

COUNTY OF RIVERSIDE, CALIFORNIA

TO THE RIVERSIDE COUNTY PLANNING COMMISSION:

Name of Applicant Northrop Corporation

Use Applied for Property is to be used for the development, testing, and loading in
(State fully proposed use of property)
pilot quantities for military programs in explosive ordnance, delivery systems, and tactical weapons systems.

Legal Description of Property
(Give exact legal description as recorded in the office of the County Recorder)

The Northeast Quarter of Section 1, Range 6 West, Township 2 South, San Bernardino Base and Meridian.

Excepting: 1. The westerly 800 feet thereof and

2. That part of the easterly 750 feet lying southerly of the northerly 2,300 feet.

The northerly 1,000 feet of the westerly 800 feet of the southeast quarter of Section 1, Range 6 West, Township 2 South, San Bernardino Base and Meridian.

Situated Three-quarter miles north of the intersection of Pyrite Street and Mission
(Give general location by street address, street boundaries, district, etc.)
Boulevard (U.S. Route 60) approximately 6 miles west of Riverside.

STATE OF CALIFORNIA,)
COUNTY OF RIVERSIDE,) ss.

I, M. E. Skilling, being first duly sworn, depose and say that the foregoing statement and answers therein contained are in all respects true and correct to the best of my knowledge and belief.

CONCURRENCE: D.C. Fullington 8-24-65

Signed Northrop Corporation by M. E. Skilling

Phone No. (714) 871-5000, ext. 701

500 E. Orangethorpe Ave., Anaheim, Cal.
(Address)

Subscribed and sworn to before me this 24th day of August, 1965

Rosella H. Jordan
(Notary Public)

ROSELLA H. JORDAN
My Commission Expires July 18, 1967

STATE OF CALIFORNIA,)
COUNTY OF RIVERSIDE,) ss.

I, L. E. Nutt, being first duly sworn, depose and say that I am the owner of the property involved in this application and that such application is being made with my full knowledge and permission.

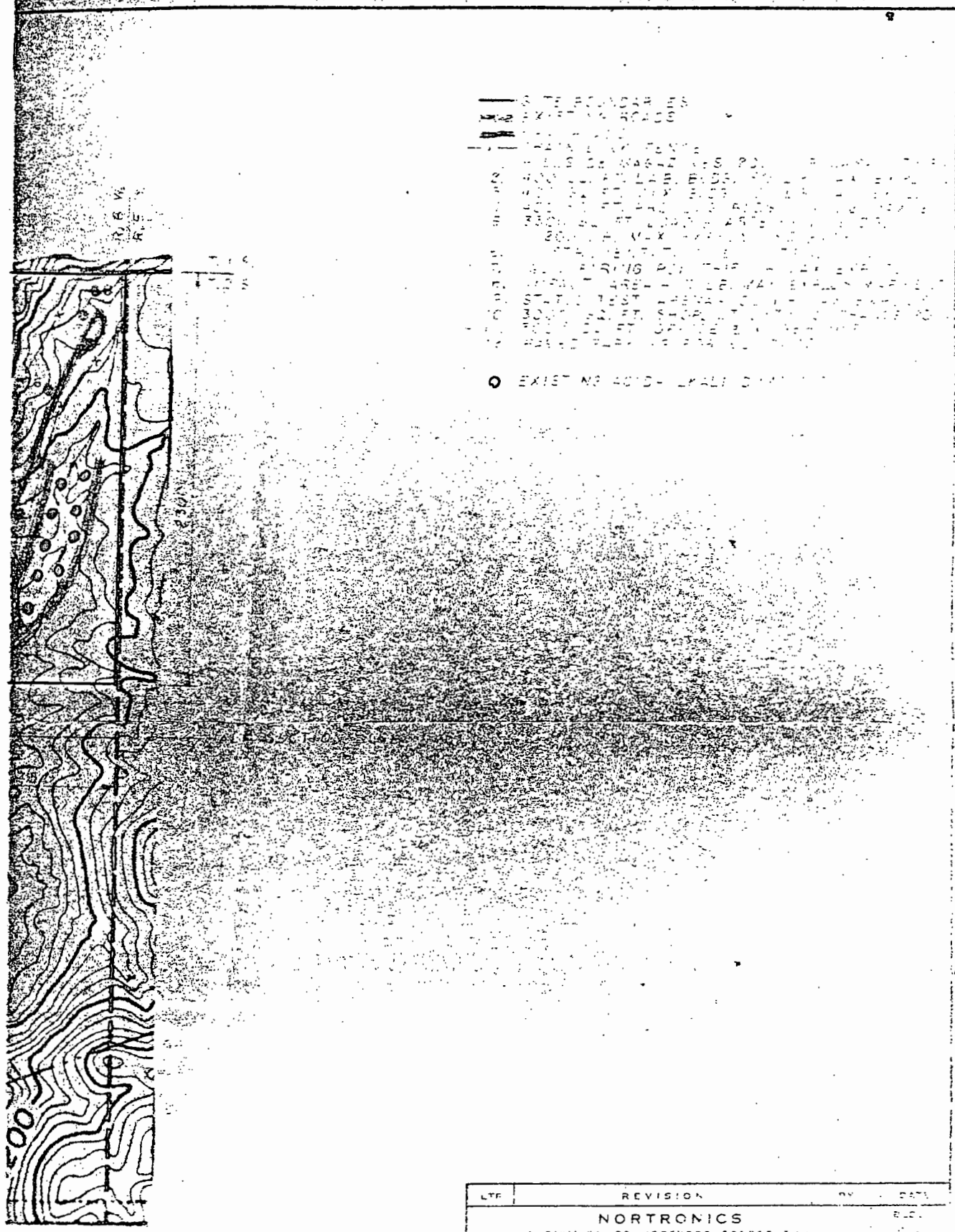
Signed Stringfellow Quarry Company by L. E. Nutt

Phone No. OVerland 5-5231

P.O. Box 6, Riverside, California
(Address)

Subscribed and sworn to before me this 25th day of August, 1965

LEGAL DESCRIPTION



LTR	REVISION	BY	DATE

NORTRONICS

A DIVISION OF NORTHROP CORPORATION

INDUSTRIAL ENGINEERING DWG.

DRAWN BY | SCALE | DATE

CHECKED BY | DRAWING NUMBER | DWG

APPROVED

APPROVED

JOHN M. ROSE, Chairman, Corona
ELMER M. KATZENSTEIN, Vice-Chairman, Rubidoux
KAY H. OLESEN, Palm Desert
MAURICE A. PERRY, Hemet
LEONARD M. KIRKPATRICK, SR., Perris
HAROLD L. MOYER, Beaumont
HORACE MILLER, Blythe

Ex-Officio
A. C. KEITH, County Surveyor and Road Commissioner
ERIC L. WAITE, County Assessor
RAY T. SULLIVAN, JR., County Counsel

HAZEL I. EVENSEN, Secretary

COUNTY OF RIVERSIDE

COPIES OF LETTER & CONDITIONS TO
✓ WOTTS
LYNCH
RICKETTS
JOERGER

PLANNING COMMISSION

TYLER SUESS, PLANNING DIRECTOR
COURT HOUSE, RIVERSIDE, CALIFORNIA 92501
TELEPHONE 683-4000

AF:29978

October 7, 1965

Northrop Corporation
c/o M. E. Skilling
500 East Orangethorpe Avenue
Anaheim, California

Gentlemen:

SUBJECT: Conditional Use Case No. 803

Enclosed please find copy of our letter to the Board of Supervisors reporting approval of your application for conditional use permit to establish a facility for the purposes of development, testing and loading in pilot quantities for military programs in explosive ordnance, delivery systems and tactical weapons systems in Zone M-3 (Regulated Industrial) in the Glen Avon District.

Attached also is extra set of conditions attached to your conditional use permit and agreement thereon to be signed as indicated and returned in quadruplicate.

Very truly yours,

RIVERSIDE COUNTY PLANNING COMMISSION

Tyler Suess, Planning Director

TS:af
Encls.

RECEIVED
11 OCT 1965
Facility Engineering

RFB:29960
Reel 110-Side 1-627-775

October 6, 1965

The Honorable Board of Supervisors
Court House
Riverside, California

SUBJECT: Conditional Use Case No. 803
Northrop Corporation
Facility for Purpose of Development
Testing and Loading for Military
Program in Explosive Ordnance etc.
Zone M-3
Glen Avon District

Gentlemen:

Second Supervisorial District

The Planning Commission respectfully reports approval of a Conditional Use Permit for Northrop Corporation, c/o M. E. Shilling, 500 East Orangethorpe Avenue, Anaheim, California, to establish, operate and maintain a facility for purpose of development testing and loading for military program in explosive ordnance, etc. in Zone M-3 (Regulated Industrial) on property located northerly of the extension of Pyrite Street, extending northerly to the Riverside-San Bernardino County Line in the Glen Avon District, subject to the attached conditions.

Pursuant to Ordinance No. 348, a public hearing was held on this matter before the Planning Commission on September 28, 1965. A summary of testimony presented is attached.

After full and complete consideration of all the facts and circumstances involved, together with the report of the staff, the Commission found that the proposed use would not be detrimental to the public health, safety and welfare to the community in which it is located.

It was regularly moved and unanimously carried at the regular meeting of the Commission held on September 28, 1965 that the report of the Commission's action be transmitted to your Honorable Board.

No further action is required by your Board unless an appeal is filed by the applicant or some property owner within 300 feet of the exterior boundaries of this property under consideration within 7 days of the receipt of this report by your Board, or the Board on its own motion by majority vote orders the application transferred to it for final action.

Respectfully submitted,

RIVERSIDE COUNTY PLANNING COMMISSION

Tyler Thompson, Planning Director

TS:af
Encls.
Application
Legal
Labels
Property Owners List
Map
Summary
Conditions

cc: Supervisor Anderson
Land Use (3)
Earthrop Corporation ✓
U. S. Department of Defense
State of California Industrial Safety
Department of Public Health
State Division of Forestry
Clerk of the Board

SUMMARY OF HEARING

RIVERSIDE COUNTY PLANNING COMMISSION
September 28, 1965 1:45 P. M.

Reel 110 - Side 1 - 627 - 775
CONDITIONAL USE CASE NO. 803
Northrop Corporation
Facility for Purpose of Development
Testing and Loading for Military Program
in Explosive Ordnance etc.
Zone M-3
Glen Avon District
Second Supervisorial District

PROPONENTS:

Merrill Skilling, representing Northrop, 500 East Orangethorpe, Anaheim: (648) Firing will not be a constant thing - possibly 2 to 3 times per week or per day - which is a composite average. There may be no firing for weeks or months. Would normally fire between 8:00 A. M. and 4:45 P. M. Propose 10 to 12 buildings on the site. Will start off with a few trailers and gradually construct buildings as the business picture warrants. Will commence with 10 to 12 employees and this could grow to as many as 50 to 60 persons. The area is such that trespassing is not considered a problem - because of acid pits in the area, etc. Barbed wire fence proposed around the area - but chain link fence around actual installations. The magazines will be under security. The 155mm is the only known test at this time - and will not be firing rockets in this area. Firing is controlled by fixed firing. Lease negotiated at this location is on 15 year basis with 15 year option. Plan to spend a considerable amount of money in the area and question the time limit placed in the conditions. Some loading operations will be involved in connection with testing of pilot quantities - not production type. Buildings will be concrete block types with normal safeguards required for ordnance work - in compliance with requirements of State Board of Industrial Safety and within requirements of government agencies. Pyrite Street will be used for access - dirt road to acid dumps. Operation similar to this carried on within the city of Anaheim.

Earl Chambers, representing Northrop, 500 East Orange-thorpe, Anaheim (670) Regarding safeguard of 12,000 lb. magazine area - and a cyclone fence with 3 or 4 strands of barbed wire at the top will be provided; armored platedoors that normal gunfire will not penetrate. The magazines will be sunk in hillsides - igloo type.

OPPONENTS: None

There being no further testimony, the Chairman declared the hearing closed at 2:30 P. M. See Reel 110 (Side 1 - (627 - 775)

CASE NO. 803 — PLANNING COMMISSION CONDITIONS
[illegible] 28, 1965

Facility for Purpose of Development,
Testing and Loading in Pilot Quantities
for Military Programs in Explosive
Ordnance, Delivery Systems and
Tactical Weapons Systems
Zone M-3
Glen Avon District
Second Supervisorial District

1. The development of the premises shall conform substantially with that as shown on plot plan marked Exhibit "A" on file with Conditional Use Case No. 803 in the office of the Riverside County Planning Commission unless otherwise amended by the following conditions.

2. The use permitted hereunder is limited to the development, testing, and loading in pilot quantities for military purposes in explosive ordnance, delivery systems and tactical weapons systems but shall not permit rocket firing at any time.

3. Dynamic gun firing shall be limited to 155 mm weapons firing at a range of 250 yards into an earth embankment.

4. Static testing shall be limited to 100 pounds of explosives within quarries.

5. A maximum limit of 12,000 pounds of explosives may be stored on the property and in accordance with construction and space requirements as established by the U. S. Department of Defense and State of California Industrial Safety regulations.

6. Trailers may be used on a 12 month basis, within which time permanent buildings are constructed. Said trailers shall be used for operation purposes only and shall not be used as housing units.

7. Perimeter fencing as shown on Exhibit "A" shall be constructed of chain link fence, 5 feet in height with metal warning signs posted on said fence at 500 foot intervals.

8. Prior to the issuance of a building permit for construction or use contemplated by this approval, the applicant shall first obtain permits and/or clearance from the following public agencies:

Department of Public Health — State Division of Forestry

Evidence of said permit or clearance from above agencies shall be presented to the Land Use Division of the Department of Building and Safety at the time of the issuance of a building permit for the use contemplated herewith.

10 November 1965

Mr. John H. Bennett
3963 - 10th Street
Riverside, California

Dear Mr. Bennett:

In response to your letter of November 4 addressed to Mr. Skilling, Northrop Corporation will attend the public hearing concerning the test site which has been scheduled for Monday, November 15, at 1:30 p.m.

At that time the Company will be prepared to answer all questions with respect to this matter as may be asked by the Riverside County Board of Supervisors.

Very truly yours,

Robert B. Watts, Jr.
Assistant General Counsel
Northrop Corporation

bcc: E. Parker
J. Ricketts
M. Skilling

John H. Bennett
3963 10th Street
Riverside, Calif.

November 4, 1965

Merrill Skilling
Nortronics
500 East Orangethorpe
Anaheim, California

Dear Mr. Skilling:

As you probably are aware by now, concern has been expressed here in Riverside about the weapons test-site that your company is proposing to build in Glen Avon. In response to an appeal, the Riverside County Board of Supervisors has scheduled a public hearing on the test-site for Monday, November 15, at 1:30 p.m. I hope that you can be present at that time to represent your company's viewpoint.

One thing that I am still in the dark about is the purpose of the test-site: namely, the kind of weapons that would be developed there and how they might eventually be used. As I am planning to attend the hearing, I wonder if you could clarify this matter for me.

Sincerely,

John H. Bennett

John H. Bennett

APPEAL FOR PUBLIC HEARING

To the Riverside County Board of Supervisors:

We, the undersigned, hereby appeal for a public hearing to reconsider the recommendation of the Riverside County Planning Commission for approval of a conditional use permit to Northrup Corporation for a testing range in Glen Avon District, Case # 803.

We have reason to believe that the use to which such permit would be put could be detrimental to the public safety, a public nuisance, and adverse to the general welfare. (Ordinance 348, Article III, Sections 3.1, 3.4)

We feel that the original Planning Commission hearing of September 28, 1965, was inadequate, since no one was present to oppose the granting of the permit.

Leona Bernstein

October 10, 1965

Jim Warner

3432 FLORIDA
686-9875

Gadd D. Seekins

Mrs. Sarah F. Seekins

Gordon Hall

Bobbie Wood

Ellsley Seckler

Marian Letz

Margaret A. Clark

Submitted to the Clerk of the Board of Supervisors, October 11, 1965

Naomi Treisman

Andrew Katona

John H. Bennett

Edna Infante

1785 LOMA VISTA
682-1864

1791 D. Loma Vista St (off Chicago)

Riverside County Conditional Use Permit for Ordnance Testing at Stringfellow Quarry

1. Presentation by Facilities to the Riverside Planning Commission resulted in the granting of a use permit. However, 18 people have objected to this action with the result that the Riverside Board of Supervisors must now hold a public hearing with respect to this matter.

   Hearing is scheduled for Monday, November 15 at 1:30 p.m.

Data Necessary for Preparation of Presentation Before the County Board of Supervisors

1. Copy or detailed summary of the statements made to the Planning Commission with respect to this conditional use permit.

   Precisely what was said?

2. Copies of all press releases which appeared in the newspapers as a result of the above presentation.

3. Legal basis for the pending hearing before the Riverside County Board of Supervisors.

   a. Copies of Riverside County Ordnances and Regulations relating to the granting of conditional use permits.

   b. Rules relating to the operation of the Riverside Planning Commission.

4. All available data and information relative to the 18 people who appealed the Planning Commission's granting of the use permit.

   a. Ages.

   b. Do they reside in the county?

   c. Do they own property anywhere in the area of the Stringfellow Quarry?

   d. What objections, if any, have been raised by surrounding land owners?

   e. Have we received approvals of our proposed activity from the State Forestry people? Any other Government agencies?

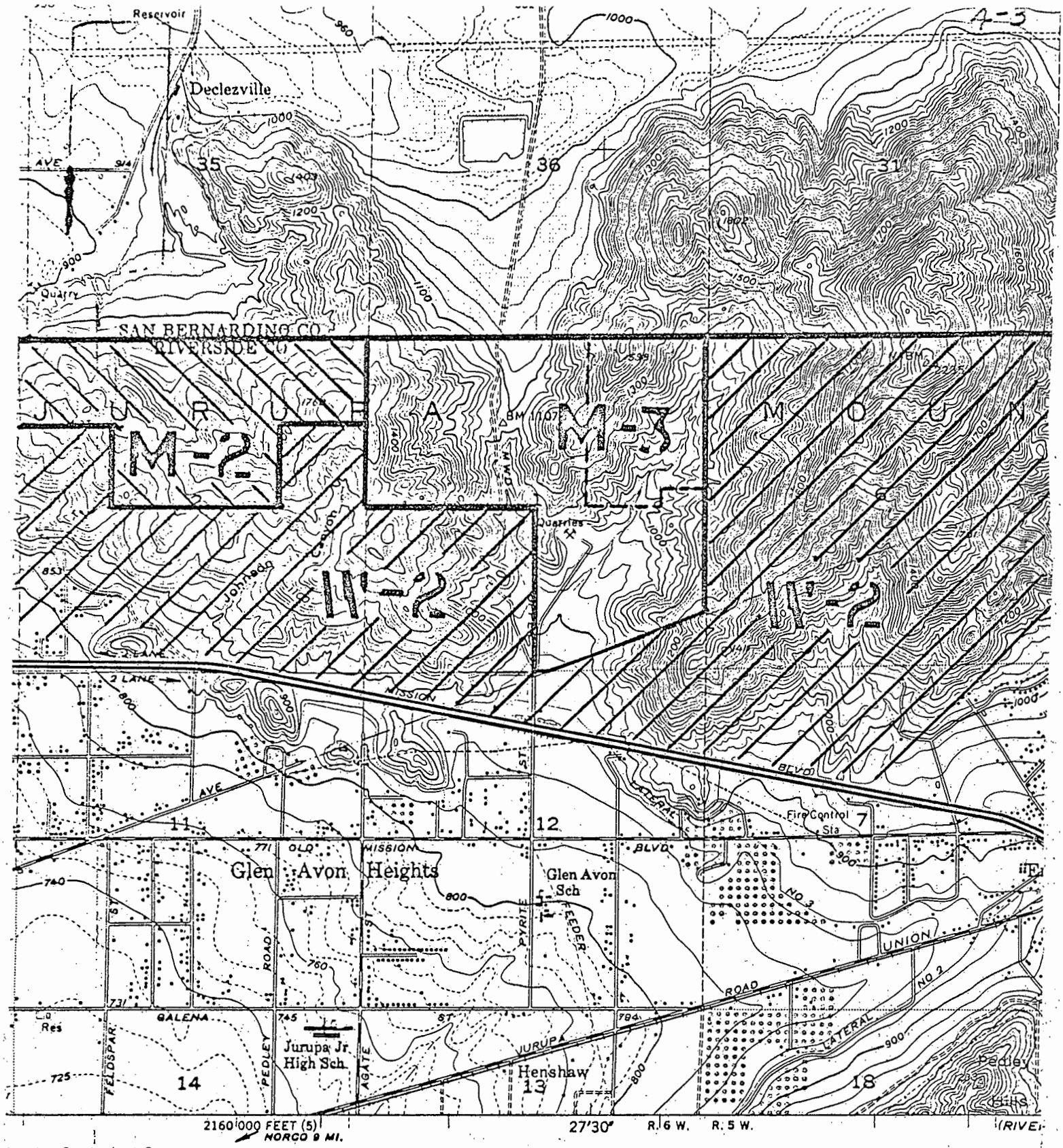
f. Analysis of the current uses of land surrounding the Stringfellow Quarry to demonstrate conclusively the compatibility of our proposed ordnance testing.

5. Detailed analysis of our proposed ordnance testing program.

   a. What can be publicly discussed and what cannot be publicly discussed?

   b. What portion of our proposed program is Company sponsored research? What portion is covered by Government contract?

6. To what extent is our activity directly related to the conflict in Vietnam?



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Data Necessary for Preparation of Presentation
Before the County Board of Supervisors

1. At the Planning Commission Hearing on 28 September 1965, the Staff of the Planning Commission presented to the Commission the data shown on the attached exhibits.

   1-1. Letter, Skilling to Planning Commission.
   1-2. Application for Conditional Use Permit.
   1-3. Drawing "Remote Ordnance Site".
   1-4. Proposed Planning Commission Conditions.

   Mr. Skilling was called on by the Planning Commission to answer certain questions by the members of the Commission. A summary of Mr. Skilling's statements, as well as those of Mr. Earl Chambers (who was called by Mr. Skilling to answer certain technical questions), is attached.

   1-5. Summary of Hearing.

   In addition, Mr. Skilling stated that Northrop Ordnance activity had been stepped up due to the war in Viet Nam.

   1-6. Planning Commission Conditions approved at Hearing is attached.

2. Press release as a result of Planning Commission Hearing.

   2-1. Riverside Calif. Enterprise, 30 September 1965, is attached.

3. The legal basis for the pending hearing before the Riverside County Board of Supervisors is contained in the Zoning Ordinance of the County of Riverside, Ordinance No. 348, Section 18.26, which also sets forth the rules and regulations governing the Planning Commission and the granting of Conditional Use Permits.

   3-1. Section 18.26 (4 pages) is attached.

4. Signers of the Petition appealing the Planning Commission's approval of the Conditional Use Permit.

   4-1. Copy of "Appeal for Public Hearing" is attached.

   a. It appears that John H. Bennett is the only registered voter in Riverside County of those who signed.

   4-2. Press release of 7 November 1965, from Riverside Press Enterprise, containing information on John Bennett, is attached.

4. (Continued)

b. Ladd G. Seekins and Edna Infante are the only names in the Riverside telephone directory that are the same as the signatures on the Petition. Two other names in the telephone directory could be those of signers.

c. None of the signers appear to own property in the area of the Stringfellow Quarry.

d. No objections have been received from surrounding land owners.

e. We have met with the State Forestry Division and have tentative approval of our fire plan. We have not submitted the final documents required for their formal approval. We have contacted the Department of Public Health and have determined that their interest is in (1) safe drinking water, and (2) properly disposed of sewage. Their approval cannot be obtained prior to actual submission of building plans to the Building Department. These are the only two Government agencies whose approval is required by the Planning Commission Conditions.

f. All of the Stringfellow Quarry property is zoned M-3.

4-3. Map showing zoning of Riverside County property adjacent to Stringfellow property is attached.

4-4. M-3 Zone (3 pages) showing a proposed amendment in pencil on Paragraph 3.1(C)17(15). is attached.

4-5. W-2 Zone (3 pages) is attached.

4-6. M-2 Zone (3 pages) showing a proposed amendment in pencil on Paragraph 12.1(b)(2) is attached.

5. A detailed analysis of the usage of the site is contained in the letter accompanying the Application for Conditional Use Permit.

a. Public discussion should be limited to general statements.

b. Portion of proposed remote site activity.

1) Company funded 30 to 40 percent.
2) Government contract 60 to 70 percent.

6. Nortronics' ordnance work is all related to military explosives. To the extent that U.S. Government ordnance activity is stepped up due to Viet Nam, Nortronics' ordnance work is similarly affected.

SECTION 18.24. WATER WORKS FACILITIES. Water works facilities, both public and private, intended primarily for the production and distribution of water for irrigation purposes, shall not be subject to any of the provisions of this ordinance.

SECTION 18.25. SWIMMING POOLS. Swimming pools may be constructed as follows:

(a) Private swimming pools for the use of the occupants of the premises and their nonpaying guests shall be located not nearer than five (5) feet to any property line or dwelling;

(b) All other swimming pools shall be located not nearer than ten (10) feet from any property line or building;

(c) A swimming pool may be constructed contrary to subdivision (a) above when it lies partially within and partially without a dwelling which conforms with all other provisions of this ordinance.

SECTION 18.26. NOTICE OF HEARING PROCEDURE. (a) Wherever this Section is referred to elsewhere in this Ordinance, the procedure for notice, hearing, and appeal shall be as follows:

(1) FILING AND CHECKING APPLICATION. Where an application or petition is filed pursuant to this Ordinance, which can be granted only after a public hearing, a period of not more than fourteen days shall be allowed for checking to determine the application's completeness and accuracy.

(2) SETTING HEARING. After having been found to be complete and accurate by the Planning Commission Staff, said application or petition shall be submitted by the Staff to the Planning Commission at its next regular meeting held five days or more after such determination, at which meeting a public hearing thereon shall be set.

(3) NOTICE OF HEARING. Notice of the public hearing shall be given in accordance with the provisions of Government Code Section 65951. Such notice may be given either by mailing notices to all property owners within a 300-foot radius of the exterior boundaries of the area actually occupied or to be occupied by the use which is the subject of the application, or by publication of the notice once in a newspaper of general circulation published in the County at least ten days before the

hearing, and posting said notice in conspicuous places close to the property for a ten-day period prior to the hearing. When such notice is given by mailing, it shall be through the United States mail, postage prepaid and the property owners and their addresses shall be ascertained from the last adopted tax roll of the County.

(4) ADMINISTRATION OF OATHS AND ATTENDANCE OF WITNESSES. The chairman or the acting chairman of the Commission may administer oaths and compel attendance of witnesses.

(5) NOTICE OF DECISION. The Commission shall reach its decision within a reasonable time after the closing of the public hearing, or any rehearing thereof. Notice of its decision shall be filed with the Clerk of the Board of Supervisors, together with its report of the proceedings, not more than 15 days after the making of such decision. A copy of the notice and the report shall be mailed to the applicant and proof of such mailing shall be indicated on the original notice filed with the Clerk of the Board of Supervisors. If the Commission does not reach a decision due to a tie vote, such fact shall be reported to the Board of Supervisors in the same manner and within the same time limits as set in this subsection for reporting decisions and such failure to reach a decision shall constitute a denial of the application.

(6) PLACEMENT OF MATTER ON BOARD'S AGENDA. The Clerk of the Board of Supervisors shall place the Notice of Decision on said Board's agenda for the next regular meeting which is held five or more days after such Notice has been filed.

(7) <u>TRANSFER TO BOARD OF SUPERVISORS OR APPEAL</u>. The granting, either with or without conditions, or the denial of any application by the Commission shall be final unless, within 7 days after the meeting at which the Notice of Decision is placed on the Board of Supervisors agenda, either of the following two actions is taken:

(a) An appeal to the Board of Supervisors is made by the applicant or any owner of property within 300 feet of the exterior boundaries of the area actually occupied or to be occupied by the use which is the subject of the application. Such appeal shall be filed in writing with the Clerk of the Board of Supervisors; or

(b) The Board of Supervisors orders the application transferred to it for further proceedings.

(8) FURTHER PROCEEDINGS BEFORE THE BOARD OF SUPERVISORS. If either of the actions mentioned in paragraphs (a) and (b) of Subsection 7 above are taken, the Board of Supervisors may:

(a) Affirm the action of the Commission; or

(b) Require a transcript or recording of the testimony and all other evidence upon which the Commission made its decision. Upon receiving such evidence, the Board of Supervisors shall take such action as, in its opinion, is indicated by such evidence; or

(c) Refer the matter back with or without instructions to the Commission for further proceedings which shall be noticed in accordance with the procedure set forth in this Section (18.26) for an original hearing in those cases where the direction is given to take additional evidence or permit argument; or

(d) Set the matter for hearing before itself. At such hearing the Board of Supervisors shall hear and decide the matter de novo as if no other hearing had been held.

(9) TRANSMISSION OF EVIDENCE BY COMMISSION. If requested by the Board of Supervisors so to do, the Commission shall transmit to the Board of Supervisors a complete transcript or complete recording of all of the testimony and all papers, exhibits, maps, and other evidence introduced either before the Hearing Board or before the Commission or both, in any case which the Commission has decided.

(10) LIMITATION ON RECEIPT OF EVIDENCE. In deciding an appeal, the Board of Supervisors shall not hear or consider any evidence of any kind other than the evidence received from the Commission, or any argument on the merits of the case than that contained in the Notice of Appeal, unless it sets the matter for hearing before itself, as provided in this Section and gives the same notice of hearing as required for hearing set forth in paragraph (3) of Subsection a. of this Section.

(11) COST OF TRANSCRIPT. In those cases where an appeal is made to the Board of Supervisors by either the applicant or any owner of property within 300 feet of the exterior boundaries of the area actually occupied or to be occupied by the use which is the subject of the application, in which appeal the Board of Supervisors orders a transcript prepared of the testimony taken before the Commission or the Hearing Board, the cost thereof

shall be paid by the appellant, in the amount estimated by the Board of Supervisors, prior to the preparation of such transcript. Notice of the necessity for the payment of such fees, which shall be accomplished by deposit with the Clerk of the Board of Supervisors, shall be given by said Clerk by mailing in the United States Mail written notice to the address given said Clerk by the appellant at the time of filing his appeal. If the funds necessary for the cost of such transcript are not deposited with said Clerk within ten days after the giving of written notice, the appeal shall be deemed withdrawn by the applicant.

(12) HEARING ON APPEAL OR TRANSFER TO THE BOARD OF SUPERVISORS. Upon ordering the application transferred to it, or, in the case of an appeal being filed, at its next regular meeting following such filing, the Board of Supervisors shall determine in which manner the appeal or transfer will be handled under the several methods set forth in Paragraph 8 above. If a public hearing is required, it shall be set for a date not less than 14 nor more than 45 days thereafter unless the cost of a transcript is required to be furnished by the appellant, in which event the hearing shall be set for a date not less than 14 nor more than 45 days after the receipt of such fees. The Board of Supervisors shall give notice of the public hearing in the manner provided for notice of such hearing as set forth in Paragraph 3 above. The Board of Supervisors, at such public hearing, shall proceed to hear relevant testimony from any person or persons interested. Within 15 days after the close of such hearing, the Board of Supervisors shall render its decision sustaining, reversing, or modifying the action of the Commission.

(13) NOTICE OF HEARING TO PUBLIC OFFICIALS. Notice of the hearing, where one is called, shall be given to such public officials as in the opinion of the Planning Director may be affected by the proposed use, and to such other officials as the Commission may direct.

~~SECTION 18.27. TRANSCRIPT OF HEARING. Any person desiring a transcript of a hearing may obtain a copy or copies by requesting such from the Clerk of the Board of Supervisors and depositing a sum as determined by the Clerk of the Board of Supervisors to be sufficient to cover the cost thereof.~~

~~SECTION 18.28. TRAILER AS RESIDENTIAL STRUCTURE. For the purposes of this ordinance, a trailer, mobilehome, or camp car, defined in Chapter 1, Part 2, of Division 13, of the Health and Safety Code,~~

ARTICLE III

M-3 ZONE (REGULATED INDUSTRIAL)

All the unincorporated territory of the County which is not included under the terms of this ordinance in any other zone is hereby designated and classified as M-3 Zone.

Where a structure is erected or a use is made which is expressly and specifically permitted in one or more other zones under this ordinance, such structure or use shall be subject to the most restrictive requirements and regulations of any zone in which such structure or use is expressly and specifically permitted.

SECTION 3.1. USES PERMITTED.

(a) Any use permitted in Zones M-4, A-2, and W-2, except outdoor advertising signs or structures not appurtenant to a permitted use.

(b) A trailer, not part of a trailer park, used as a single family residence.

(c) Commercial poultry operations, subject to the same conditions as required in the A-1 Zone.

The Commission shall not recommend that a permit be granted under this Article unless the applicant demonstrates that the proposed use will not endanger the public health or safety or conflict with or be adverse to the general welfare. A person shall not, without first having obtained a permit therefor, use any premises or erect any building in Zone M-3 which is designed, occupied or used or intended to be occupied or used for any of the following businesses, occupations or purposes:

1. Abattoir (slaughterhouse).
2. Airport or landing field.
3. Auto wrecking yard.
4. Blast furnace.
5. Borrow pit, commercial.
6. Boiler shop or works.
7. Commercial cattle feeding yard or sales or auction yard. This does not include cattle feeding in conjunction with farming operations nor community auction and sales yards.
8. Cemetery, pet or human.
9. Coke ovens.
10. Drive-in theater.
11. Fat rendering.
12. Fish cannery.
13. Gas, storage of, in excess of one thousand (1,000) cubic feet.
14. Incineration, reduction or dumping of offal, garbage or refuse on a commercial scale.

15. Junk yard.
16. Lumber mill.
17. Manufacture of:
    (1) Acetylene gas.
    (2) Acid
    (3) Ammonia
    (4) Asphalt or products
    (5) Asbestos
    (6) Brick tile or terra cotta
    (7) Babbit metal
    (8) Bleaching powder
    (9) Carbon, lampblack or graphite
    (10) Cement
    (11) Celluloid
    (12) Chlorine gas
    (13) Coal tar or products
    (14) Creosote or products
    (15) Explosives, or the testing of or the commercial use thereof
    (16) Fireworks
    (17) Fertilizer, including open storage on a commercial scale.
    (18) Gas, illuminating
    (19) Gelatine
    (20) Glucose
    (21) Glue or size
    (22) Guncotton or products
    (23) Gypsum
    (24) Insulating material (such as "Rock Wool" and similar products)
    (25) Lime or products
    (26) Matches
    (27) Phenol
    (28) Pickles
    (29) Plaster of Paris
    (30) Poison
    (31) Potash
    (32) Pulp, paper and strawboard
    (33) Rubber
    (34) Sauerkraut
    (35) Soap, except by cold process
    (36) Tar or asphalt roofing
    (37) Turpentine
    (38) Vinegar
18. Meat packing plant.
19. Oil reclaiming plant.
20. Ore reduction plant.
21. Petroleum refinery.
23. Race track, except for contests between human beings only.

24. Rifle range, including pistol range.
25. Rock or slag crusher or quarry.
26. Rock, sand or gravel pit.
27. Rolling mill.
28. Rubber reclaiming plant.
29. Salt works.
30. Sand blasting plant.
31. Sewer farm or sewage disposal.
32. Smelting.
33. Stockyards, commercial, except in conjunction with farming.
34. Storage of petroleum products above ground in excess of one thousand (1,000) barrels.
35. Storage or baling of rags or paper, except wholly within a building or behind a compact wall not less than six (6) feet in height.
36. Tannery.
37. Trailer park.
38. Wool pulling or scouring plant.
39. Wood or bone distillation.
40. Dog kennels.
41. Hog ranches which are not required to obtain a permit under the provision of Ordinance No. 431 and in which more than three hundred (300) hogs are kept, fed, or maintained.
42. Trap and skeet shooting facilities.
43. Camp grounds.
44. Oil well drilling or oil processing.
45. Area for the storage, alteration, or repair of a relocated building or structures.
46. Cotton Gins.
47. Manageries.
48. Areas or facilities, on a commercial basis, for amusement or entertainment where the motive power for all or any portion of the activity is not electricity.
49. Migrant Agricultural Worker Mobilehome Parks, subject to minimum standards and conditions adopted by resolution of the Board of Supervisors.

That this section shall not be interpreted or construed to require a permit in the carrying on of any of the aforementioned businesses, occupations or purposes where such businesses, occupations or purposes are merely incidental or accessory to a farming or domestic operation.

~~SECTION 3.2. PERMIT PROCEDURE.~~

~~(a) Any person desiring a permit to establish any use referred to in this Article shall make written application therefor to the Commission on forms which shall be provided by the County for this purpose. Such application shall state the name and address of the applicant therefore; evidence~~

ARTICLE XV

W-1 ZONE - WATERCOURSE, WATERSHED, AND CONSERVATION AREAS

W-2 ZONE - CONTROLLED DEVELOPMENT AREAS

SECTION 15.1. W-1 ZONE (WATERCOURSE AREA) STATEMENT OF POLICY. There are some areas of the County which under present conditions are not suited for permanent occupancy or residence by persons for the reason that they are subject to periodical flooding and other hazards. Therefore, for the public safety and interest, health, comfort, convenience, preservation of the public peace, morals, order and the public welfare, the Board of Supervisors does hereby create a zone classification within which it shall be unlawful to erect or maintain places for permanent human occupancy.

The provisions of this Article XV concerning W-1 Zones (Watercourse Areas) are temporary in nature, awaiting detailed plans of development for the lands and areas so classified. Therefore, the regulations of this article shall apply to lands so classified, only until either (1) a drainage and storm water control plan approved by the County Planning Commission and the Board of Supervisors shall have been carried out and put unto effect, or (2) the lands have been subdivided and a final subdivision map placed on record in accordance with the applicable state and county regulations, including approval by the County Planning Commission and Board of Supervisors. In either of such instances, namely the approval and carrying out of a drainage and storm water control plan, or the filing of a final subdivision map, the properties included therein shall automatically be classified in Zone W-2 and thereafter may be reclassified in any other proper zone through the usual procedures before the County Planning Commission and the Board of Supervisors.

SECTION 15.3. USES PERMITTED IN W-1 ZONE. Farming, agriculture and horticulture, flower and vegetable gardening on a commercial scale, nurseries and greenhouses; public and private utilities such as railroads, electrical power and transmission lines, water wells and water and gas pipes or lines and golf courses and other outdoor recreational facilities not involving the construction of buildings.

The following uses may be permitted provided a permit has been obtained under the procedure and conditions provided in Article III:

(a) Airplane landing strips.
(b) Extractive industries affecting the earth's surface.

SECTION 15.50. W-2 ZONE. (CONTROLLED DEVELOPMENT AREA) STATEMENT OF POLICY. There are certain areas in the County which by

virtue of their peculiar character with respect to location, climatic conditions, topography, and natural resources are unique. The Board of Supervisors finds that such areas should be developed only after approval of the type and method of use in the manner hereinafter set forth.

SECTION 15.51. USES PERMITTED IN W-2 ZONE.

(a) Residential and Light Agricultural Uses.

(1) Any use permitted in the R-1 and A-1 Zones, subject to the conditions set forth therein.

(b) Public, Semi-public and Commercial Uses. The following uses may be permitted provided plans for the location and development thereof have been first approved by the Planning Commission as evidenced by resolution of record:

(3) Hotels, bungalow courts and auto courts.

(4) Guest ranches.

(5) Educational institutions, including governmental and civic uses.

(6) Golf, civic, tennis, polo or country clubs.

(7) Commercial stables or riding academies.

(8) Commercial uses for the convenience of and incidental to any of the above permitted public and semi-public uses when located upon the same lot or parcel of land.

(c) Public Utility Uses.

(1) Structures and installations necessary to the conservation and development of water such as dams, pipe lines, water conduits, tanks, reservoirs, wells and the necessary pumping and water production facilities.

(2) Structures and the pertinent facilities necessary and incidental to the development and transmission of electrical power and gas such as hydro-electric power plants, booster or conversion plants, transmission lines, pipe lines and the like.

(3) Radio broadcasting stations.

(4) Telephone transmission lines, telephone exchanges and offices.

(5) Railroads, including the necessary facilities in connection therewith.

(6) Television broadcasting stations, antennas, and cable installations.

(d) The following industrial and other uses provided a permit shall have first been obtained from the Board of Supervisors as provided in Article III.

(1) Airport or landing field.

(2) Borrow pit, commercial.

(3) Cemetery - pet or human.

(4) Lumber mill.

(5) Lumber production of a commercial nature, including commercial logging or commercial development of timber.

(6) The manufacture of:
  (a) Brick, tile or terra-cotta.
  (b) Cement.
  (c) Gypsum.
  (d) Lime or lime products.
(7) Trailer parks.
(8) Public and private camp grounds.
(9) Migrant Agricultural Worker Mobilehome Parks.

(e) Heavy Agricultural Uses. The following heavy agricultural and other uses, provided a permit shall have first been obtained from the Board of Supervisors in the manner provided in Article III.
  (1) All general agricultural pursuits on a commercial scale, including:
    (a) Grazing, feed yards, salesyards, commercial stables and riding academies.
    (b) Hog ranches subject to the provisions of Ordinance No. 431, as amended.
    (c) Menageries; alligator, ostrich or fox farms; sheep and goat raising; animal hospitals; commercial dog kennels and dog breeding establishments; mushroom farms and dairies.
    (d) Fruit and vegetable packing plants and similar uses.
    (e) Fairgrounds of a public nature including commercial uses accessory or appurtenant thereto.

SECTION 15.52. BUILDING HEIGHT LIMIT. For residential, agricultural and commercial uses, the same as in the zone in which such use is first ordinarily or primarily permitted. For public utility uses, none. For industrial uses, none, except that the Board of Supervisors may in the granting of a permit, attach such conditions as to height of structures as may be necessary to assure that the intent and purpose of this ordinance are observed and the public health, safety and general welfare is secured.

SECTION 15.53. REQUIRED LOT AREA. Five acres, including the area to the center of the adjacent streets, shall be the minimum lot used for any purposes except as follows:
(a) Public utility uses as set forth in Section 15.51.
(b) Where a subdivision map has been recorded pursuant to all provisions of Riverside County Ordinance No. 460, including a report regarding flood hazard from the public agency having jurisdiction.
(c) Where a development plan has been approved by the Planning Commission pursuant to the following standards:
  (1) The development plans shall be drawn to scale and show the complete boundaries of the subject property, adjacent streets and easements, drainage structures,

ARTICLE XII

M-2 ZONE (HEAVY INDUSTRIAL)

The following regulations shall apply in all M-2 Zones:

SECTION 12.1. USES PERMITTED.

(a) Any use permitted in M-1 and M-3 Zones, including those uses for which a permit is required under Article III, except as provided in paragraph (b) of this section, and except places of public assembly, churches, schools, hospitals, sanitariums, trailer parks and cemeteries.

(b) The following uses shall be allowed only if a permit is first obtained from the Board of Supervisors in the manner provided in Sections 3.2 to 3.6 inclusive:

(1) Commercial cattle feeding yards. This does not include cattle feeding in conjunction with farming operations. (2) the testing of or the commercial use of explosives

(c) Auditoriums which are an accessory use to a use permitted in M-2 Zones.

(d) The operation of junk yards or automobile wrecking yards, including storage, shall be conducted in an area entirely and completely enclosed by a solid fence or wall, not less than eight (8) feet in height, and all materials shall be so placed within said fence or wall that such material does not extend in height above the enclosing fence or wall and two (2) gates not to exceed twelve (12) feet in width may be installed at convenient places in such fence or wall, the same to be kept closed when not in use for access purposes.

(e) No building shall be permitted for residential purposes except dwelling units on the same lot as a factory or industry, used exclusively by the Superintendent of such factory or a caretaker, or both.

(f) Outdoor advertising, 500-foot interval.

SECTION 12.3. FRONT YARD REQUIRED. None, except that no building shall be erected or altered so as to encroach upon any existing or proposed future street line as shown on any official plans of the County.

SECTION 12.4. LIMITATION ON PERMITTED USES. Uses maintained in an M-2 Zone shall be conducted and operated in such a manner as to comply with the following standards.

(a) Definitions. Words used in these standards shall have the meanings hereinafter ascribed:

(1) Particular Matter. "Particular Matter" is material which is suspended in or discharged into the atmosphere in finely divided form as a liquid or solid at atmospheric temperature and pressure.

(2) Dusts. "Dusts" are minute solid particles released into the air by natural forces or by mechanical processes such as crushing, grinding, milling, drilling, demolishing, shoveling, conveying, covering, bagging, sweeping, blasting, etc.

(3) Combustion Contaminants are particulate matter discharged into the atmosphere from the burning of any kind of material containing carbon in a free or combined state.

(4) Atmosphere. "Atmosphere" means the air that envelopes or surrounds the earth. Where air pollutants are emitted into a building not designed specifically as a piece of air pollution control equipment, such emission into the building shall be considered an emission into the atmosphere.

(5) Standard Conditions. "Standard Conditions" are a gas temperature of 60 degrees Fahrenheit and a gas pressure of 14.7 lbs., per square inch absolute. Results of all analyses and tests made to determine the question of compliance with the standards of the M-2 Zone shall be calculated or reported at this gas temperature and pressure.

(b) Ringlemann Chart. A person shall not discharge into the atmosphere from any single source of emission whatsoever any air contaminant for a period or periods aggregating more than three minutes in any one hour, which is as dark or darker in shade, as that designated as No. 2 on the Ringlemann Chart, as published by the United States Bureau of Mines.

(c) Nuisance. A person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such person or the public or which cause or have a natural tendency to cause injury or damage to business or property.

(d) Particulate Matter. Except as otherwise provided in paragraph (e) hereof, a person shall not discharge into the atmosphere from any single source, particulate matter in excess of 0.4 grains per cubic foot.

(e) Specific Contaminants. A person shall not discharge into the atmosphere from any single source of emission whatsoever any one or more of the following contaminants, in any state or combination thereof, exceeding in concentration at the point of discharge:

(1) Sulphur Compounds, calculated as sulphur dioxide (SO_2): 0.2 per cent by volume.

(2) Combustion Contaminants: 0.4 grain per cubic foot of gas calculated to 12 per cent of carbon dioxide (CO_2) at standard conditions.

(f) Regulations. All uses in M-2 Zones shall comply with and conform to the rules and regulations of the Riverside County Air Pollution Control District as the same may hereafter be adopted or amended.

AMENDED EFFECTIVE: February 19, 1962
AMENDED EFFECTIVE: November 10, 1965 (Ord. 348.401)

RIVERSIDE, CALIF.
ENTERPRISE
D. 24,307 — S. 54,925

SEP 30 1965

2-1

$250,000 investment

Planners approve weapons test site

By DIANE SOREM
Daily Enterprise Staff Writer

Weapons for use in Southeast Asia may be developed at a testing site in the area known as the Stringfellow Quarry in the Jurupa District.

The Riverside County Planning Commission Tuesday approved a conditional use permit for Northrup Corp. to test military weapons in a regulated industrial zone in Glen Avon.

The commission's decision will be reported to the Board of Supervisors, where no further action is required unless it is appealed.

A REPRESENTATIVE of Northrup, which has ordnance headquarters in Anaheim, said the corporation's program has been accelerated because of the Viet Nam conflict.

The firm has had a similar operation in the City of Anaheim for the past five years, but its business has expanded so it can no longer be accommodated at that site, the spokesman said. Firing in Anaheim is done in an eight-foot diameter conduit, while testing here would be in the quarries.

Company representative Merrill Skilling said afterward the firm hopes to begin working on the site in about 60 days. He said it is negotiating a 15-year lease on the property with another 15-year option.

IF THE PLAN materializes, Skilling said, Northrup would spend in excess of $250,000 on the project in the first five years.

It would be located north of the extension of Pyrite Street extending to the Riverside-San Bernardino County line. Pyrite would be used for access.

Skilling described one phase of de[illegible] as involving a [illegible] shotgun- [illegible] example, be from an airplane which would explode into fragments given velocity by the plane's speed.

THE EQUIPMENT would be tested on the ground, and Skilling said the nature of the tests would keep fragments in the area. He also said safeguards would make it impossible to elevate the guns to shoot above or out of the impact area.

The spokesman said there would be about three test periods a week with tests two or three times a day.

He said 10 to 12 small buildings are planned. They would begin with a few trailers and gradually construct facilities as the business picture warrants, he said.

Ten to 12 employes at the start could be increased to 50 or 60 according to Skilling.

WIRE FENCES topped by barbed wire will be built around the storage ma[illegible] construction [illegible] with armor plate [illegible] cording to the firm. The commission also required chain link fencing around the [illegible] range.

Gun firing will be [illegible] by the conditions of approval to 155mm weapons firing at a range of 250 yards into an earth embankment. No rocket firing will be permitted.

Skilling also said no noise problem was expected. Commission restrictions added at Tuesday's meeting included firing hours of 7 a.m. to sunset.

THE COMMISSION considered putting a five-year review clause in the conditions, but decided the county's power to revoke a permit on grounds that a project is detrimental to the public health or safety or a public nuisance would be adequate.

The operation would be adjacent to acid dump pits and near another weapons testing facility, according to the planning department. Northrup had attempted earlier to establish a site in the Hemet-San Jacinto area [illegible] up [illegible]

V-C-R-2

A look at the few UCR st

By JOEL BLAIN
Press-Enterprise Staff Writer

Student protest at the University of California, Riverside, always has been small in proportion to the total campus population. This year, while protest has not increased in volume it has changed its character by attacking new problems.

"Most students are interested in their social life first and academic standing second," said Mike Devirian, president of the UCR Associated Students and a senior physics major from Pasadena.

"ONLY A VERY FEW," he said, "have either the energy or the inclination to participate in politics on or off campus. We don't especially like it this way, but the facts are obvious."

Student apathy is not an exclusive UCR idiosyncrasy. At UC, Berkeley, acknowledged to be one national campus center of political activity, the majority of students quietly pursue their private lives.

Two Berkeley professors, sociologist Seymour Martin Lipset and political theorist Sheldon Wolin, writing in "The Berkeley Student Revolt," said the "public impression is that most students agree with (the demonstrators' last fall), when in fact this is not the case."

Dick Farrell, a leader of the UCR organization Declare, which describes itself as a "liberal campus forum" and a senior social science student from Compton, said in reference to the Berkeley demonstrations:

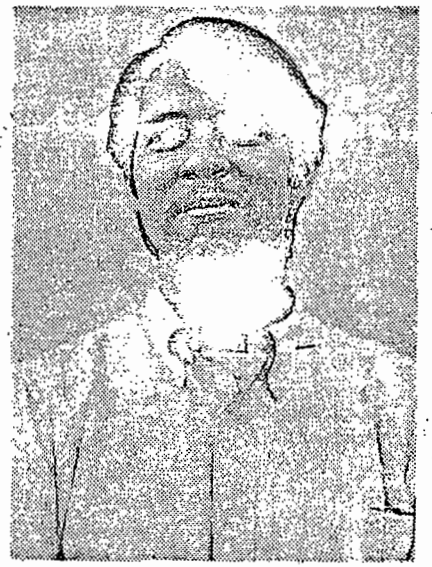
"MANY FORGET THAT less than three per cent of the total number of Berkeley students were sufficiently committed to allow themselves to be arrested during the Sproul Hall sit-in."

In previous years, UCR student protest was generally a response to a particular situation when students believed their standing in the academic community was being challenged.

Academic freedom, the preservation of the UCR liberal arts atmosphere and the right of students to express themselves collectively were fundamental issues. Community, national and international problems (with the possible exception of civil rights) might be objects of discussion but rarely action.

According to Gary North, who was a member of the Student Executive Council from 1960-62:

"A loose coalition was forged when the university committed a particularly senseless blunder. This coalition never solidified to form a stable structure but was the result of informal agreement between such interests as the campus newspap the associated students and vario clubs."



MIKE DEVIRIAN
. . . *Student body president*

North, now a graduate student history and originally from Ma hattan Beach added:

"THE COALITION was not vided along libera and conservati lines, although it certainly was do inated by those espousing views l of center — mainly because the were more of them. The situatio which required students to prot were those for which ideological po tions had little meaning."

There are few campus contro sies today which are of interest those students oriented toward p test, a circumstance which has forc them to turn to problems outside t university, such as Viet Nam, t draft, and racial integration in R erside.

The paucity of campus issu has been attributed, in part, to t political adroitness of Chancellor Iv Hinderaker, now in his second ye at UCR.

David McLellan, associate prof sor of political science and facul sponsor of several politically-orient student groups in the past, said:

"THE ADMINISTRATION mak itself aware of potential areas of u rest and acts promptly to meet wi students in order to effect compr mise before the situation is allow to reach a crisis."

Declare leader Farrell, wh acknowledging the effectiveness the chancellor's policies, disagre with the principles behind them.

"The administration's method he said, "is to rationally discu every aspect of a problem — go men meeting in fellowship to wo out differences. Yet the universi

Languages would be cut

UCR may increase science r

By TOM PATTERSON
Press-Enterprise Staff Writer

The faculty of the College of Letters and Science at the University of California at Riverside has voted in favor of increasing the required min-

was disclosed by Dr. Thomas Jenkin, vice - chancellor for academic affairs. It approved, on a package basis, proposals made by Dr. Carlo Golino, dean of the college.

Many of the changes related to

ment was offered to r al three quarters, th the present requirem but the obvious com al of two quarters or the old requirement, fore the group.

nts who stir things up

and the students often have conflicting interests, and despite all the good will in the world they cannot be resolved outside of a demonstration of power by one side or the other."

Moreover, the administration often has anticipated, not responded to, those students interested in politics. The chancellor initiated this fall the Political Union, a forum for debate modeled after the Oxford institution.

THE ONLY campus issue of any consequence this semester has been Chancellor Hinderaker's decision to continue the Highlander Awards — grants to athletes and those in the participating arts. Student critics, pointing out that seven out of eight awards went to those engaged in sports, said the program was a guise for athletic scholarships and the beginning of a policy emphasizing sports at UCR.

MARC MILLER
Chairman of Declare

Marc Miller, chairman of Declare and a junior political science major from West Los Angeles, said the "Highlander Awards were an example of the administration using the full resources of its power. But it was done in such a fashion as not to be obnoxious and precipitate great student discontent."

One of the most active student groups today is the newly-formed Students for a Democratic Society chapter, which has been channeling its energies to community and national problems. The first activity of SDC was sponsoring an uneventful march and vigil in downtown Riverside recently opposing U.S. policy in Viet Nam.

THE NEW GROUP, led by John Bennett, a junior psychology major from Arcadia, has adopted a more radical stance than Declare, directing itself toward action rather than discussion.

According to Bennett, who returned to UCR this semester after spending two years directing a nursery school in a depressed area of Fresno as a selective service-sanctioned alternative to military service, SDS is planning an anti-draft campaign at UCR, during which students will be encouraged to register as conscientious objectors.

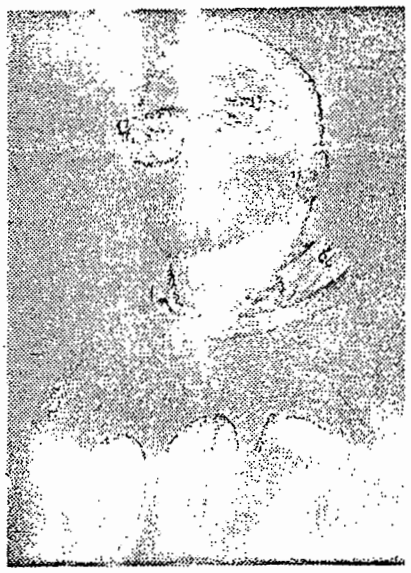
Bennett said that the group will not advise students to resort to ploys to avoid service, which would be "stooping to expedience. Rather, we want to see them take the most noble and respectable course by refusing to participate in the terribleness of war."

UCR students also have been active in Riverside civil rights movements. Many served as teachers i the one-day Freedom School set u last September when some paren boycotted Lowell and Irving eleme tary schools to protest alleged c facto segregation.

ACTION BY conservative UC students always has been limite both in number involved and in the willingness to forcefully expound the views.

This year, however, conservativ have been somewhat more active, a though they still represent a minori voice in comparison with their li eral counterparts.

Conservatives have published newsletter and two of their spoke men are writing columns for t campus newspaper, The UCR Hig lander.



DICK FARRELL
Leader in Declare

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make an even sharper differentiation than in foreign language between the specialist and non - specialist.

Course would be specifically designed for the non - specialist, featuring demonstrations rather than formal laboratory experiments.

District to ask school sites okay

CORONA — The school district will ask the city planning commission to review three areas designed as future school sites at the commission's meeting tomorrow night.

7:30 p.m. in the council chan bers at Civic Center.

While the district does n need formal approval of t commission in order to d velope a site, school officia

RIVERSIDE, CALIF.
PRESS
— D. 31,634 —

OCT 18 1965

Supervisors to air weapons test site

The proposed Northrop Corp. weapons testing site in Glen Avon, which narrowly achieved official approval last week, was set today for a hearing Nov. 15 by the Board of Supervisors.

The conditional use permit for the site was approved by the county Planning Commission and routinely reported to the board last week, but a petition filed within the seven-day deadline forced the hearing.

EIGHTEEN names appeared on the petition which charges that the tests would be "detrimental to the public safety, a public nuisance and adverse to the general welfare."

Supervisor Paul Anderson, who represents the Jurupa District, had little comment after the meeting, saying he had not yet formed an opinion on the issue. He said he did not recognize any of the names on the petition and had not been contacted by opponents of the permit.

The Anaheim corporation has stated in a letter to the board that testing at the site in the Stringfellow Quarry area will be limited to 155 mm. weapons firing at a range of 50 yards into an earth embankment and to 100 pounds of explosives within an existing quarry. There would be no rocket firings according to the firm.

A MAXIMUM of 12,000 pounds would be stored in six separate storage facilities, the letter said.

The location is three-quarters of a mile north of the intersection of Pyrite and Mission Blvd. about six miles west of Riverside.

There was no opposition at a commission hearing on the matter Sept. 28. Northrop representatives said then their program had been stepped up because of the Viet Nam conflict.

They also said the firm planned to spend something over $250,000 on the site which it intends to lease for 15 years with another 15-year option.

There is another weapons testing site presently in the same area.

The Press

RIVERSIDE, CALIFORNIA WEDNESDAY, NOV. 10 1965 SECTION D—PAGE ONE

Munitions test site protest unit forms

A group of Riverside students and others has announced it will oppose a weapons testing site in the Glen Avon area at the Board of Supervisors hearing Monday on moral, economic and safety grounds.

University of California junior John Bennett said this morning he expects about 10 people to speak out against the proposed Northrup Corp. location in the Stringfellow Quarry in the Jurupa District.

A PETITION signed by 18 persons brought the matter to a hearing. The petitioners had charged the tests would be "detrimental to the public safety, a public nuisance and adverse to the general welfare."

The Board of Supervisors had already accepted a Planning Commission action approving Northrup's request for a conditional use permit when the petition for an additional hearing was submitted.

Bennett said a group of students, teachers and ministers will challenge the site grounds that weapons to be developed there "would only intensify the misery already being suffered by the Vietnamese people."

BENNETT IS associated with Students for a Democratic Society on the university campus here but said he is not officially representing the organization. The site opponents are "more of a community-based group," he said.

Another target of the group will be militarization of the county economy, with claims that approximately one-third of Riverside County's industrial manpower is currently involved in defense work.

A third factor concerns a possible safety hazard produced by the site. In this regard, Bennett said, petitions will be circulated tonight in Glen Avon.

BENNETT SAID the group has written 13 different individuals, including professors on seven university and college campuses, for advice and support in the protest.

He said he expects a response from Stanley Sheinbaum, a staff member of the Center for the Study of Democratic Institutions in Santa Barbara, which will be read at the public hearing. Sheinbaum, said Bennett, was an adviser to the South Vietnamese government at one time.

He also expects a supporting letter from economist Kenneth Boulding at the University of Michigan. He described Boulding as an economist who has studied the problem of economic conversion from a war-time to a peace-time economy.

ATTEMPTS made to reach Nobel Prize-winning chemist Dr. Linus Pauling, a disarmament proponent, have not received an answer, Bennett said.

He said another spokesman for the group will be Eubanks Carsner, retired botanist and member of the Riverside Society of Friends (Quakers).

The protesting group plans to meet Thursday to coordinate its effort.

Northrup representatives told county officials the corporation plans to develop weapons which could be used in Southeast Asia at the site north of an extension of Pyrite Street. Within five years it would become a $250,000 project, a spokesman said.

Exhibit D

Documents describing Northrop Activities at the Stringfellow Site

REMOTE ORDNANCE FACILITY

PLAN

CONCURRENCE: _____

Ordnance Systems Section

Dated: 4 August 1965

Prepared by:

Industrial Engineering

28 July 1965

SCOPE:

The purpose of this report is as follows:

1. To establish the concept of a Remote Ordnance Site.
2. To list the site data for the Stringfellow Quarry.
3. To schedule a course of action.
4. To obtain management approval for lease negotiations for the Stringfellow Quarry.

CONCEPT:

A remote ordnance site will be established to supplement the existing facilities available to the Ordnance Section for the development, testing, and loading in pilot quantities of explosive ordnance, delivery systems, and tactical weapons systems. (See Appendix I and II for utilization and facility/equipment requirements related to tasks.)

The on-site development and test center was constructed at Anaheim in 1960. This facility has limited capability for explosive storage, mixing, casting, machining, loading, and test firing with a free-flight limitation of 50 feet.

A license was obtained from the U.S. Government in April, 1965, for the use of 10 square miles at Camp Irwin for a period of one year for the purpose of test firings up to a range of 4,000 yards, including lateral dispersion in flight. It is planned that this license will be renewed as long as the need for this type of firing continues, and that all necessary test firing that cannot be conducted at our own Remote Site will be conducted at Camp Irwin.

The selection and facilitation of a Remote Ordnance Site will be based on providing, at the greatest convenience and least practical expense, an overall capability for development, testing, and loading in pilot quantities for military programs in explosive ordnance, delivery systems, and tactical weapons systems, including the facilities already available for this use.

The present development work load is beyond capacity and capability of the Anaheim facility, so this overload work must be done at a Remote Ordnance Site.

A test firing range for 4,000 yards or one for 2,000 meters would require areas of approximately 13 square miles or 3 square miles respectively. The acquisition of a site of this size would be economically unfeasible, so these long range test firings will continue to be performed at Camp Irwin. However, it would be inconvenient and costly in travel time to perform all test firings and static explosions at Camp Irwin, so limited facilities for these items are included in the Remote Site requirements.

The Remote Site must provide facilities for loading in pilot quantities as none are presently available.

STRINGFELLOW QUARRY SITE:

1. Location

The Stringfellow Quarry site is located on U.S. Route 60, approximately 6 miles west of Riverside as shown on the attached map. It is approximately 40 miles and 50 minutes by motor vehicle from Nortronics Anaheim.

2. Present Usage

The Stringfellow property consists of three-fourths of a section of land with portions of the property presently being utilized for the following purposes.

a. A Stringfellow-operated stone quarry
b. A Stringfellow-operated heavy construction business
c. Two separate ordnance operations on leased ground
d. An automobile wrecking yard on leased ground
e. A heavy equipment rental yard on leased ground
f. Stringfellow-operated acid and alkali dump pits

3. Nortronics Area

The site available for lease by Nortronics is within the red boundaries shown on the attached sketch. The area enclosed in red is approximately 110 acres but Nortronics would have non-exclusive use with respect to the Stringfellow-operated acid and alkali dump pits which are located between the two existing roads shown in blue on the attached sketch. In addition, we would have use of the quarry site (coordinated with the quarry operation) for static tests.

SITE DATA FOR STRINGFELLOW QUARRY:

The following table and drawings indicate the data pertaining to a Remote Ordnance Site located at Stringfellow Quarry.

1. Distance from Nortronics Anaheim . . . . . 40 Miles

2. Firing Test Range (gun firing of projectiles of up to 10 pounds high explosive, TNT, or equivalent, content)

a.	Direction of firing (for photographic purposes) .	Northeast
b.	Firing distance - range (yards)	50 Yards
c.	Range width (yards) 7.5° each side of ℄ . . .	15 Yards
d.	Range slope (%).	2-3 maximum
e.	Impact zone radius (yards)	7.5 yards
f.	Impact zone configuration slope (%)	2-10 maximum
g.	Separation from other activities (feet) . . .	1,000 feet
h.	Separation from other activities - barrier . .	Artificial earthworks backstop and natural barrier

SITE DATA (Continued)

3. Static explosion tests (warhead or other devices of high explosive, TNT or equivalent, content) . . . . . 10 Pounds
   a. Test arena area diameter (yards) . . . . . 100 Yards
   b. Separation from other activities - barrier . . . 500 Feet w/o barrier

4. Explosives Storage Magazine Sites
   a. 2,000 pounds capacity class "A" (TNT or equiv.) explosives - quantity 2
   b. 2,000 pounds capacity class "C" (black power or equiv.) explosives - quantity 1
   c. Separation and barrier from other magazines . . . 140' w/o barrier and 70 with barrier
   d. Separation and barrier from other activities . . 1,010' w/o barrier and 505' with barri

5. Utilities
   a. Non-potable water - gal. per day 1,000
   b. Potable water - gal. per day (fully activated site) 100
   c. Electric power . . . . . 100 KVA
   d. Communication: on site . . . . . Telephone & loud-speaker

      Communication: off site . . . . . Telephone

6. Security, privacy and public relations (and safety) considerations
   a. Barrier against intrusion by "public" . . . . . Artificial barrier
   b. Blast - shock and sound - barrier or separation from "public" . . . . . Natural barrier or 5/8 mile
   c. Fragments and debris - barrier or separation from "public" . . . . . Natural barrier or 500 feet
   d. Smoke and/or fumes - separation distance from "public" . . . . . 5/8 mile

7. Building Sites - Relatively Flat Plots cut from Hillside
   a. Loading and assembly building (contents 100 pounds TNT or equiv.) Barrier and distance from other operations . . . . . Barrier and 190' or no barrier and 380'
   b. Explosive mixing building (contents 100 pounds TNT or equiv.) Barrier and distance from other operations . . . . . Barrier and 190' or no barrier and 380

SITE DATA (Continued)

7. Building Sites (cont.)

   c. Lab/office building (contents 10 pounds TNT or equiv.) Barrier and distance from other operations . . . . . Barrier and 150' or no barrier and 300'

   d. Utility building - no explosives . . . . 1/4 Acre

8. Parking Area - Size and Surface . . . . . 1/2 acre/rock and oil

9. Roadways

   a. Access to site entrance . . . . . 1 lane paved

   b. On-site service roads . . . . . 1 lane paved

10. Fire Hazards . . . . . Devoid of or cleared of combustible material

SCHEDULE OF PROPOSED ACTION:

		E.C.D.
1.	Obtain Ordnance Section's concurrence of plan . . .	7-30-65
2.	Obtain Department Manager's approval of plan . . .	8-02-65
3.	Review site with Riverside Planning Commission . .	8-03-65
4.	Obtain Corporate approval to commit	8-13-65
5.	Negotiate lease for Stringfellow site	8-27-65
6.	Implement site for static tests and test firing . .	10-1-65
7.	Implement site for overflow development work . . .	12-1-65
8.	Implement site for pilot quantity loading	3-01-66

ZONING OF STRINGFELLOW SITE AND PENDING ZONING ORDINANCES:

The property is zoned M-3 which, by present Riverside County ordinances, allows all of the work which we are proposing for this site. We would, of course, be subject to the restrictions of the State Division of Forestry with respect to fire hazards and some clearing would have to be done. This item would be checked out before signing a lease, but it is not felt that extensive expenditures would be required.

The Planning Commission of Riverside County has approved a new ordinance which requires that a variance be obtained in order to do any testing, development, firing, or loading of explosives in any type zoning. The ordinance was to be read at the meeting of the Board of Supervisors on 23 July 1965; the ordinance could be passed by the Board of Supervisors on 30 July 1965, and would then become law on 30 August 1965. The law would not be retro-active in its application to existing facilities.

However, with this ordinance in effect, any new building or additional facilities desired during the period of the lease would require that a new variance be obtained. Thus, if this proposed ordinance is adopted (and dependent on the timing), Nortronics' installation would be subject to a zone variance. Upon management approval of this plan, Plant Engineering will initiate the necessary actions with the Riverside Planning Commission.

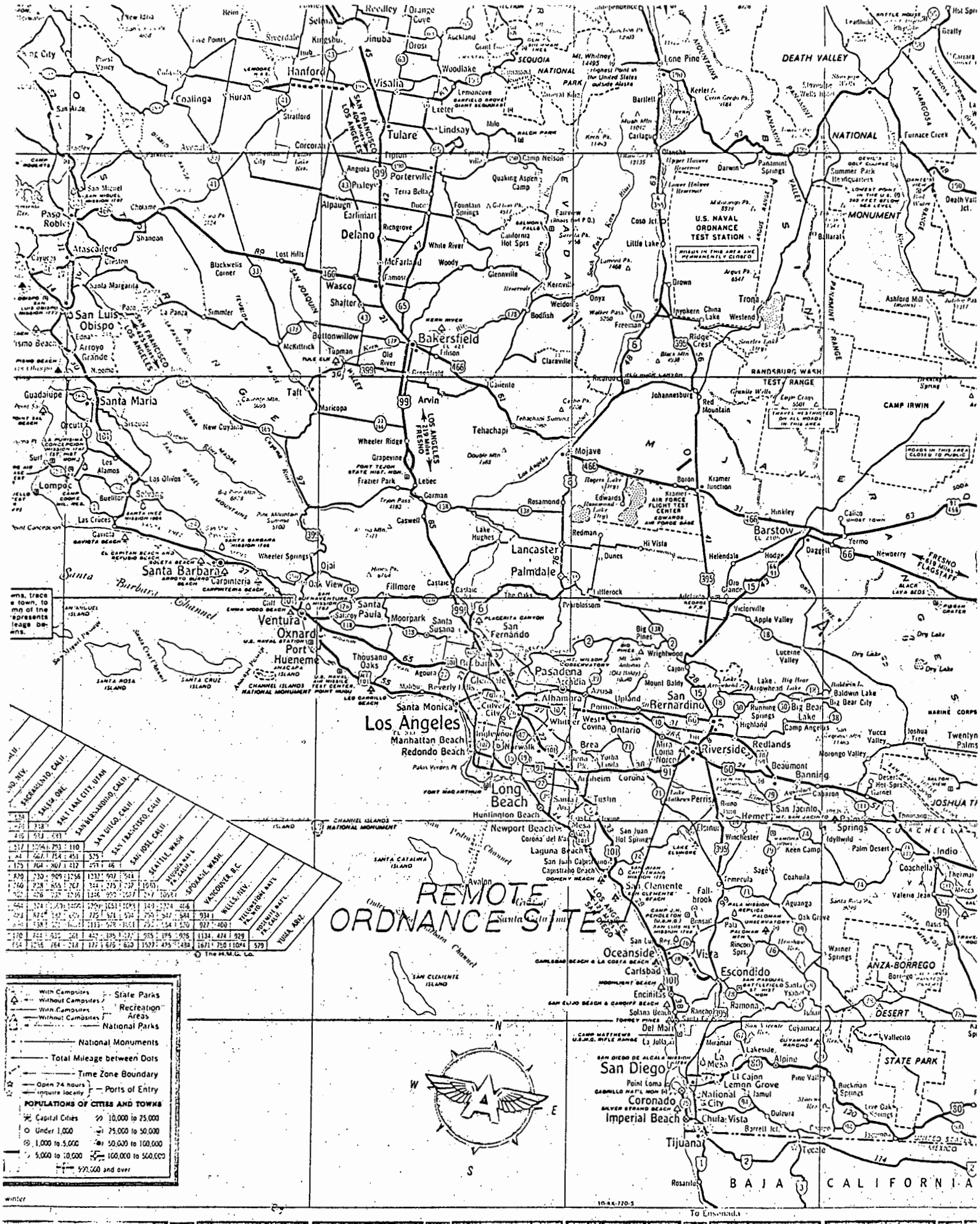
PRELIMINARY LEASE DISCUSSIONS:

The Stringfellow property is available for lease to Nortronics for $400 to $500 per month on an annual lease with options to renew annually for a total period of 15 years. At the expiration of the lease, improvements could be removed or left on the property at the option of the lessee. If any part of an improvement were removed, then the lessor would have the option to request that the complete improvement be removed; e.g., if a building were removed at the option of the lessee, the lessor could require the foundation removed.

In addition, Nortronics would have the right of first refusal to lease two additional parcels of approximately 25 acres each. One of the parcels is presently vacant and unimproved. The other parcel is presently improved with several buildings and is being used for ordnance work. The option on the lease of this second parcel would become valid only if the present lessee gave up his lease.

AVAILABLE FINANCING OF IMPROVEMENTS:

The lessor is willing to finance improvements up to a value of approximately $150,000 and amortize the costs over any reasonable period so long as Nortronics would guarantee to pay the unamortized balance at any time the lease were not renewed prior to completion of payment for the improvements.


REMOTE ORDNANCE SITE
Los Angeles
Santa Barbara
Ventura
Oxnard
Port Hueneme
Santa Monica
Long Beach
Pasadena
San Bernardino
Riverside
Oceanside
Escondido
San Diego
Coronado
Imperial Beach
Tijuana
Bakersfield
Delano
Visalia
Hanford
Tulare
Porterville
Lancaster
Palmdale
Barstow
Mojave
Tehachapi
Arvin
Taft
Lompoc
Santa Maria
San Luis Obispo
Paso Robles
Atascadero
Coalinga
Lone Pine
Trona
Ridge Crest
Johannesburg
Red Mountain
Kramer Junction
Hinkley
Yermo
Newberry
Victorville
Apple Valley
Big Bear Lake
Redlands
Banning
Hemet
Palm Springs
Indio
Coachella
Fallbrook
Vista
Encinitas
Carlsbad
Del Mar
Ramona
Alpine
Lemon Grove
Chula Vista
Tecate
Rosarito
Santa Catalina Island
San Clemente Island
Santa Rosa Island
Santa Cruz Island
Santa Barbara Channel
Channel Islands National Monument
Channel Islands National Park
Sequoia National Park
Death Valley National Monument
U.S. Naval Ordnance Test Station
Randsburg Wash Test Range
Camp Irwin
Anza-Borrego Desert State Park
Baja California
To Ensenada
With Campsites
Without Campsites
State Parks
Recreation Areas
National Parks
National Monuments
Total Mileage between Dots
Time Zone Boundary
Open 24 hours
Inquire locally
Ports of Entry
POPULATIONS OF CITIES AND TOWNS
Capital Cities
Under 1,000
1,000 to 5,000
5,000 to 10,000
10,000 to 25,000
25,000 to 50,000
50,000 to 100,000
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500,000 and over
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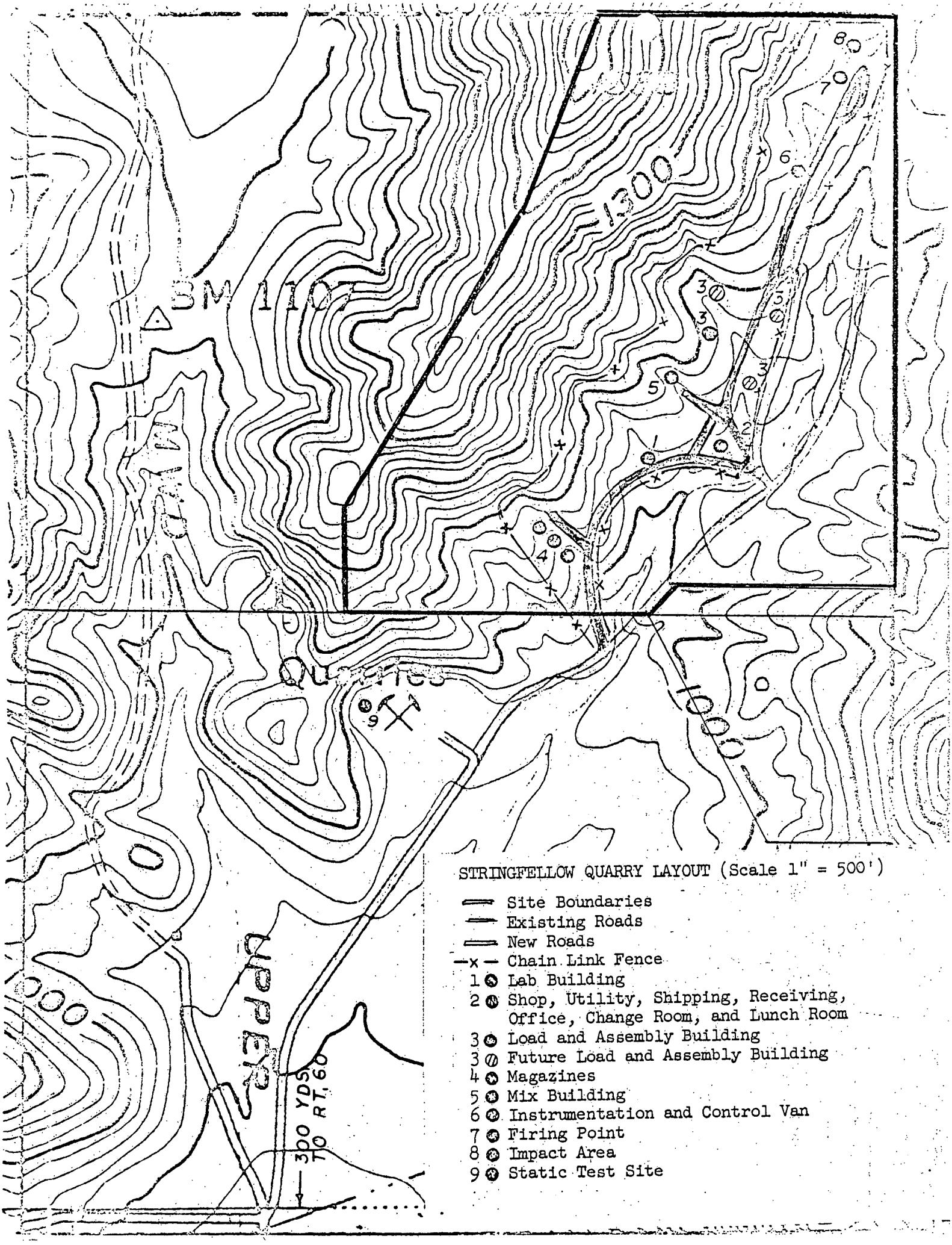
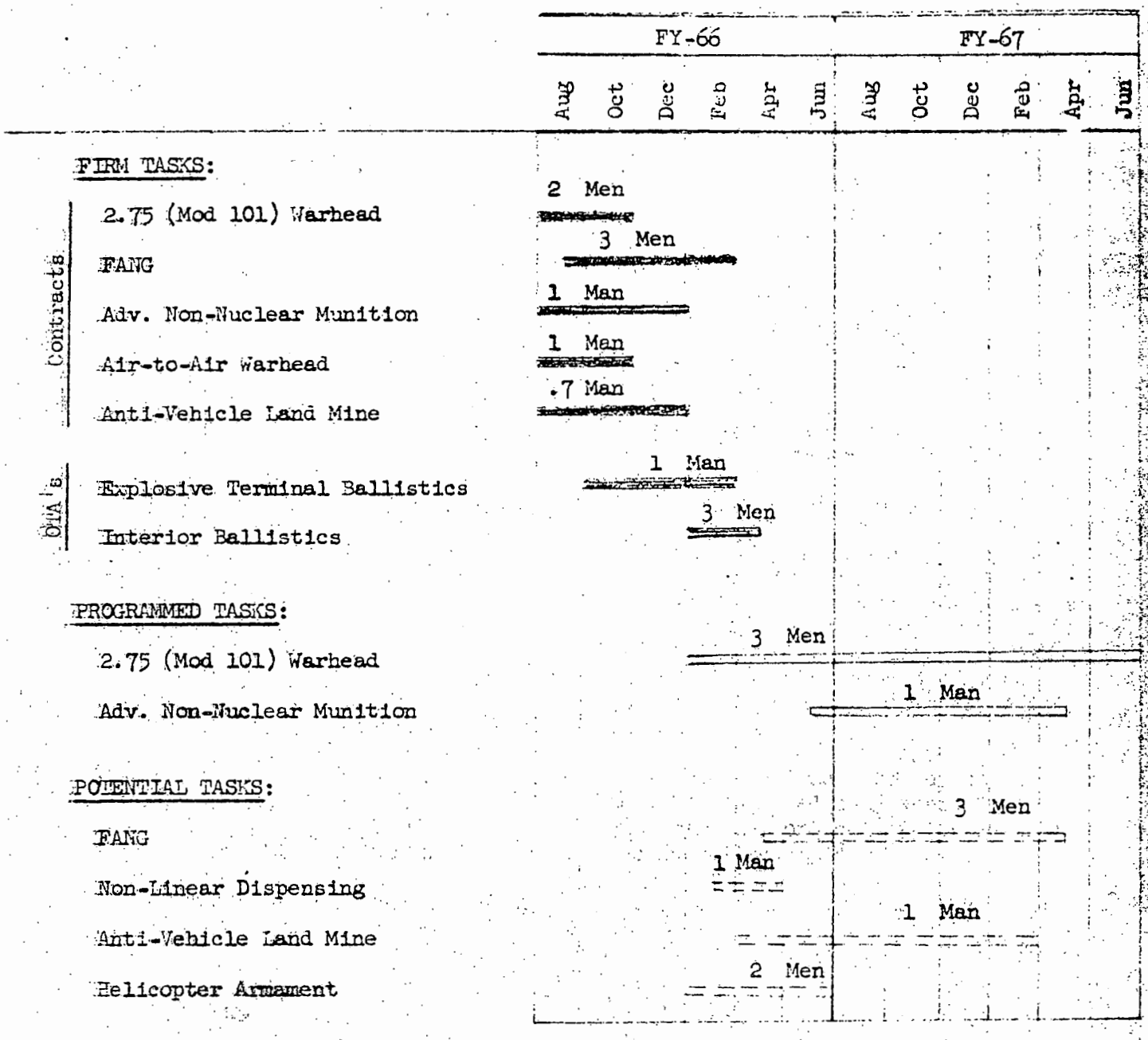


BM 1107
1300
1000
Quarries
UPPER
300 YDS TO RT. 60
STRINGFELLOW QUARRY LAYOUT (Scale 1" = 500')
Site Boundaries
Existing Roads
New Roads
Chain Link Fence
1 Lab Building
2 Shop, Utility, Shipping, Receiving, Office, Change Room, and Lunch Room
3 Load and Assembly Building
3 Future Load and Assembly Building
4 Magazines
5 Mix Building
6 Instrumentation and Control Van
7 Firing Point
8 Impact Area
9 Static Test Site

APPENDIX I

REMOTE SITE UTILIZATION RELATED TO TASKS



APPENDIX II

FACILITY/EQUIPMENT REQUIREMENTS

RELATED TO TASKS

	Static Test Arena	50 Yard Long Firing Range	Instrument and Control Center	Magazine	Loading/Assembly Facilities	Shop/Utility Facilities	Lab/Office Facilities	Propellant-Explosives Mix Facilities	Drop Tower	Jolt-Jumble Tester	Pyro-Processing Equip. (Oven, pump, presses, Impactor)	Centrifuge	Steam Jenny	Utility Truck (Hyd. Tail Gate & A-Frame)	Photo Equip. (Special Cameras and controls, anal. projects)
FIRM:															
2.75 (Mod 101) Warhead	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
FANG	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Adv. Non-Nuclear Mun.	X		X	X	X		X							X	X
Anti-Vehicle Land Mine	X		X	X	X	X	X		X	X				X	X
Explosive Term. Ball.	X	X	X	X	X	X	X							X	X
Interior Ballistics	X		X	X	X		X							X	X
Air-to-Air Warhead	X		X	X	X		X							X	X
PROGRAMMED:															
2.75 (Mod 101) Warhead	X	X	X	X	X	X	X	X	X	X	X	X		X	X
Adv. Non-Nuclear Mun.	X		X	X	X	X	X							X	X
POTENTIAL:															
FANG	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Non-Linear Dispensing	X		X	X		X	X		X	X		X		X	X
Anti-Vehicle Land Mine	X		X	X	X	X	X		X	X				X	X
Helicopter Armament	X	X	X	X	X	X	X	X	X		X	X	X	X	X

APPENDIX III

PREVIOUS TEST PROGRAMS AT GOVERNMENT FACILITIES

Past practice has been to utilize government reservations for ordnance test programs and the following installations have all been used:

Camp Joseph H. Pendleton (U.S.M.C.)
El Toro Marine Air Station
El Centro Parachute Test Facility (U.S. Navy)
Edwards Air Force Base
Mohave "B" Range (under Edwards AFB cognizance)
Naval Ordnance Test Station, China Lake
Holloman Air Force Base, Alamagardo, N.M.)

However, the use of the government facilities has been limited to test firing. None of the above facilities nor Camp Irwin, which is presently being utilized for test firing, will permit development work or prototype loading to be undertaken at the government site.

It is anticipated that the ordnance remote site will be used approximately 90 percent for development work and prototype loading and only 10 percent for test firings.

APPENDIX IV

ORDNANCE SALES FORECAST*

FOR EXISTING CONTRACTS REQUIRING

DEVELOPMENT, TESTING, AND PROTOTYPE LOADING FACILITIES

	FY-65	FY-66	FY-67	FY-68	FY-69	FY-70
2.75 Flechette Warhead	.30M	12.15M		12.00M		
FANG	.42M	.65	1.00M	4.30	10.00M	17.00M
Non-Linear Dispensing	1.00	2.90	.50	2.00	4.00	4.00
Advanced Air Delivered Non-Nuclear Munitions	.48	1.40	1.00	3.00	10.00	10.00
Air-to-Air Warhead Tech.	.20	.20	.20	.50	1.00	1.50
Combat Vehicle Armanent Study	.25	.42	2.00	5.00	10.00	10.00
Anti-Vehicle Land Mine	.32	.30	1.00	1.50	1.50	1.00
Totals:	2.97M	18.52M	5.70M	28.30M	36.50M	43.50M

Six Year Total: 135.49M**

* Source: Marketing survey and program plan for Ordnance Systems, dated 7-23-65.

** Failure to acquire a remote site will not only compromise these programs, but will significantly affect the acquisition of additional programs not identified.

NORTHROP

Northrop Corporation
One Northrop Avenue
Hawthorne, California 90250-3277

128:NLS:88-3

April 12, 1988

Henry A. Forgione
Munger, Tolles & Olson
355 South Grand Avenue
Thirty-fifth Floor
Los Angeles, CA 90071-1560

Dear Mr. Forgione:

This letter is in response to your letter, dated April 5, 1988, regarding a set of handwritten notes recorded in 1982 and 1983. A copy of the notes was attached to your correspondence.

The notes (with the exception of a diagram of the Stringfellow site provided by Mr. J. Reed during an interview) were taken by me. I am not an attorney, however. I took the notes in the capacity of Manager, Environmental Control at Northrop's Electro-Mechanical Division. The notes were taken under the advice of Northrop's in-house counsel as a part of a search for Northrop persons knowledgeable about the Stringfellow site.

Sincerely,

4/13/88

Norman L. Sealander
Corporate Environmental
Control Administrator

NLS:jid

bcc: Gary Serio
Larry Steckmest

8/19/83 Interview Summary

Taylor Myers, Process Engineer, Orgn. 6111 XT 361

- Chemical Process Engineer at NEMD from 1955 to present

- Processes during Stringfellow Years -
  - Chemical Etching
  - Cadmium Plating
  - Black Oxide on Steel
  - Anodizing
  - Iridite
  - Zinc Phosphate
  - Chromate Conversion

Processes were engineered and established using the Handbook of Plating and Metal Finishing as a rough guide. Taylor stated that he will provide a Handbook and indicate specific processes.

- Products during Stringfellow years
  - Hawk Loader and Launcher
  - Fire Control Systems
  - Ordinance / Flechettes

(CONT'D)

8/19/83

Taylor Myers interview (CONT'D).

- When Taylor viewed data presented to EPA resulting from original EPA questions, he stated that the quantities seemed excessive in view of operations ongoing at the time.

- Other sources of information

- Bernard Shay	- may have old process specifications and manuals
- Library	- may have old Milspecs
- Process Engr Control Orgn	- may have old process specifications
- Paul Staudemeyer Retired Spokane, Wash	- Process Engineer on 2nd Shift during Stringfellow Years

8/3/83 Interview w/ Gene Kennedy, IRM Records Retention

- Record Mgmt Procedures available from IRM
- ☆ Old telephone books available in his desk
- ☆ Provided copies of all records request and retention standard forms
- ☆ Provided Record Management Procedure (RMP) 1-10 dtd 8/1/70 and RMP 1-11 dtd 10/12/70

7/27/83

Interview Preliminary Questions

1. Full name
2. Business and residence address and telephone #.
3. Employer, and employer's name, address and telephone #.
4. Position and occupation
5. Membership in professional organizations, professional societies and trade associations
6. If incorporated, state of incorporation and the address and telephone # for its principal place of business and for each parent and subsidiary.

7/27/83

<u>Interviews</u> – Recommended Under Attorney/Client Relationship

- Taylor Meyers / Process Engineer, Chemist. Familiar with NEMO processes during Stringfellow years.
  XT 361
- Jack Blonk / Manager, Procurement
  XT 574
- Larry Law / Worked at Stringfellow site when leased by Northrop
  XT 1169
- Jerry Reed / Worked at Stringfellow site when leased by Northrop
  XT 695
- Bill Perkins / Current and past responsibility for haz. waste hauler contact and manifest system.
  XT 1040
- Art Boston / Former Manager, Plant Maintenance. Overall knowledge of haz. waste disposal during Stringfellow years.
- Merril Skilling / Retired. Former Manager, Plant Engineering. Overall knowledge of haz. waste disposal during Stringfellow years.

- Bill Brackney / Manager, Info. Resource Management
  XT 1314 / Responsible for Record Retention Center

- Dave Belcher / Worked at Stringfellow Sit.
  XT 605 / Provided Site photographs, and is willing to correlate photographs w/ plot plan.

- Jim Hawk / Recommended by Dave Belcher.
  NAD, XT 3773 / Had some sort of management responsibility for NEMD operations at Stringfellow.

- Bob Lawther / Recommended by Dave Belcher
  NEMD Offsite Ops.
  XT 3100

- Ed Hoffmeyer / Mgr, Industrial Engineering during Stringfellow Years.
  Retired

7/27/83

Records Search

- Interview Jack Blonk to determine
  - Procurement System specifics (e.g., records retention requirements, chemical procurement processes, etc..)

- Interview Bill Brackney to determine
  - Records retention specifics (most efficient way to locate and retrieve)

7/28/83

Interview: Jack Blonk

Records Availability

- 1982 = 14,000 P.O.'s. ≈360,000 since 1950
- PRIS System - historical record of all buys made against production orders. Records available from 72-73 timeframe to present.
- Buyer Logbooks - Available for approximately 10 yrs. back, but gaps could exist.
  PO# | SO# | Quantity | Descript. | Price | Due | Delivered
- Buyers
  Jack Smith
  Virginia Johnson (retired)
  Ralph Hamrick (retired, possibly deceased)
  Greg Haydu
- Stock Buy & History Cards (Blue)
  Stock Blanket Reorder Cards
  Possibly available from mid-60's to present
- Other Sources of Info:
  Jack Smith
  Bill Perkins
  Diane Milner
  Bob Lambdin

7/28/83

Interview: Bob Lambdin

- Advised to not destroy any records due to litigation.

7/6/83

Stringfellow Litigation

- Ed Schwarze, Manager
  Process Engineering and Control
  - + Dick McMillan, Previous Mgr
  - + Other Previous Managers and Supervisors, including
    - Dave Bliss (retired)
      author of original MP-73
- Bob Lambdin, Supervisor & Diane Milner, Manager
  Material Stores
  - + Previous Supervisors, including
    - Bill Perkins, who has handled haz. waste manifesting for the last few years
- Merrill Skilling, Retired

  Manager of Plant Eng. & Plant Maintenance during Stringfellow years. Personally acquainted w/ Mr. Stringfellow.
- Art Boston

  Maintenance Supervisor, dealt w/ waste disposal during Stringfellow years
- Chuck Dolan, Contracts
  John Boreland, Contracts
  Provided original lease for property

9/1/82

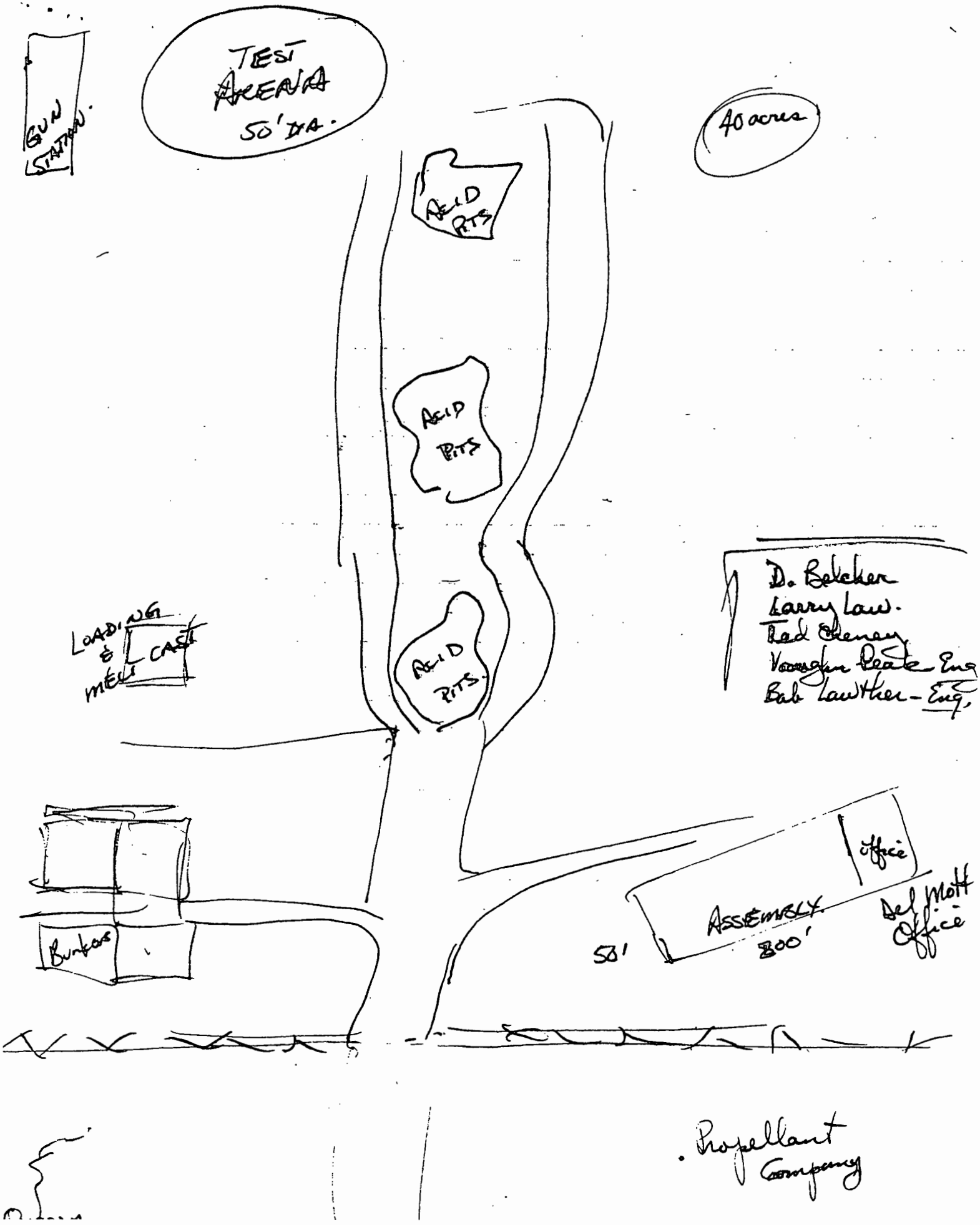
POSSIBLE CONTACTS

Name	Ext./Nr.	Retired?	Interviewed?
Burl Ervin			
Bob Lawther	1301 (Y13)	NO	
Charles Stevens	1256	NO	YES —
Charles Bernard	1034	NO	YES
Merrill Skilling	(714) 642-3214	YES	YES (by telephone)
Don McInnis	633 (YK)	NO	YES
Jerry Reed		NO	YES
Larry Law	1169	NO	YES —
Dave Belcher	605	NO	YES —
Ted Cheney	496	NO	
Vaughn Peak	1271	NO	
Del Mott	(714)772-4103	YES	YES (by telephone ~~apparently~~)
Charles Dolan	1265	NO	YES
Ed Hofmayer			
Tom Kew			

9/2/82

INTERVIEW SUMMARY – JERRY A. REED / ORGN. 8270 / EXT. 695

- Northrop operations conducted on Stringfellow site during ≈ 62/63 – ≈ 72/73.
- Operations consisted of small at medium size ordinance loading and testing
- No disposal of ordinance residue, liquid wastes, or any other wastes onsite recalled by Mr. Reed.
- McCormick-Self (headquarted in No. Calif.), an ordinance manufacturing company, operated a plant on Stringfellow's land.
- Stringfellow used his land for multiple purposes, including:
  - Stringfellow construction operations
  - Stringfellow quarry operations
  - Lease to Northrop for ordinance assembly & test
  - Lease to McCormick-Self for ordinance assembly
  - Lease to a propellant company
  - Liquid waste disposal in three "acid pits".
- Above operations conducted on approx. 500 acres of land. Northrop leased approx. 40 acres of land. Acid pits were located in the center of Northrop operations, but Northrop was in no way associated with acid pit operations.
- Rough layout of Northrop operations, sketched by Mr. Reed, is attached.
- Buildings were transferred to Mr. Stringfellow's ownership after Northrop operations were completed.


GUN STATION
TEST ARENA 50' DIA.
40 acres
ACID PITS
ACID PITS
ACID PITS
LOADING & MELT CAST
D. Belcher
Larry Law.
Red Cheney
Vaughn Peale Eng
Bob Lawther - Eng.
Bunkers
office
ASSEMBLY 800'
50'
Del Mott Office
Propellant Company

9/2/82

INTERVIEW SUMMARY – LARRY B. LAW/ORGN. 7510/EXT. 1169

- Stated that he worked at the Stringfellow site during entire timeframe of operations.
- Stated that he knew Mr. Stringfellow personally, and that he was a very cooperative landlord.
- Stated that Northrop never, to his knowledge, disposed of any waste in the acid pits.
- Stated that trucks disposed of waste constantly, and that drivers were required to place slips of paper in a small box adjacent to the acid pits prior to dumping.
- Stated that the acid pits caught on fire 2 or 3 times.
- Stated that Stringfellow added detergent to the acid pits at one time, and that this caused agitation in the pits and that the pits began leaking downslope.
- Stated that the above incident brought Stringfellow to the attention of authorities, and the acid dumping business was suspended shortly thereafter.

9/2/82

INTERVIEW SUMMARY – CHARLES A. DOLAN/ORGN. 3200/EXT. 1265

- Contacted John Boreland, who was able to locate the lease agreement package.
- Suggested I contact Ed Hofmayer and Tom Kew (retired).
- Suggested the following people might be helpful:

  Jerry Jerger (Retired) – Mgr. of Ord. Engineering during timeframe.

  Tom Tucker (Retired)

  Ernie Hill (Retired)

9/2/82

INTERVIEW SUMMARY – DAVE BELCHER/ORGN. 6224/EXT. 605

- Stated that Northrop did not administer or contract any operations in the Acid Pit area.
- Stated that no solid or liquid waste was ever disposed of by Northrop in the Stringfellow acid pits.
- Described the site accurately.

9/2/82

1913 W. Bayport Circle
Anaheim, Ca.

INTERVIEW SUMMARY – DEL MOTT/RETIRED/714-772-4103

- Stated that he managed all operations at the Stringfellow site during entire timeframe of operations.
- Stated that all trash was routinely removed or incinerated.
- Stated that at no time did Northrop ever engage in dumping solids or liquids in the acid pits.
- ☆ Stated that Northrop fencing did not surround acid pits.
- Stated that he has an aerial photograph of the site. After I arranged to borrow the photo and made an appointment to pick it up today, he called Chuck Stevens to relay to me that he could not locate the photo today.
- Stated that Stringfellow installed aeration equipment to facilitate evaporation in the acid pits. This resulted in considerable corrosion of Northrop installed facilities.
- Stated the he and perhaps other employees became ill after aeration process started.

9/2/82

INTERVIEW SUMMARY – CHARLES STEVENS / ORGN. 7510 / EXT. 1256

- Visited Stringfellow site several times.
- Stated that waste disposal operations were conducted entirely by Stringfellow.
- Suggested contact Del Mott.

9/2/82

INTERVIEW SUMMARY - CHARLES L. BARNARD / ORGN. 6600 / EXT. 1034

- No direct knowledge of activities onsite at Stringfellow. Assigned to project after total operations located at Fort Erwin.

- Recommended contact Larry Law.

9/2/82

INTERVIEW SUMMARY — DONALD A. McINNIS/N.S.I. ORGN. 1000/EXT. 633

- No direct knowledge of activities onsite at Stringfellow. Assigned as NEMD V.P., Operations, after Stringfellow operations terminated.

9/2/82

INTERVIEW SUMMARY - MERRILL SKILLING/RETIRED/714-642-3214

- Mr. Skilling stated that he was in charge of Plant Eng. and Maintenance during the timeframe of Northrop's operations on Stringfellow's land.
- Mr. Skilling stated that no waste chemicals, explosives, or any other material were disposed of on Stringfellow land by Northrop Corp., Electro-Mech. Division.
- Mr. Skilling stated that he would have been officially aware of any such disposal action.
- Mr. Skilling stated that he would certify officially that his statements are absolutely true.

Exhibit E

Facility Operating Procedures and Test Results

NORT 66Y335

ORDNANCE TEST

AND LABORATORY

EQUIPMENT HANDBOOK

J. W. Hock for

E. B. Chambers, Supervisor
Ordnance Test Unit

J. D. Watson, Chief
Project Support Group

NORTRONICS, A Division of Northrop Corporation
500 East Orangethorpe Avenue
Anaheim, California

1 January 1967

The objectives of this handbook were:

1. To provide at a single source, the equipment and facilities available to Ordnance Test and Laboratory personnel.

2. Incorporate brief notations, limiting factors and significant parameters regarding the equipment and facilities.

3. To serve management as a tool for reviewing existing equipment and provide justification for additional facilities.

4. To provide a useful supplement for the facilities and equipment sections of proposals.

The following table of contents indicates under "Nomenclature" the general presentation of the equipment. "Category" is expected to serve as a convenience to the user. The "Code" was generated for convenience in and serves as a numerical index.

NOMENCLATURE	CATEGORY	CODE	PAGE
GENERAL MECHANICAL EQUIPMENT (accumulators, dial indicators, trucks)	MECHANICAL	101	1 - 7
HYDRAULIC EQUIPMENT-NO EXTERNAL POWER (hydraulic cylinders, gages, jacks)	MECH./HYD.	102	8 - 10
POWER TOOLS (drill motors, lathes, power saws)	MECH./ELECT.	103	11 - 15
MECHANICAL/AIR EQUIPMENT (barometers, manometers, psychrometers)	MECH./AIR	104	16 - 17
FLUID EQUIPMENT (fire extinguishers, fluid flowmeters)	FLUID	105	18
AIR EQUIPMENT (anemometers, air flowmeters)	AIR	106	19
ELECTRICAL POWERED HEAVY EQUIPMENT (ovens, refrigerators)	ELECTRICAL	107	20 - 21
PHOTOGRAPHIC EQUIPMENT (cameras, lenses, controls)	PHOTOGRAPHIC	108	22 - 25
ELECTRONIC EQUIPMENT (accelerometers, counters, galvanometers)	ELECTRONIC	109	26 - 58
ELECTRICAL OPTICAL EQUIPMENT (microscopes, photofluorometers)	ELEC./OPTICAL	110	59
SEMI-FIXED EQUIPMENT (cabinets, trailers)	LAB. FACILITIES	111	60 - 61

The electronic items in the handbook utilize descriptive data found in Metrology Records. Some items in the handbook have no descriptive data and where this occurs, reference is made to Metrology Records.

MECHANICAL

CONTROL NO.	NOMENCLATURE	MANUFACTURER	MODEL/TYPE	FACILITY	CODE
OL-124	ACCUMULATOR, HYD. Storage, 3000 psig. 21"x3¼ dia. 3/4 & 3/8 I.D. Con.	BENDIX	S/N 791198A	Y2TS Anah	101
OL-23	ACCUMULATOR, HYD. Storage, 3000 psig. 7½" dia. 2-3/4" I.D. Pipe Con.	BENDIX	S/N 12	Y2TS Anah	101
	BALANCE, 80 gm. Accuracy ±.1 mg. 19" long, 10" wide, 18" high	METTLER INSTR.	H16	Y7 Anah	101
	BALANCE, 200 gm. Accuracy ±.02 mg. 19" long, 10" wide, 18" high	METTLER INSTR.	B5-H-26	Y7 Anah	1[illegible]
ACL-81954	BALANCE, 1 mg-200 gm. Accuracy ±.1 mg. 19" long, 10" wide, 18" high	METTLER INSTR.	B5 (2 ea.)	Y7 Anah	101
ACL-82534 ACL-82537	BALANCE, TRIPLE BEAM, 1-610 gms. 9" long, 3¼" wide, 7" high	SARGENT	S 3450 (2 ea.)	Y7 Anah	101
ACL-82512	BALANCE, TRIPLE BEAM, 1-21100 gms. Acc. ±.5 gms. 34" long, 12" wide, 10" high	OHAUS	1119	Y7 Anah	101
ACL-82267	BALANCE, 25kg - 50# Accuracy 60 mg.-1 gr.	W & LeGURLEY	9570	Y1 Anah	101
LACD-14530	BALANCE, Analytical Precision Weighing Accuracy .001 gm.	CHRIS-BECKER	AB2	HOLLOMAN	101
ACL-82284	BALANCE, PRESSURE, FLOATING PISTON 5,000-100,000 psig.	AMINCO	47-2221	Y1 Anah	10[illegible]
ACL-82536	BALANCE, TORSION, 200 gm. Accuracy ±.005 12" long, 5" wide, 7" high	TORSION BALANCE CO.	DWL-3		101
NC-44917	BOX, STEEL, DETONATOR STORAGE, 18"x18"x18", ¼"Wall	EORTRONICS		Y7 Anah	101
LACD-11718	CALIBRATOR, TORQUE, 2940 in.lbs. Calibrate Torque Qrenches. Adapters ¼", 3/8", ½", 5/8", 3/4" sq. dr., Accuracy 1 in.lb. full scale 3½" long, 1" wide, 1" high	AM SCALE		Y1 Anah	101

	DERMITRON	UNIT PROCESS	D2		101
LAOD 18455	DROP TABLE -SHOCK TABLE-TESTS Floor mounted 1' long, 2/3' wide, 6½' high		Jan. 5, 1944	Y2TS Anah	101
LAOD 18398	DYNAMOMETER	MACTROL INC.	170	Y1 Anah	101
OL- 26	DYNAMOMETER, 20,000# CAP. ACCURACY 2% 9" long, 3½" wide, 7½" high	DILLON	S/N 26212	Y2TS Anah	101
OL-27	DYNAMOMETER, 5000# CAP. ACCURACY 5%, 9" long, 3½" wide, 7½" high	DILLON	S/N 26228	Y2TS Anah	101
OL-28	DYNAMOMETER, 1000# CAP. ACCURACY 3%, 9" long, 3½" wide, 7½" high	DILLON	S/N 26333	Y2TS Anah	1
OL-29	DYNAMOMETER, 30,000# CAP. 12" long, 12" wide, 7" high	DILLON	S/N AN 31252	Y2TS Anah	101
	GAGE, HEIGHT, ELECTRONIC .2000 Max. range 12" long, 12" wide, 8" high, 2' stand	SHEFFIELD	GM 174		101
	GAGE, HEIGHT, ELECTRONIC ±.5 range 12" long, 12" wide, 8" high, 2' stand	SHEFFIELD	GM 252		101
	GAGE, HEIGHT, ELECTRONIC ±.001 range 12" long, 12" wide, 8" high, 2' stand	SHEFFIELD	GM 251		101
NAl 37161	GAGE TESTER, DEADWEIGHT, Set in 3 boxes. Weights are 18 ea. 500# 3 ea. 200# 2 ea. 100#, 3 ea. 50#	ASHCROFT (Manning, Maxwell & Moore Inc.)	1313A S/N 657100	Y2 Anah	101
OL- 59	GAUGE TEST	ASHCROFT			101
LAOD- 14197	GRINDER/BUFFER, 2 Wheel 115 VAC, 5.6A, 50-60 cycle, Floor mounted 21" long, 27" wide, 48" high	STANLEY ELECT. TOOLS	257A	Y2TS Anah	101
GFE- 682	GUN, 40 mm.		M-1 S/N 35410	Y2 Anah	101
OL- 143	GUN, HOWITZER, 105			FT. IRWIN	101

NAL- 36947	HOIST, CHAIN BLOCK 1 Ton Capacity	YALE & TOWNE		Y2 Anch	101
OL- 37	INDICATOR, DIAL GRAD.-.001 Dial 0-10 RANGE 1.00	FEDERAL PRODUCTS CORP.	C 81 SC	Y2 Anah	101
OL- 38	INDICATOR, DIAL GRAD.-.001, Dial 0-10 RANGE 1.00	FEDERAL PRODUCTS CORP.	C 81 SC	Y2 Anah	101
OL- 39	INDICATOR, DIAL GRAD.-.001, Dial 0-10 RANGE 1.00	FEDERAL PRODUCTS CORP.	C 81 SC	Y2 Anah	101
OL- 33	INDICATOR, DIAL GRAD.-.0001, Dial 0-10 RANGE .200	STARRETT	Cat.# 25-611	Y2 Anah	101
OL- 34	INDICATOR, DIAL GRAD.-.0001, Dial 0-10 RANGE .200	STARRETT	Cat.# 25-611	Y2 Anah	101
OL- 35	INDICATOR, DIAL GRAD.-.0001, Dial 0-10 RANGE .200	STARRETT	Cat.# 25-611	Y2 Anah	101
OL- 36	INDICATOR, DIAL GRAD.-.0001, Dial 0-10 RANGE .200	STARRETT	Cat.# 25-611	Y2 Anah	101
	INDICATOR, SURFACE. MEASURE SURFACE FINISHES. Range1-1000 microinches, 100-125 VAC, 60 cyc. 3 ld. Twist con.	BRUSH INSTRUMENTS	BL 110 (2 ea.)		
	INDICATOR SURF	BUSH INSTRUMENTS	BL 185		101
OL- 120	LAUNCHER, ROCKET, UNIVERSAL 6 tube on 2 1/3' x 12' base, adjustable elevation	NORTRONICS		Y7 Anah	101
OL- 144	LAUNCHER, 2.75 ROCKET, 18' long, with stand	NORTRONICS		Ft. Irwin	101
OL- 48	PIC DESIGN SET	PIC DESIGN CORP.		Y2TS Anah	101
OL- 122	POD LAUNCHING. STEEL TUBE 5' long, 6¼" O.D., 4¼ I.D. 2" restrictor on one end. Mounted horiz. on movable stand	NORTRONICS		Y7 Anah	101
OL-104	POT, MELTING, 6# CAP. Liq. Heating-max 250°C, Melting explosives, 115 VAC, 4A, 3 ld. twist con. 20" long, 12" wide, 20" high	NORTRONICS		Y7 Anah	101
LAOD 11453	PRESS, MANUAL, 4" Stroke, Floor mounted. 8" long, 7" wide, 10" high	FANCO	A	Y7 Anah	101

OL- 108	PRESS, MANUAL, 4" Stroke, 9½" long, 8" wide, 13" high	DAKE	X	Y7 Anah	101
OL- 109	PRESS, MANUAL, 4" Stroke, Bench mounted 10" long, 7" wide, 12" high	FAMCO	0	Y7 Anah	101
OL- 110	PRESS, MANUAL, 4" Stroke, Bench mounted 9½" long, 8" wide, 13" high	DAKE	X	Y7 Anah	101
OL- 86	PRESS, MANUAL, For detonators & primers, 3/4" stroke, Bench mounted 16" long, 10" wide, 20" high	DAKE	0	Y7 Anah	101
OL- 87	PRESS, MANUAL, SHIELDED 10" Stroke, Floor mounted 18" long, 13" wide, 20" high	DAKE	0	Y7 Anah	101
LAOD-11475	PRESS, MANUAL, 12" Stroke, Floor mounted, 18" long, 13" wide, 60" high	FAMCO	38	Y7 Anah	101
NC-44899	PRESS, MANUAL, 8" Stroke, Dead Wt. 20" long, 12" wide, 27" high	DAKE	1	Y2 Anah	101
NC-44900	PRESS, MANUAL, PRESS explosives, shielded, 8" Stroke, Bench mounted with floor supports 21" long, 14" wide, 27" high	DAKE	1	Y7 Anah	101
OL- 92	RELOADING KIT, UNIVERSAL, MANUAL, CARTRIDGES & PRIMERS, 30/06	C-H DIE CO.	2	Y7 Anah	101
OL- 85	SCALE, BALANCE, 500 mg. Cap., 6½" long, 13" wide, 10½" high	FEDERAL PACIFIC CO.	705917	Y7 Anah	101
ACL 81955	SCALE, BALANCE, 500 mg. Cap., 6½" long, 13" wide, 10½" high	FEDERAL PACIFIC ELECT.	705909	Y7 Anah	101
ACL 82526	SCALE, BALANCE, 2610 mg. Cap., 17" long, 6½" wide, 6" high	OHAUS SCALE CO.	750-3 2610	Y7 Anah	101
ACL 82527	SCALE, BALANCE, 311 gm. Cap., Triple beam, 14½" long, 5" wide, 12" high	OHAUS SCALE CO.	CG 311	Y7 Anah	101

ACL 82528	SCALE, BALANCE, 20 Kg Cap., Triple beam, 34" long, 12" wide, 10" high	OHAUS SCALE CO.	1119S	Y7 Anah	101
ACL 82534	SCALE, BALANCE, 200 gm. Cap., 9" long, 3¼" wide, 7" high	E. H. SARGENT & CO.	10S 862	Y7 Anah	101
ACL 82869	SCALE, BALANCE, 5# Cap., 2KG, triple beam. 14" long, 6" wide, 8" high	OHAUS	S-3227	Y7 Anah	101
ACL 82611	SCALE, PLATFORM 1000# Capacity	FAIRBANKS-MORSE	CODE 1124, S/N G 367336	Y2 Anah	101
OL-141	SCALE, SPRING, 160# Cap. 13" long, 3½ wide, 2" high	HANSON VIKING	8916	Y2TS Anah	101
OL-31	SCALE, SPRING, 200# Cap., 13" long, 3½" wide, 2" high	HANSON	8920	Y2TS Anah	101
OL-32	SCALE, SPRING, 50# Cap., 8" long, 2" wide, 2" high	HANSON	895	Y2TS Anah	101
OL-30	SCALE, SPRING, 5# Cap., 8" long, 3" wide, 3" high	HUNTER SPRING CO.	L5M	Y2TS Anah	101
OL-174	SCREWPLATE, TAP & DIE HANDLES NF&NC ¼, 5/16, 3/8, 7/16, ½, 9/16, 5/8 & 3/4", 30" long, 11" wide, 1½" high	GREENFIELD TAP & DIE	LITTLE GIANT	Y7 Anah	101
	SHOTGUN, PUMP, 12 ga. BARRELS-5 riot short, 2 rifled slug short, 1 rifled slug spec. long	REMINGTON	870	Y7 Anah	101
	SHOTGUN, AUTOMATIC, 12 ga. Barrels-1 full ch, 1 imp. cyl.	WINCHESTER	1400	Y7 Anah	101
	STATION WAGON	WILLYS	JEEPSTER 1967		101
NC-056333	STERILIZER, FREE STEAM, COPPER-DOUBLE WALL I.D. 15"x12"x12"	WAHMANN MFG. CO.		HOLLOMAN	101
NC-44887	STRUCTURE, STEEL, STATIC TEST, MAIN ST. 12' long, 10' wide, 10' high Sec. St. 3 I beams above	NORTRONICS		Y2 Anah	101
OL- 93	SURFACE PLATE, ROCK 18"x24"			Y7 Anah	101

OL- 58	SURFACE PLATE, STONE 18"x18"	HERMAN STONE CO.	11443	Y2TS Anah	101
ORD 50716	TESTER, THICKNESS, COATINGS. 7"x7"x7"	AMINCO	NRL-1 (2 ea.)	Y1 Anah	101
ACL 82873	TESTER, TORQUE, 2940 in lbs., 36" long, 8" wide, 14" high	AM SCALE			101
LAOD-10271	TACHOMETER, 30-12000 rpm	HERMAN H. STICHT CO.	S/N 518403	Y2TS Anah	101
NC-056432	TRAILER VAN				101
GFP-117	TRUCK, 2½ Ton, 6x6	REO	M36C P/N USA 4A2412	Y2 Anah	101
	TRUCK, PICKUP, 4 Wh. Dr., 3/4 ton	GMC	1967	Y7 Anah	101
NORT3-1	TRUCK PICKUP	GMC		Y7 Anah	101
	TRUCK, WEAPONS CARRIER, ½ ton	DODGE	1954	Y7 Anah	101
N 12241	TUBE BENDER, TUBE O.D. CAP. 1/8"-1/2", Die Sizes 3/8" O.D.x3/4"R. 1/4"O.D.x 3/4"R, 1/4"O.D.x1"R, 1/4"O.D.x1 5/16"R, 3/8"O.D.x1"R, 3/8"O.D.x1 1/4"R.			Y2TS Anah	101
ACL 83152	WEIGHT, MASS STD. 1 kg, Vol. 127-212 CC.	NORTRONICS	CLASS M	Y1 Anah	101
ACL 83366	WEIGHT, METRIC, 1 gm-2000	BRAUN CORP.	12720	Y1 Anah	101
	WEIGHT. SET, 1-100 gm	CHRIS-BECKER	CLASS S1 (2 ea.)	Y1 Anah	101
	WEIGHT SET, 1-10 gm	AINSWORTH	MOD S (2 ea.)	Y1 Anah	
	WEIGHT SET, 1-100 gm.	AINSWORTH	MOD M (3 ea.)	Y1 Anah	101
ACL 83314	WEIGHT SET, AVOIR. 1/16, 1/8, 1/4, 1/2 oz. 9½" long, 3'" wide, 4" high	BRAUN CORP.	12936	Y1 Anah	101
ACL 82870	WEIGHT SET, 1-1000 gm. 9½" long, 3½" wide, 4" high	OHAUS	5213	Y7 Anah	101
ACL 82324	WEIGHTS, 1000 gm.	W & LeGURLEY	5222	Y1 Anah	101
ACL 82251	WEIGHTS, 10 mg - 100 mg	SEED-KOHLBUSH	S650	Y1 Anah	101

MECH./HYD.

CONTROL NO.	NOMENCLATURE	MANUFACTURER	MODEL/TYPE	FACILITY	CODE
OL-75	CYLINDER, HYD., STATIC LOADING, 4"dia.,14½" stroke.	BRUNING		Y2TS Anah	102
OL-18	CYLINDER, HYD. STATIC LOADING 2" dia., 14" stroke, 3000 psig.	NASCO		Y2TS Anah	102
OL-19	CYLIEDER, HYD., STATIC LOADING. 1½" Dia., 8" stroke, 3000 psig.			Y2TS Anah	102
OL-21	CYLINDER, HYD., STATIC LOADING. 3" dia., 6" stroke, 3000 psig.	BEATER PRODUCTS	S/N 2	Y2TS Anah	102
OL-22	CYLIEDER, HYD., STATIC LOADING. 2" dia., 12" stroke, 3000 psig.	NORAIR	S/N 131	Y2TS Anah	102
OL-01	CYLINDER, HYD., STATIC LOADING. 3½" dia., 16" stroke, 3000 psig.	BLACKHAWK CO.		Y2TS Anah	102
OL-02	CYLINDER, HYD., STATIC LOADING. 3½" dia., 10" stroke, 3000 psig.	BLACKHAWK CO.		Y2TS Anah	102
OL-03	CYLIEDER, HYD., STATIC LOADING. 3½" dia., 10" stroke, 3000 psig.	BLACKHAWK CO.		Y2TS Anah	102
OL-04	CYLIEDER, HYD., STATIC LOADING. 2½" dia., 10" stroke, 3000 psig.	BLACKHAWK CO.		Y2TS Anah	102
OL-05	CYLINDER, HYD., STATIC LOADING. 2½" dia., 10" stroke, 3000 psig.	BLACKHAWK CO.		Y2TS Anah	102
OL-06	CYLIEDER, HYD., STATIC LOADING. 2½" dia., 10" stroke, 3000 psig.	BLACKHAWK CO.		Y2TS Anah	102
OL-07	CYLINDER, HYD., STATIC LOADING. 2½" dia., 10" stroke, 3000 psig.	BBLACKHAWK CO.		Y2TS Anah	102
OL-08	CYLINDER, HYD., STATIC LOADING. 1½" dia., 8" stroke, 3000 psig.	BLACKHAWK CO.		Y2TS Anah	102
OL-09	CYLINDER, HYD., STATIC LOADING 1½" dia., 9" stroke, 3000 psig.	BLACKHAWK CO.		Y2TS Anah	102

OL-10	CYLINDER, HYD., STATIC LOADING. 1½" dia., 9" stroke, 3000 psig.	BLACKHAWK CO.		Y2TS Anah	102
OL-40	GAGE, PRESS., 30 psig. 5" Dial, ½" O.D. Pipe Con.	ASHCROFT		Y2TS Anah	102
OL-42	GAGE, PRESS., 75 Tons, 6" Ram 3 3/4" Dial, 3/4" O.D. Pipe Con.	U. S. GAUGE CO.		Y2TS Anah	102
OL-43	GAGE, PRESS., 15 psig., 4½" Dial, ½" O.D. Pipe Con.	JAS. P. MARSH CORP.	103	Y2TS Anah	102
OL-44	GAGE, PRESS., 15 psig. 6½" Dial, ½" O.D. Pipe Con.	MARSHALLTOWN MFG. CO.		Y2TS Anah	
OL-45	GAGE, PRESS., 10,000 psig. 5" Dial, 3/4" O.D. Pipe Con.	BLACKHAWK	Z720	Y2TS Anah	102
OL-41	GAGE HYD. PRESS 0-10,000 lb. capacity	DURAGAGE		Y2 Anah	102
OL-51	GAGE, PRESS., 5000 psig. 4¼" Dial, 3/4" O.D. Pipe Con.	U. S. GAUGE CO.	19031	Y2TS Anah	102
OL-52	GAGE, PRESS, 5000 psig. 4¼" Dial, 3/4" O.D. Pipe Con.	U. S. GAUGE CO.	19031	Y2TS Anah	102
OL-53	GAGE, PRESS, 5000 psig. 4¼" Dial, 3/4" O.D. Pipe Con.	U. S. GAUGE CO.	19031	Y2TS Anah	102
OL-54	GAGE, PRESS, 5000 psig. 4¼" Dial, 3/4" O.D. Pipe Con.	U. S. GAUGE CO.	19031	Y2TS Anah	102
ACL 82336	GAGE, PRESSURE, 5000 psig. 1¼" I.D. thread	MARTIN DECKER	WA-33A-500	Y2 Anah	102
LAOD 19135	HYD. FLOW BENCH, 20 gal. min. @ 3000 psig. 220/440 VAC, 60 cycle, 2-1" outlets, 2-1 5/8" returns	SPRAGUE	S250, S/N1037-3	Y2TS Anah	102
OL-16	JACK, HYD., 10 Ton Cap. 9" high, 2½" dia.	BLACKHAWK	R 426	Y2TS Anah	102

OL-17	JACK, HYD., 10 Ton Cap. 9" high, 2½" dia.	BLACKHAWK	R 426, S/NC598658	Y2TS Anah	102
OL-101	PRESS, 50 Ton Cap., 32" Stroke, Floor mounted, 4' long, 3' wide, 6' high	OWATONNA TOOL CO.	Series YD	Y7 Anah	102
NC-43888	PRESS, MANUAL, HYD. PRESS EXPLOSIVES, BENCH MOUNTED, 15" long, 18" wide, 38" high, 24000# Cap.	FRED S. CARVER	18800-90	Y7 Anah	102
OL-127	PUMP, HYD., MANUAL, 2500 psig., 9" long, 7" wide, 8" high, ¼" pipe con.	DYNEX INC.	HP-2506-92-00	Y7 Anah	102
OL-61	PUMP, HYD. MANUAL, 3000 psig., 2 qts. closed. 1 gal with breather. ¼" NPT Con. 9" long, 9" wide, 8" high	BLACKHAWK	P60, S/NB371759	Y2TS Anah	[illegible]
OL-11	PUMP, HYD., MANUAL, 3000 psig., 2 qts. closed. 1 gal with breather. ¼" NPT con. 9" long, 7" wide, 8" high	BLACKHAWK	P60, S/NB370838	Y2TS Anah	102
OL-12	PUMP, HYD., MANUAL, 3000 psig. 2 qts. closed. 1 gal with breather. ¼" NPT Con. 9" long, 7" wide, 8" high	BLACKHAWK	P60, S/NB371520	Y2TS Anah	102
OL-13	PUMP, HYD., MANUAL, 3000 psig. 2 qts. closed. 1 gal with breather. ¼" NPT Con. 9" long, 7" wide, 8" high	BLACKHAWK	P60, S/NB371846	Y2TS Anah	102
OL-14	PUMP, HYD., MANUAL, 3000 psig. 2 qts. closed. 1 gal with breather. ¼" NPT Con. 9" long, 7" wide, 8" high	BLACKHAWK	P60, S/NB351299	Y2TS Anah	[illegible]
OL-15	PUMP, HYD., MANUAL, 6000 psig. 3/8" Con. 20" long, 2½" dia.			Y7 Anah	102
LAOD-17943	TEST STAND, HYD., 5000 psig Air oper. pump	NORTRONICS		Y2 Anah	102

MECH./ELECT.

CONTROL NO.	NOMENCLATURE	MANUFACTURER	MODEL/TYPE	FACILITY	CODE
OL-142	AIR CONDITIONER, 230 VAC, 12A, 16500 BTU/hr. In 40' - Trailmobile trailer	RCA WHIRLPOOL	Mod.#C 2305-3 S/NAA-382385	RIVERSIDE	103
OL-68 OL-69	ANDERSEN SAMPLER, BACTERIOLOGICAL	ANDERSEN SAMPLER & CONSULTING SERVICE	0705 (2 ea.)	HOLLOMAN	103
OL-70 OL-71	ANDERSEN SAMPLER, BACTERIOLOGICAL	ANDERSEN SAMPLER & CONSULTING SERVICE	0604 (2 ea.)	HOLLOMAN	103
NC-056331	AUTOCLAVE PRESSURE CHAMBER STERILIZE Culture Media. 115VAC, 1750 Watts. 100-135°C, 0-30 psig. 10.5" I.D.x23" long.	Wm. BOEKEL & CO.		Y2 Anah	
OL-89	BALL MILL, 115VAC, 60 cycle, C-H 3 ld Exp. Proof Con., Cap. 4 oz., Grinding chemicals	FISHER SCIENTIFIC		Y7 Anah	103
OL-95	BANDSAW, FLOOR MOUNTED. 45° tilt, 4" throat, 30" blade 115/230 VAC, 60 cycle, 3 ld twist con.	SEARS	CRAFTSMAN 12	Y7 Anah	103
OL-56	BATTERY CHARGER, 6 & 12 Volt, all purpose.	MARQUETTE MFG. CO.	Mod. 307 Ser# 563444	Y2 Anah	103
OL-90 OL-91	BLASTING UNIT, Portable Manual, Multiple Shot, 10 Cap Capacity with an overload of 15 Caps.	FIDELITY ELECTRIC CO.	1604	Y7 Anah	103
	BLEEDER	OSTERIZER		HOLLOMAN	103
EC-44888	BLEEDER, TWIN CONE. Blend dry chemicals. Cap. 2 qts. 115/230 VAC, 2.8/1.4A, 60 cycle, C-H, 3 ld. exp. proof con. 2½' long, 2' wide, 2' high	PATTERSON-KELLEY CO.	LB 2611	Y7 Anah	103
OL-84	CALORIMETER, TABLE MOD. Cap. 2 gms, 110 VAC, 60 cycle, 15" long, 12" wide, 17" high	PARR	1211	Y7 Anah	103

OL-98	CENTRIFUGE, SPEC. PURPOSE.CHECKING 101 FLECHETTE, 115 VAC, 60 cycle. 28g. 2'x1½'x3' with 3½' arm			Y7 Anah	103
NC-47119	CHAMBER, ENVIRON., TEMP (300°F) Hum. (95%) 64 cu. ft. Floor mounted. 8½' long, 4½' wide, 7½' long. 440 VAC, 48A, 60 cycles.	WYLE LABS	TRN100-64	Y2 Anah	103
NC-54493	CHAMBER, TEMP., TEST, -70°C- +320°C. 17" door, Liq. CO2 Inlet	STATHAM	TC-2B		103
NAD-34	DRILL MOTOR, ½ Chuck	BLACK & DECKER	4405513		103
LAOD-10654	DRILL PRESS, ½ CHUCK.FLOOR MOD., 220 VAC, 1.8A A-B Type 7 Con.	WALKER-TURNER	S/N 51D33A	Y7 Anah	103
OL-175	DRILL PRESS, 5/32 Chuck,Bench mounted, 115 VAC, 1A, 60 cyc.	DUMORE	#8226-1337 Cat.# 16-91	Y3 Anah	103
NC-44912	DROP TESTER, BALL, 24" Drop, Primer Tester. 1' long, 1' wide, 4' high	NORTRONICS		Y7 Anah	103
OL-112 thru OL-119	GAS GUN-VACUUM TANK,HYPERVELOCITY GAS GUN, 12½'x2½'x4¼'	NORTRONICS	MECH/AIR	Y7 Anah	103
NC-056401	GENERATOR,POWER, GAS POWERED,120-240VAC, 60 cyc.	KOHLER	Engine-K662EP Plant-5RM61	Y2TS Anah	103
NC-056427	GENERATOR, POWER, 15 KW, 120-240 VAC, Single Phase.Gas Powered, Starting battery, Weather Proof Inst.Box. Trailer Mtd, equipped for night driving	KOHLER		Y7 Anah	103
	GLOVE BOX, CONT. ATMOS. Nitrogen purge. 5 gas outlets-serrated. 115 VAC, 3 ld. con. 30" long, 36" wide, 36" high	LABCONCO		Y7 Anah	103
NC-056261	LATHE, 6" Swing, 24" Bed, Table mounted. 115 VAC, 5.7A. 60 cyc., 48" long, 18" wide, 30" high	MAXIMAT STANDARD	62696	Y3 Anah	103
NC-56261-1	LATHE, JEWELER, 3 Jaw Univ. Table mounted. 115 VAC. 95 watt. 18" long, 9" wide, 5" high	AMERICAN EDELSTAAL CO.	OB200	Y7 Anah	103

OL-94	LATHE, METAL, 6½" Swing, 4' Bed. 220 VAC, 2.6A, 60 cycle, A-B type 7 Con. Table mounted, 7' long, 2½' wide, 4½' high	LeBLOND REGAL		Y7 Anah	103
NC-43876	MICRO-PULVERIZER, Dry Chemicals. 208-220 VAC, 2.8A, A-B type 7-9 Con. 2½'x2½'x3 3/4", on rollers.	METALS DISENTEGRATING	C.F. S/N 13680	Y7 Anah	103
NC-056354	MILL, PROPELLANT ROLLING - MAKING & ROLLING PROPELLANT	FARRELL BURMINGHAM CO.	47246	Y13	103
NC-43861-	MIXER, CHEMICALS, TWIN CONE, ½ pt. Cap. 115-130 VAC, 3.8/1.9A, C-H, 3 ld., exp. proof con.	ATLANTIC RESEARCH		Y7 Anah	3
NC-44904	MIXER CONTROL PANEL, For NC43860. 3 ld. twist con. 6' long, 1½' wide, 6' high	NORTRONICS		Y7 Anah	103
NC-43860	MIXER, PROPELLANT, 30# Cap. 220/440 VAC, 4.2/2.1A, 2-1" 2 prong threaded con. 5' long, 26" wide, 74" high	BRAMLEY MACHINERY CORP.		Y7 Anah	103
LAOD-18601-2	OSCILLOGRAM PROCESSOR, Develop paper film. 12" max. width. 115 VAC 60 cycle. 3 ld. twist 31" long, 17" wide, 18" high	CONSOLIDATED ELECTRODYNAMICS CORP.	23-109-P4 S/N 5097	Y2TS Anah	103
OL-103	OVEN, Vacuum, 500°F., 30" Hg. Cap., 120/240 VAC, 550 Watt, 3 ld. twist con. Work space 12" long, 8" wide, 8" high. OA dim. 15" long, 17" wide, 14" high.	NATIONAL APPLIANCE	5830	Y7 Anah	103
OL-78	POT, MELTING, Melt explosives. 115 VAC, 1600 watts, 1 ld. twist con. 12"x9"x2" work space. 16" long, 13" wide, 8" high	WAAGE ELECT. INC.	PSP7	Y7 Anah	103
OL-66	PUMP, VACUUM, 1/3 hp.	KINNEY VACUUM DIV.	KC-3 S/N 19830-5028-47	Y2 Anah	103
OL-79	PUMP, VACUUM, 1½" Port 40 CFM, 208/220/440 VAC, 4.9/5.2/2.6 4.6/2.3, Hubbell con. 1½' long, 1½' wide, 3' high	STOKES CORP.	48H-9 S/N 90400	Y7 Anah	103

OL-57	PUMP, VACUUM, 115/230 VAC, 7.8/3.9 H, 60 cyc. 1/3 hp. motor. 1" port. 15" long, 13" wide, 12" high	DYNEX INC.	HP-2506-92-00	Y2 Anah	103
NC-43889	RO-TAP, SIEVE SHAKER, 27 sieves, 6-325 mesh. 115/220 VAC, 4/2A, 60 cycle C-H, 3 ld., exp. proof con. 3/4 hp. motor	W. S. TYLER CO.	12611	Y7 Anah	103
OL-96	SANDER, Disc (9") Belt (½") Comb., 3/4 hp. motor, 115 VAC, 10A, 60 cycle, 2 ld. Twist Con. Floor mounted.28" long, 18" wide, 43" high.	SEARS	CRAFTSMAN 103 22500	Y7 Anah	103
OL-172	SAW, JIG, PORTABLE, 7" long, 2" wide, 7" high.115 VAC, 2.5A. 3 prong straight plug	BLACK & DECKER	BA S/N7635157	Y7 Anah	103
OL-173	SAW, PORTABLE, 13" long, 5" wide, 9" high. 115 VAC, 11.5A. 3 prong straight plug	BLACK & DECKER	A S/N 7335386	Y7 Anah	103
ACL 81954	SCALE, BALANCE, ELECTRIC.199.999 gm. Accuracy ±.02 gm. 115 VAC, 60 cyc. 19" long, 10" wide, 18" high	METTLER INSTRUMENT CORP.	B5	Y7 Anah	103
OL-111	SPIN RIG, 2600 rpm. 416 VAC, 18A. 1¼" O.D. thread, 3 ld. Con. 11 hp. motor. 3' long, 3¼" wide, 2" long with 3'x2 3/4" arm.	NORTRONICS		Y7 Anah	103
OL-99	SPIN UNIT, 600 CPS max. 222/440 VAC, 15 hp. motor	U. S. ELECTRIC MOTORS	S/N 1088149	Y7 Anah	103
NC-47232	SUB-SIEVE SIZER, Measure chemicals, Range 50-0.2 microns, 115 VAC, 60 cycles C-H, exp. proof con. 15½" long, 9" wide, 29½" high	FISHER SCIENTIFIC	S/NA 570	Y7 Anah	103
OL-49	TACHOGRAPH, 12-16 VDC, 24 hr @ 70 MPH. Con. 1/8" sq. dr. in ½" O.D. thread. 6" long, 3"wide, 7" high	WAGNER ELECT. CORP.	AA, S/N 194114	Y2TS Anah	103
NC-45115	TUMBLE MILL, Milling chemicals. 70 rpm 115 VAC, 4.4A, 60 cycle, C-H, 3 ld., exp proof con. 16" long, 11" wide, 11" high	U. S. STONEWARE	S/N ZZ60115	Y7 Anah	103

NC-47233	VISCOMETER, Density measurement of chemicals by resistance to revolving fork. 110 VAC, 60 cycle, 2 ld with gr. wire con. 13"x15"x7" in case	BROOKFIELD	LVF	Y7 Anah	103
OL-25	WRENCH, Impact, 100 ft/lbs. Cap. 115 VAC, 4A. 3 ld twist con. ½" drive	THOR	EW5, S/N 3210	Y2TS Anah	103

CONTROL NO.	NOMENCLATURE	MANUFACTURER	MODEL/TYPE	FACILITY	CODE
ACL 82341	BAROMETER, VERNIER ADJ. 4½"x43"	PRECISION THERMOMETER	54565	Y1 Anah	104
OL-20	CYLINDER, AIR, STATIC LOADING. 3000 psig. 11" long, 2 3/4" dia.	SPRAGUE	S/N 221	Y2TS Anah	104
	BAROMETER, ANEROID 5" Brass case, 3500'	TAYLOR	B2500		104
LAOD 13522	GAGE, DOALL COMPARITOR ± .00001-±.005. 115 VAC	METRON INSTRUMENT	MOD 20		104
LAOD 13523	GAGE, DOALL COMPARITOR ±.00005-±.020. 115 VAC	METRON INSTRUMENT	MOD 20		104
	GAGE, VACUUM, McCLEOD, .005-0.2 linear mm	MANOSTAT CORP.	MOD 1	Y1 Anah	104
	GAGE, VACUUM, McCLEOD, 0.1-20 linear mm	MANOSTAT CORP.	MOD 4	STDS LAB	104
	GAGE, VACUUM, McCLEOD, 5-5000 microns	F. J. STOKES	276AA (2 ea.)	STD. LAB	104
	GAGE, PRESSURE	WALLACE-TIERN	FA 160		104
	MANOMETER, HG.	KING ENGR.	BUSTM 3602	Y1 Anah	104
	MANOMETER, HG.	KING ENGR.	BSS100TMUZ	Y1 Anah	104
ACL 82358	MANOMETER, PRIM. 150 psig, Sec. 60 psig. Oper. range 32°F-160°F, 6" high. Air only	MERIAM	10AA25WM	Y2TS Anah	
NC 56256	MANOMETER, 80 mm Hg. Dial type	WALLACE-TIERN	FA129160	Y1 Anah	104
OL-88	PRESS, AIR, 24000 psi Cap. 7" Stroke, Bench mounted. 34" long, 24" wide, 38"high	BELLOWS-VALVAIR	S/NA 210589C	Y7 Anah	104
NC-056403	PRESS, AIR, Press explosives. 6" Ram, 80 psig. 20" long, 12" wide, 38" high	BELLOWS-VALVAIR		Y7 Anah	104
OL-105	PRESS, PNEUMATIC, 250 psi, 6" bore, 7" stroke 33" long, 25" wide, 37" high	MEAD	40 S/N3579	Y7 Anah	104

OL-137	PSYCHROMETER, $5\frac{1}{2}$" Dial	ABBEON INC.	M2A4	Y2TS Anah	104
	PSYCHROMETER, Sling. Wet bulb-dry bulb. $7\frac{1}{2}$" long, 1" dia. 30°-110°F	BACHARACH	12-2006	Y 34	104
	PSYCHROMETER, Sling. Wet bulb-dry bulb. $7\frac{1}{2}$" long, 1" dia. 30°-110°F	BACHARACH	12-2006	HOLLOMAN	104
OL-24	REGULATOR, Acet, Single gage. 3/8" port	PRESTO-LITE	411 MC	Y2TS Anah	104
OL-126	REGULATOR, Nitrogen, 400 & 4000 psig. $\frac{1}{4}$ I.D. ports	VICTOR EQUIPMENT CO.	SR 471 S/N 702377	Y7 Anah	104
OL-125	REGULATOR, Nitrogen, Max. in-3600 psig. out-3600 psig.	VICTOR EQUIPMENT CO.	CD62034D41B3 S/N R2515	Y2 Anah	104
OL-64	REGULATOR, OXYGEN, 50 & 4000 psig. $\frac{1}{4}$" I.D. Port.	VICTOR EQUIPMENT CO.	SR 401 S/N 642935	Y2 Anah	104
OL-63	REGULATOR, OXYGEN, 30 & 3000 psig.	VICTOR EQUIPMENT CO.	VXB 50 S/N 406491	Y2 Anah	104
OL-74	REGULATOR, OXYGEN, 200 & 4000 psig.	DECKER	SR730 S/N 576464	Y2 Ana	104
OL-129	REGULATOR, OXYGEN, 0-3000 psig. 0-150 atmospheres, 0-55 atmospheres.	PARR		Y7 Ana	104
OL-128	REGULATOR, OXYGEN, 2-100 psig. 100-3000 psig.	LINDE CO.	R-205 S/N 2N-23220	Y7 Ana	104
OL-97	VACUUM CLEANER, Water Filtered. Pneumatically operated. 2" Port. C-H 3 ld. exp. proof con.	J. B. GLASBY	55/2/W	Y7 Ana	104

CONTROL NO.	NOMENCLATURE	FLUID	MANUFACTURER	MODEL/TYPE	FACILITY	CODE
LAOD-12869	EXTINGUISHER, FIRE, 5 gal. Copper pump tank.		PYRENE MFG. CO.		Y7 Anah	105
LAOD-12870	EXTINGUISHER, FIRE, 5 gal. Copper pump tank.		PYRENE MFG. CO.		Y7 Anah	105
OL-60	FLOWMETER, LIQ., 100% 1" I.D. pipe con. 4" long, 3½" wide, 21" high		FISHER & PORTER	S/N 5705A2881A1	Y2TS Anah	105
OL-46	FLOWMETER, LIQ., 2.1 Gal/min. 1" I.D. pipe con. 4" long, 3½" wide, 21" high		FISCHER & PORTER	S/N 5705A2881A2	Y2TS Anah	105
OL-55	FLOWMETER, LIQ., 10.2 gal/min. 1" I.D. pipe con. 4" long, 3½" wide, 21" high		FISCHER & PORTER	S/N R5706C1012H1	Y2TS Anah	105
OL-62	FLOWMETER, LIQ., 25 gal.		FISCHER & PORTER	S/N 6104C1250B1	Y2TS Anah	105
OL-65	MANOMETER, MERCURY 0-60"		MERIAM	30EB25 Type W S/N R528312	Y2 Anah	105
OL-100	TANK, IMMERSION, 6' dia., 6' deep. Water supply for melt/cast bldg.		NORTRONICS		RIVERSIDE	105
LAOD-18790	TESTER, GAGE CALIB., Hydro Pneumatic Accumulator. Working pressure 3000 psig & 6000 psig.		GREER HYD.	10K-1		105

AIR

CONTROL NO.	NOMENCLATURE	MANUFACTURER	MODEL/TYPE	FACILITY	CODE
	ANEMOMETER	BACHARACH	Style 3035A	HOLLOMAN	106
NC-56255	CALIBRATOR, PNEUM. PORTABLE GAGE CALIBRATION. 6000 psig. Table mounted. $\frac{1}{2}$" Port. 15" long, 8" wide, 10" high	MARTIN-DECKER	H7-1003	Y1 Anah	106
OL-47	FLOWMETER, AIR, 11 SCFM. 1" I.D. Pipe Con. 4" long, $3\frac{1}{2}$" wide, 21" long.	FISCHER & PORTER	S/N 5803A2902A1	Y2TS Anah	106
OL-50	FLOWMETER, GAS, 3.4 SCFM. 1" I.D. Pipe Con. 3" long, $3\frac{1}{2}$" wide, 20" high.	FISCHER & PORTER	S/N 6104C1250R2	Y2TS Anah	

ELECTRICAL

CONTROL NO.	NOMENCLATURE	MANUFACTURER	MODEL/TYPE	FACILITY	CODE
OL-77	CONVERTER, ROTARY. DC input-28 amps, output-115 amps.	CARTER MOTOR CO.	S/N 13496	Y2 Anah	107
OL-140	HEATER, ELECTRIC. Room Heating	SEARS		40' Trailer RIVERSIDE	107
OL-102	HEATING PLATEN & CONT. BOX. 115 V, 3 ld. twist. Platen size 15"x7"x2" Table mounted.	NORTRONICS		Y7 Anah	107
OL-83	HOT PLATE, 115 VAC, 1.9 A. C-H 3 ld. exp. proof Con. 9"x9"	TEMPSO	HP 2625R	Y7 Anah	107
OL-138	HOT PLATE, ELECTRIC, 2 Plate. 115 VAC, 60 cyc.	McGRAW EDISON		40' Trailer RIVERSIDE	107
NA1-43787	KILN, 2000°F. 3 ld. twist, Inside dim. 6½"x8½"x10"	AMERICAN INDUSTRIAL & SCIENTIFIC CO.		Y7	107
OL-106	OVEN, ELECT. 115 VAC, 1000 Watt, C-H 3 ld. exp. proof con. 20" dia., 18" deep. 2 Shelves	HEVI-DUTY	HL S/N100641	Y7 Anah	107
NC-056326	OVEN, ELECT. 115 Volt, 240 Watt, 50-60 Cycle. Inside dimensions-26"x18"x18"	CHICAGO SURGICAL & ELECTRICAL CO.	IMP S/N 123A Cat.# 400	Y2 Anah	107
NC-47267	OVEN, ELECT. 115 VAC, 7.5A. 3 ld. twist con. 13"x13"x13" inside dim. 2 shelves.	A. DAIGER & CO.	500, S/N500/44	Y7 Anah	107
NC-056332	OVEN, ELECT. 115 VAC, 1200 watts, 50-60 cyc. 20"x18"x17"	LABLINE INC.	S/N 1122	HOLLOMAN	107
NC-45020	OVEN, ELECT. 100°F. max, Dual Control. 125 VAC, 20A. Inside dim. 24"x24"x30"	HOT PACK	Cat.#ER-30	Y7 Anah	107
NC-45021	OVEN, ELECT. 115 VAC, 1200 Watt, 50-60 cycle. C-H 3 ld. exp. proof con. Inside dim 18"x18"x19"	LABLINE IND.	S/N 1662	Y7 Anah	107
NC-43875	REFRIGERATOR, 4 cu. ft. Floor mounted. C-H 3 ld., exp. proof con. 2' long, 2' wide, 3' high. Chemical storage.	WESTINGHOUSE		Y7 Anah	107

OL-67	REFRIGERATOR, 14.4 cu. ft. Floor mounted. 115 VAC, 60 cyc. 3 ld. twist. 2'long, 2½' wide, 5' high.	GIBSON	4714	Y2 Ansh	107

PHOTOGRAPHIC

CONTROL NO.	NOMENCLATURE	MANUFACTURER	MODEL/TYPE	FACILITY	CODE
OL-145	BATTERY, 28 volt. Self charging	DBM	R12D	Y2 Anah	108
OL-146	BATTERY, 28 volt. Self charging	GORDON DYNAMAX		Y2 Anah	108
OL-168	BATTERY, 36 volt wet cell. To be used with Millikan cameras.	NORTRONICS		Y2 Anah	108
OL-169	BATTERY, NIC-CAD, 28.8 volt-dry cell. Used with Millikon cameras.	GOULD BATTERY CO.	S/N Z23480	Y2 Anah	108
OL-170	BATTERY, NIC-CAD, 28.8 volt-dry cell. Used with Millikon cameras.	GOULD BATTERY CO.	S/N Z23479	Y2 Anah	108
	CAMERA, OSCIL. IMAGES. Focal length F/1.5, 50 mm lens, 5:1 object/image. Alphax No. 3 shutter.	DUMONT	Mod. 2620 (2 ea.) Mod. 297 (3 ea.) Mod. 303 Mod. 792		108
NC-056375	CAMERA, 16 mm. w/case 400' split frame,perf for high speed. Color & B&W.	WOLLENSAK-FASTAX	WF4	Y1 Anah	108
NC-056277	CAMERA, 16 mm. w/case 100' split frame, perf for high speed. Color & B&W.	WOLLENSAK-FASTAX	WF1	Y1 Anah	108
NC-056278	CAMERA, 16 mm. w/case 100' rolls, Perf for high speed. Color & B&W.	WOLLENSAK-FASTAX	WF3	Y1 Anah	108
NC-056328 & NC-056329	CAMERA, 16 mm. w/case, powerstat & 25 mm. F/1.4 lens. 100' rolls,perf for high speed. Color & B&W.	HYCAM	K1001 (2 ea.) S/N 14482 & S/N 14527	Y1 Anah	108
NC-056402	CAMERA, 16 mm with extra shutters 100'-400' rolls,perf for high speed. Color & B&W.	MILLIKAN	DBM5	Y1 Anah	108
NC-45134	CAMERA, 16 mm with case, extra shutters & mod. w/B&H finder. 200' rolls, perf for high speed. Color & B&W.	MILLIKAN	DBM4	Y1 Anah	108

NC-56218	CAMERA, OSCIL. IMAGES.1:1-1.05X with 75 mm, F/1.9 flat field lens w/camera. 4x5 Graflak Accessories. 4x5 Polaroid film holders or roll film.	BEATTIE-COLEMAN	M2		108
NC-56217	CAMERA, OSCIL. IMAGES.1:1-1.05X with 75 mm, F/1.9 flat field lens w/camera.4x5 Graflak Accessories. 4x5 Polaroid film holders or roll film.	BEATTIE-COLEMAN	M2		108
ACL-83412-	CAMERA, OSCIL. IMAGES.1:1-1.05X with 75 mm, F/1.9 flat field lens w/camera. 4x5 Graflak Acessories. 4x5 Polaroid film holders or roll film.	BEATTIE-COLEMAN	MK2		
UAF-90917	CAMERA, OSCIL. IMAGES.400,1000,2000 film-Polaroid	BEATTIE-COLEMAN	K5LLPMII		108
NAI-24628	CAMERA, OSCIL. IMAGES.41,42,43 or 44 Polaroid film.	AREMAC	1185		108
OL-134	CAMERA, POLAROID.w/wink light & case Print size $3\frac{1}{4}$"x$4\frac{1}{4}$"	POLAROID	800	Y7 Anah	108
OL-166	CAMERA, ROLLIFLEX. $2\frac{1}{4}$"sq. Film #120, Koda-Color, Etax Color, Tri X, Plus X	F&H	T S/N 2111222	Y1 Anah	108
OL-167	CAMERA, STILL, 35 mm. Uses all types of film, 36 ex.	NIKON	F S/N 6482283	Y1 Anah	1
NA1-36516	CAMERA, STILL. 4"x5". Super Technicka All color & B&W.	LUNHOF	S/N 61547	Y1 LA	108
NC-056429	CAMERA, 16 mm Professional reflex 16-AT with 25 mm, F/1.4 SOM Berthiot lens.Color & B&W. 100' roll cartridge	PATHE PRODUCTS	16-AT	Y1 Anah	108
UAF-90493	CAMERA, OSCILLOSCOPE. Oscilloscope camera for all Y/P scopes. Prints transparencies on Poloroid film. Object to image ratios: 1:0.9, 1:1 available. 3" lens (75 MM) F/1.9. Uses Poloroid land film, types, 42, 56, 46-L, 47 and 410.	HEWLETT-PACKARD	196A		109

NC-056371 NC-056430 OL-147 OL-161	GENERATOR, TIMING LIGHT 10,000, 1000 Cps. Used on Fastax & Millikan cameras.	RED LAKE	TLG-3 (4 ea.)	Y1 Anah	108
NC-056428 NC-056279 NC-056375-1 AF-41589	GOOSE CONTROL UNIT Complete with power supply cables & connectors. For Fastax cameras .115 VAC, 60 cyc.	WOLLENSAK-FASTAX	WF301 (4 ea.)	Y1 Anah	108
OL-154	LENS, 50 mm F/2 Fastax Raptar. Adaptable to Millikan cameras	WOLLENSAK-FASTAX	S/N D54999	Y1 Anah	108
OL-155	LENS, 50 mm F/2 Fastax Raptar. Adaptable to Millikan cameras	WOLLENSAK-FASTAX	S/N D69945	Y1 Anah	108
OL-156	LENS, 50 mm F/2 Fastax Raptar. Adaptable to Millikan cameras	WOLLENSAK-FASTAX	S/N D38671	Y1 Anah	108
OL-157	LENS, 5.3 mm F/1.5, 84°. Adaptable to Millikan cameras	WOLLENSAK-FASTAX	S/N D77907	Y1 Anah	108
OL-158	LENS, 28-75 mm F/2.3 Vari-Focus Zoom Fastax Raptar. Adaptable to Millikan cameras	WOLLENSAK-FASTAX	S/N D71495	Y1 Anah	108
OL-159	LENS, 25 mm F/1.4, 1" Adaptable to Millikan cameras	WOLLENSAK-FASTAX	S/N D75057	Y1 Anah	108
OL-151	LENS, 152 mm F/2.7, 6". Adaptable to Millikan cameras	WOLLENSAK-FASTAX	S/N E12590	Y1 Anah	108
OL-152	LENS, 13 mm F/1.8, Fastax Raptar. Adaptable to Millikan cameras	WOLLENSAK-FASTAX	S/N E18645	Y1 Anah	108
OL-153	LENS, 5.3 mm F/1.5, 84°. Adaptable to Millikan cameras	WOLLENSAK-FASTAX	S/N C94054	Y1 Anah	108
ACL-81899	PHOTOMETER, 0-600 ft. candles, 6" long, 6" wide, 4" high	WESTON	756-5438	Y1 Anah	108

LAOD-10765	PHOTOMETER, 650 mm to UV Range. X1-X1000. 105-125 VAC. 3 ld. twist. 12" long, 14" wide, 9" high	PHOTO VOLT CORP.	501M	Y1 Anah	108
OL-165	POWERSTAT, 0-280 volts	SUPERIOR	Type 216 (2 ea.)	Y2 Anah	108
NC-47125	PROCESSOR, 16 mm film. B&W high speed	FAIRCHILD	MINI-RAPID	Y1 Anah	108
NC-58812 OL-171	PROJECTOR, 16 mm Analytical. 105/125 VAC-DC, 1200 watts	L & W	224A, S/N 10066 (2 ea.) & S/N 44778	Y1 Anah	108
NC-056330	PROJECTOR, 16 mm. 105/130 VAC-DC 1000 watts	KALART-VICTOR	70-0	Y1 Anah	108
OL-133	SCREEN, Projector. 60"x60"	DA-LITE		Y1 Anah	108
	SPECTROPHOTOMETER, Spectral range 320 to 1000 millimicrons	BECKMAN	B		108
OL-148 OL-149 OL-150 NC-056431	TRIPOD, w/head. For Fastax cameras	QUICKSET INDUSTRIAL	HERCULES (4 ea.) Cat #5302	Y1 Anah	108

ELECTRONIC

CONTROL NO.	NOMENCLATURE	MANUFACTURER	MODEL/TYPE	FACILITY	COD
	ACCELEROMETER, 1000g sine, 2000g shock, Freq. resp. 5-6000 CPS	ENDEVCO CORP.	2215C		109
	ACCELEROMETER, 1000g sine, 2000g shock, Freq. resp. 5-6000 CPS	ENDEVCO CORP.	2217		109
	ACCELEROMETER, Cap.-20 to 4000 CPS-temp. range to 350°F. Light wt., Ring shaped-central mounting hole with clearance for A 6-32 mounting screw(or use cement) Cable: Noise treated approx. 28 pico farads per foot, Max. Dia. .090 inches. Temp range-55°F to +165°F. Uses straight connector-Endevco EP11	ENDEVCO CORP.	2221C		109
	ACCELEROMETER (See Metrology Records)	ENDEVCO CORP.	2224		109
	ACCELEROMETER (See Metrology Records)	ENDEVCO CORP.	2226 (2 ea.)		109
	ACCELEROMETER, 9 VDC-Input 1&4-Output 2&3 AC or DC Natural freq. 400 CPS	STATHAM	A5A-2G		109
	ACCELEROMETER, 10 VDC-Input 1&4-Output 2&3 AC or DC Natural freq. 400 CPS	STATHAM	A5A-20G		109
	ACCELEROMETER, 10 VDC-Input A&C-Output B&D Natural freq. 740 CPS	STATHAM	A5A-60G		109
	ACCELEROMETER, 5 VDC-Input A&B-Output C&D+	STATHAM	A6-50-350		109
	ACCELEROMETER, 5 VDC-Input A&B-Output C-D+	STATHAM	FALO-350		109
	ACCELEROMETER, 5 VDC-Input A&B-Output C-D+	STATHAM	FA6-15-350		109
ACL-80836 ACL-80837 ACL-80838	ACCELEROMETER, approx. 1000 gs. Useful range 3 CPS to 10,000 CPS. Acceleration range .50 to 4000g. Resonance freq. -36KC	GULTON IND.	A315T		109

	ACCELEROMETER (See Metrology Records)	ENDEVCO CORP.	2211C	109
	ACCELEROMETER (See Metrology Records)	ENDEVCO CORP.	2212	109
	ACCELEROMETER (See Metrology Records)	ENDEVCO CORP.	2213	109
	ACCELEROMETER (See Metrology Records)	ENDEVCO CORP.	2213C	109
ACL-83374 ACL-80286 ACL-80666 ACL-80667	AMPLIFIER DC; Gain (variable) Range 0-1000. Rise time-<10MS, Input imped.-100,000Ω. Output imped-less than 1.Ω in series with 25 MH. Linearity-.1% to 2 KC. Frequency resp. 3db (±3% to 10KC). Power-110 VAC. A high gain, wide band amplifier designed for small voltage with transients up to several thousand CPS.	KINTEL	111EF (5 ea.)	109
NC-50256	ANALYZER NOISE, Range 20 cycle to 10,000 cycles in 8 bands. Input level-between 1 & 10 volts. Input impedance-20,000. Source: Sound level meter. Used to separate complex sounds and noises into bands of energy an octave wide in frequency. A general purpose analyzer, a filter unit, and a selective disector.	GEN. RADIO	1550A	109
ACL-81089	ANALYZER NOISE, designed to measure peak value, max. instantaneous level and time duration of impact sound or vibration. Range-5 to 20KC. Input level-1 to 10 volts. Input imped.-between 25,000 & 100,000Ω. Peak reading-rise time <50 MS within 1db of Peak. Batteries-one 1½ volt. Size D Flashlight (Rayovac 2 LP or equivalent) and one 45 volt B battery (Burgess XX30 or equivalent.)	GEN. RADIO	1556A	109
NC-50255	ANALYZER, SOUND VIBRATRO, Used to analyze frequency of electrical signals over the range-2.5-25,000 CPS in 4 ranges. Input voltage-100MV-30V. Input imped. 100,000Ω-unbalanced. Output-approx 1V for full scale meter reading.	GEN. RADIO	1554A	109

ACL-80242	BALANCE BOX, 10 channels	NORTRONICS			109
ACL-80864	BALANCE BOX, 6 channels-box mounted. Range 0-50 volts. Model 600 galvonometer, 30-0-30 DC, 125 OHMS.	NORTRONICS	SGB-1	Y2-Anah	109
ACL-80229	BALANCE BOX, 6 channels-box mounted. Range 0-50 volts. Model 600 galvonometer, 30-0-30 DC, 125 OHMS.	NORTRONICS	SGB-1	Y7-Anah	109
ACL-80230	BALANCE BOX, 6 channels-box mounted. Range 0-50 volts. Model 699 galvonometer, 30-0-30 DC, 125 OHMS.	NORTRONICS	SGB-1	Y7 Anah	109
ACL-83511	BRIDGE,MEGOHM, measures resistance from 10^3 to 10^{15} OHMS.	GEN. RADIO	1644A	Y2 Anah	109
	BRIDGE MEGOHM, a direct current wheatstone bridge measuring high resistance range .1 megohm-1,000,000 megohms with errors varying from 3% upward.	GEN. RADIO	544BA (3 ea.) 544BB (3 ea.)		109
ACL-83107	BRIDGE RESISTANCE, resistance .001 OHM to 10 MEG.	LEEDS & NORTHRUP	5305	Y7 Anah	109
ACL-81647	BRIDGE,SOLU, used for measuring electronic or solution conductivity. Uses an electron ray eye tube as a balance indicator which operates directly from the power line.	IND. INSTR.	RD-32		109
LACD-16130	BRIDGE,SOLU., Used for measuring electronic or solution conductivity. Uses an electron ray eye tube as a balance indicator which operates directly from the power line.	IND. INSTR.	RD-3		109
NC-50259	CALIBRATOR, SOUND LEVEL, A convenient device for checking the calibration of sound-level meters. Input-2 volts, 400 cycles, Total harmonics not to exceed 5%. Terminals-type 938-W binding posts. Size-4½x2" Dia., Wt.-14 oz. (.4 KG)	GEN. RADIO	1552B		109

ACL-81369	CHARGER,MAGNET. Has a 3000 volt power storage capacitance. Power source-115 volts, 10 AMP (max). Largest bar magnet that can be charged. 200mf capacitor bank-9 lbs., 34 cu. ins., 800mf capacitor bank-36 lbs., 36 cu. ins.	RFL	942		10
UAF-28120	CHARGER,MAGNET. Capable of magnetizing to saturation practically all types of permanent magnets in common use. Power cord has fuzed plug that fits any standard 110/120V condenser storage bank has a capacity of 100 microfarads to 600 V on high range. Has a capacity of 100 microfarads to 400 volts on low range.	RFL	107		10
NC-50533	COMPARATOR, Precision gaging. Range .000001-.0004. 115VAC, 3 1A twist con.	CLEVELAND	MA1720	Y1 Anah	10
NC-43859	CONTROL UNIT, Stand, Burning, Timing device for propellants. 1 millisecond to 30 sec. Floor mounted. 6"x6"x6". 125/220VAC, 60 cycles. C-H 3 1A evp. proof con.	ATLANTIC RESEARCH	SRB232	Y7 Anah	10
	COUNTER. High speed electronic counter with a precision time base in multi-purpose circuitry. Count capacity-7 digits. Count rate-10 CPS to 10 MC. Time interval-0.3 microsec. to 10^7 sec. Time base-0.1 microsec. to 10 sec. Period 0 CPS to 3 MC.	BEC-BERK	7370 (3 ea.)		10
	COUNTER, A high speed electronic counter with a precision time base in multi-purpose circuitry. Count cap-6 digit. Count rate-1MC. Time interval-1 microsec. to 10^7 sec. Time base-1 microsec. to 10 sec. Period-0 CPS to 1 MC.	BEC-BERK	7360 (3 ea.)		10
	COUNTER. 7 digits. Counts negative impulses. Produces one output for every ten input pulses.	HEWLETT-PACKARD	524 (13 ea.)		10

	COUNTER. 6 digit resolution. Max counting rate-1.2 MC. Time base-crystal oscillation aging rate-±2/10 /month. Range-2 CPS to 1.2 MC. Reads in milliseconds or microseconds with positioned decimal accuracy-±one count, ±time base accuracy, ±trigger error descr.-a solid state counter, which provides measurements versatility to 300K, 1.2 MC.	HEWLETT-PACKARD	523A (3 ea.)		109
USN-92991-213	COUNTER, ELECTRONIC. 5 digit. Counts negative pulse. Produce one output for every ten input pulses.	HEWLETT-PACKARD	522B	Y7 Anah	109
ACL-83055	COUNTER. Solid state. Measures frequency, period, multiple period average, ratios and multiples of ratios. Counting rates are DC to 20 MC. Range- 0-20 MC. Accuracy-±time base accuracy. Reads in KC or MC with positioned decimal point. 7 digits.	HEWLETT-PACKARD	5243L		109
USN-94130-233	COUNTER. A compact solid state counter, which provides measurement versatility to 300 KC 1.2 MC. Max counting rate-300 KC. Accuracy - ± one count, ± time base accuracy, ± trigger error. Registration - 5 digits columnar. Time base - crystal oscillation aging rate - ± $2x10^6$/week. Range - 2 CPS to 300 KC. Read in milliseconds or microseconds with positioned decimal.	HEWLETT-PACKARD	521A		109
AF-271456	COUNTER. Automatically counts and displays numbers. Count capacity - 5 digit. Count rate - 0 CPS to 100 KC.	BEC-BERK	7150BR		109
UAF-51963	COUNTER. A high speed electronic counter with a crystal controlled timing gate. Counts automatically in decimal form from 20 to 100,000 events which have occurred during a one-second counting interval whether they are optical, physical or electrical. Accuracy is ± 1 event for any input frequency. Freq. range: 20-100,0000 cycles per second Counting period: 1 second ± .001%. Power: 105-130 volts, 175 watts.	BEC-BERK	554		109

ACL-82937	COUNTER, ELECTRONIC. 6 digit. Precision frequency-and-time-measuring instr. Measures freq. from .0001 cycle to over 1.1 megacycles per second and time intervals from 3 microseconds to 27.8 hours. Freq. measurement range: 10 CPS to 1.1 MC. Period Measurement range: 100 microseconds to 100,000 secs. Resolution-doublepulse-0.5 microseconds; triple pulse-0.5 microseconds. Ratio measurement range - 1:1 to 999,999:1	HEWLETT-PACKARD	523B	Y7 Anah	109
	COUNTER. 5 Digits. Counts negative impulses. Produce one output for every ten input pulses.	HEWLETT-PACKARD	522B		109
	DECADE BOX. Provides any ohmage value in 1 OHM increments from 1 to 999,999 OHMS. Determines known or unknown resistance values by dialing. Available in bench or rack mounting versions. Power ratings to 225 watts max. at 1000 volts max. 6 decades for setting and detecting readout used in actual circuits and under "live" conditions. 2 sets of terminals taking banana-plug, spade-lug or plain wire connectors.	CLAROSTAT	240C (26 ea.)		109
UAF-93466	DETECTOR, AMP-NULL. A sensitive, low-noise amplifier continuously tumbling from 20 CPS to 20KC with additional fixed-tuned frequencies of 50KC & 100KC. Intended as a bridge detector. Imped. input - approx. .50 kilohms at max gain. Max safe input voltage - 200 volts AC or 400 volts DC. Gain - 120 db on the tunable ranges. 100 db. Flat range, 106 db. at 50 KC, 100 db at 100 KC positions. Output - 1 volt into 10,000 OHMS. Meter linearity accurate to ± 5% for output of less than 0.3 volts.	GEN. RADIO	1232A		109
ACL-83134	DETECTOR, NULL. To detect null between 2 signals. Range 1-10-3.	L & N	9834		109

ACL-80706	DETECTOR, GROUND. A combination electrical fault ground detector and locator. Relay contact rating: 3 AMP - 300 volt. Power consumption: 50 watts. Available ratings: 115/230/460 volts. Three or single phase, 60 or 25 cycle, 250-500 volts, DC.	EXCEL ELECTR.	SGP	109
VN-702C	DETECTOR, LEAK. For detecting halogen vapors and is used for locating small leaks in pressure systems. A self-contained control unit and a hand held detector unit with a 10 ft. cable connecting it to the control unit. A 25 ft. power cable connects the control unit to the 115 volt, 60 cycle power supply.	GEN. ELEC.	H-6	109
USN-94130-247	DETECTOR, LEAK. For detecting halogen vapors and is used for locating small leaks in pressure systems. A self-contained control unit and a hand held detector unit with a 10 ft. cable connecting it to the control unit. A 25 ft. power cable connects the control unit to the 115 volt, 60 cycle power supply.	GEN. ELECT.	91595066-1	109
UAF-75689	DETECTOR, NULL. A stabilized D-C indicating amplifier when used as a null detector - provides a short period of 2-3 seconds depending on source resistance. Sensitivity of the voltage amplifier is 0.25 Sensitivity of the current amplifier is 5x10 -12 amps. Operates on 120 V - 60 cycles.	L--N	9835B	109
UAF-93581	DEW POINTER. Electronic precipitator. 115 VAC, 50/60 cyc.	ILL TEST LAB.	7300	109

ACL-81744	DOSIMETER. Type-direct reading. Radiation measured - Gamma & X-Ray. Range - 0-0.2 roentgens. Accuracy - ±15% of true dosage from 0.09 Meu. to 2.0 Meu. (±10% for radium or CO^{67} Gamma radiation.) Dimension: 4" long x ½" Diam. Weight: ½ oz.	VICTOREEN	541A (3 ea.)	Y2 Anah	10
ACL-82842	DOSIMETER, CHARGER. Maximum charging voltage- 5 VDC-CW. Minimum charging voltage - 150 VDC-CCW. Minimum battery voltage - 1.50.	VICTOREEN	2000A		10
	DOSIMETER, POCKET. Radiation detecter-gamma. Range - 0-0.2 roentgens. Energy dependance- less than 15% of true dose at energies as low as 30 KEV. Calibration-X-ray and radium. Dose rate independance - 1 MR/HR to 100 R/HR. Dimensions - 5½" long x ½" dia.	VICTOREEN	362 (6 ea.)		10
ACL-83865	DYNAGAGE CALIB. Used as a means to furnish a stepped calibration reference for checking the gain of the dynagage and associated amplifier and recorders. Does not calibrate the transducer and transducer cables used with the dynagage.	PHOTOCON RES.	2442	Y7 Anah	10
ACL-82861	DYNAGAGE SYSTEM. 3 Channel. Superseded by new improved version - DG605D- which incorporates an AC-DC operational switch which can be used to give two modes of operation. "DC" mode - static and cynamic response from 0 to 15,000 cycles per sec. "AC" mode - dynamic response only from 0.5 to 15,000 CPS.	PHOTOCON	DG-605	Y7 Anah	10
NC-52452	DYNAMONITOR. For monitoring & amplifing vibration, shock, pressure & force signals. A 3-channel system.	ENDEVCO CORP.	2702C		10

ACL-82373	EXPLOSIMETER, Combustible gas detector.	MINE SAFETY APPLIANCE	2	Y12 Anah	109
NAI-37007	EXTENSOMETER. Designed to measure the mean value of strain in the test section of standard tension test specimens. Standard instruments include:	RIEHLE	DAR-10		109

GUAGE LENGTH	MAGNETIC RATIO PROVIDED	.001/IN 1" CHART
2.0"x.040	250-500-1000	Medium range
1.0"x.040	250-500-1000	High range
1.4"x.056	178.5-357-714	High range

OL-80	FIRING BOX, Safety firing blasting caps. 115 VAC, 60 cyc. 21" long, 13" wide, 14" high.	NORTRONICS		Y7 Anah	109
UAF-94532	GAGE, DISCHARGE. A discharge type guage. Measures the ion current caused by the cathode of the sensing tube. Tube: Length - 5 1/16" overall. Envelope O.D. - 2" stainless. Tabulation - 1"OD x 1½" long stainless. Power Supply - 115 volts, 60 cycle, A.C. Scale Range: 25x10-3 to 1x10-4 MM HG 1x10-9 to 1x10-5 MM HG 1x10-5 to 1x10-7 MM HG	CON VACUUM	GPH-100A		109
ACL-82440	GAGE, TC VACUUM. Range $1x10^{-3}$ to 10 ~~11,000~~ microns. 115 VAC, 60 cyc. 10" long, 5" wide, 6" high	CENSCIENTIFIC	94178	Y1 Anah	109
AF-306539-C1A	GAGE, VACUUM. Magnetic vacuum gauge. Thermal Conductivity covers $1x10^{-3}$ torr to atmosphere pressure range. Low drift. 1-4 stations. Recorder taps. Guage temp. range 58°F to 95°F. Guage power input - 20 watt. Guage line voltage-115 volt, 60 cycle. 2 meter scales - 1 to 100 microns HG & 0.1 to 500 MM HG.	CON VACUUM	GMA-140		109
NC-43490	GAGE, VACUUM. (See Metrology Records)	CEC	DPA-38		109

OL-81	GAGE, VACUUM. Ionization. 110 VAC, 8" long, 3½" wide, 5" high.	NRC EQUIPMENT CORP.	721, 8/N07210236	Y7 Anah	109
	GAGING SYSTEM. Differential, Magnification 200-200,000, 115VAC, 60 cycle, 3 ld. twist con.	CLEVELAND	A215R-OH (3 ea.)	Y1 Anah	109
ACL-80782	GALVANOMETER. An external galvo.	HEILAND DIVISION	DUMMY (4 ea.) Elect. Magn.	Y7 Anah	109
ACL-83236	GALVANOMETER. Freq. 100 CPS, Freq. resp. 0-60 CPS, External Res. 120 OHMS. Max. safe current 15 MA. Max. peak to peak deflection with ± 2% linearity - 8 inches.	HEILAND DIVISION	M100-120 (4 ea.) Elect. Magn.	Y7 Anah	109
ACL-83240 ACL 83241	GALVANOMETER. Freq. 100 CPS, Freq. Resp. 0-60 CPS, External Res. 350 OHMS. Max. safe current - 10 MA. Max. peak to peak deflection with ± 2% linearity - 8 inches.	HEILAND DIVISION	M100-350 (2 ea.)	Y7 Anah	109
ACL-80770 ACL-80771 ACL-80773 ACL-80775 ACL-80709 ACL-80710 ACL-80711 ACL-80712 ACL-80713 ACL-80714 ACL-80715 ACL-80716 ACL-80769	GALVANOMETER. Freq. 200 CPS, Freq. Resp. 0-120 CPS, External Res. 120 OHMS. Max. safe current - 15 MA. Max. peak to peak deflection with ± 2% linearity - 8 inches.	HEILAND DIVISION	M200-120 (15 ea.) Elect. Magn.	Y7 Anah	109
ACL-80719	GALVANOMETER. Freq. 40 CPS. Freq. Resp. 0-24 CPS, External Res. 120 OHMS. Max. safe current - 15 MA. Max. peak to peak deflection with ± 2% linearity - 8 inches.	HEILAND DIVISION	M40-120 (8 ea.) Elect. Magn.	Y7 Anah	109

ACL-80718	GALVANOMETER. Freq. 40 CPS. Freq. Resp. 0-24 CPS. External Res. 350 OHMS. Max. safe current - 15 MA. Max. peak to peak - 8 inches.	HEILAND DIVISION	M40-350 (4 ea.) Elect. Magn.	Y7 Anah	10
ACL-83242 ACL-83244 ACL-83246 ACL-83247 ACL-83248 ACL-81099 ACL-81100	GALVANOMETER. Freq. 400 CPS. Freq. Resp. 0-240 CPS. External Res. 120 OHMS. Max. safe current - 10 MA. Max. peak to peak deflection with ± 2% linearity - 8 inches.	HEILAND DIVISION	M400-120 (9 ea.) Elect. Magn.	Y7 Anah	10
ACL-83225 ACL-83226 ACL-83227 ACL-83229 ACL-80781 ACL-81150 ACL-80723 ACL-80724	GALVANOMETER. Freq. 1000 CPS. Freq. Resp. 0-600 CPS, Source Res. 3-100 OHMS. Max. safe current - 100 MA. Max. peak to peak deflection with ± 2% linearity - 8 inches.	HEILAND DIVISION	M1000 (9 ea.) Fluid type.	Y7 Anah	10
ACL-83233	GALVANOMETER. Freq. 3300 CPS. Freq. Resp. 0-2000 CPS, Source Res. 3-100 OHMS. Max. safe current - 100 MA. Max. peak to peak deflection with ± 2% linearity - 6 inches.	HEILAND DIVISION	M3300 (2 ea.) Fluid type.	Y7 Anah	10
ACL-83234 ACL-81102 ACL-80725 ACL-80726 ACL-80765 ACL-80766	GALVANOMETER. Freq. 5000 CPS. Freq. Resp. 0-3000 CPS, Source Res. 3-100 OHMS. Max. safe current - 100 MA. Max. peak to peak deflection with ± 2% linearity - 3.5 inches.	HEILAND DIVISION	M5000 (8 ea.) Fluid type.	Y7 Anah	10
ACL-80319	GENERATOR, SWP TIME-DELAY. A general purpose lab device for time domain measurements for pulse operation. Power supply input 105-125 volts or 210-250 volts. 50-60 cycles, 385 watts.	GEN. RADIO	1391AM		1(

ACL-81086	IGNITOR CIRCUIT TESTER. Range 0-30 OHMS. Max. output current is 1% of minimum firing current for one squib. Accuracy 15 ±.02 OHMS at the 0-5 range, ±0.05 OHMS at the 5-30 OHM range. Max. current: .005 AMP. Battery Life: 1 year (for field replacement of battery use Mallory No. Rm 12-T2 or equivalent only.)	ALLEGANY	101BF	Y2 Anah	1
ACL-81087	IGNITOR CIRCUIT TESTER. Range 0-30 OHMS. Max. output current is 1% of minimum firing current for one squib. Accuracy is ±.02 OHM at the 0-5 range, ±0.05 OHMS at the 5-30 OHM range. Max. current: .005 AMP. Battery life: 1 year (for field replacement of battery use Mallory No. Rm 12-T2 or equivalent only.)	ALLEGANY	101-5BF	Y7 Anah	1
OL-72	INDICATOR, FLOW RATE. 2-20 gpm.	BROOKS INSTRUMENT CO.	4100 S/N6508-81046/1	Y2 Anah	1
OL-73	INDICATOR, FLOW RATE. 28-280 gpm.	BROOKS INSTRUMENT CO.	4100 S/N 6508-81046/2	Y2 Anah	1
EC-47124	INDICATOR, ROTARY. Scale range-high - ±.0002 Med. scale = ±.001 Low scale = ±.005	CLEVELAND	A215R	Y1 Anah	1
OL-123	LUMILINE SCREEN. Velocity measurement. 1" O.D., 5 prong thread con., 42"x36"x3". Mates OL-121.		601A, S/N 606	Y7 Anah	1
OL-121	LUMILINE SCREEN. Velocity measurement. 1" O.D., 5 prong thread con., 42"x36"x3". Mates OL-123.		601A, S/N 607	Y7 Anah	1

ACL-81090	METER, SOUND LEVEL. Can be used as a highly sensitive A.C. volt meter. Sound level range 24-150 db above 0.0002 micro bar. Meter range - 16 db. Attentuator range is 110 db in 10 db steps. Accuracy - ± 1 db for average machinging noise. Batteries - two 1½ volt flashlight (D) cells (Eveready 950 or equiv.) and one Eveready 467-B (or equiv.)	GEN. RADIO	1151B		10
ACL-83601	METER, SOUND SURVEY. Range 40-136 db. Accuracy - ± 1 db. Max. safe operating temp. is 115°F. Batteries - one 1½ volt size C.(flashlight type)and one 30 volt hearing aid battery.	GEN. RADIO	1555A		10
NA1-36034 ACL-80574	METER-VTVM. Range 1-300 volts in 6 ranges. 1, 3, 10, 30, 100 & 300 volts AC or DC and 0-1000 volt range D.C. Accuracy - ± 3% of full scale on all A.C. voltage. Power supply - 115/230 volts.	HEWLETT-PACKARD	410B (15 ea.)	Y2 Anah	10
	METER, VACUUM TUBE VOLT. Volt range 0.1 millivolt to 300 volts 12 range selected. Decibel range -72 to +52db in 12 ranges. Freq. range 10 CPS to 4 M C/S. Power supply 115/230 volts.	HEWLETT-PACKARD	400 (84 ea.)		10
ACL-83067	METER, VIBRATION. Measures vibration in units of velocity, displacement and acceleration. Equiped with 2 input cannon connectors on the meter for input selectors. Power source 111 volts, 50/60/400 cycles.	MB ELECTRONIC	M3		10

FUNCTION SELECTION POSITION	DECADE RANGE FULL SCALE	MINIMUM ON-SCALE READING
DISPLACEMENT (INCHES-TOTAL)	1,.1,.01,.001	.1,.01,.001,.0001
VELOCITY (IN/SEC VECTOR)	1000,100,10,1,.1,.01	100,10,1,.1,.01,.001
ACCELERATION (6 VECTOR)	1000,100,10,1	100,10,1,.1

ACL-80942 ACL-80096 ACL-80233	METER, VOLT-OHM. Sensitivity - 50 micro amps full scale. Accuracy - 3% DC & 5% AC of full scale deflection. DC Range - 0-5000 volt - 20,000 OHM per volt sensitivity AC Range - 0-5000 volt - 1,000 OHM per volt sensitivity.	SIMPSON	260 (186 ea.)	Y7 Ana	10
PRE-11112-289	METER, VOLT-OHM. Measures directly the peak to peak values of complex wave forms and the RMS values of sine values on separate scales. Frequency compensated for AC voltage ranges up to and including the 500 volt range. Overall accuracy is ± 5% of full scale on AC voltage. ± 3% of full scale on DC voltage.	RCA	WV97A		10
PRE-11111-675	METER, VOLT-OHM. No longer in service.	PRECAPPARATUS	120		10
ORD-404-623-54	METER, VOLT-OHM. Self-contained ranges. DC 0-3-12-60-300-1200-6000 at 20,000 OHMS per volt. AC 0-3-12-60-300-1200-6000 at 5,000 OHMS per volt.	TRIPLETT	630A	X2 Anah	10
ACL-82968	METER, VOLT-OHM. Sensitivity - 50 Micro Amperes full scale. Accuracy - DC range: 250 MV thru 1000V ±1½% of full scale. 5000V ±2½% of full scale. AC Range: 2.5 volts thru 1000V ±2% of full scale. 5000V ±3% of full scale. DC Range - 250 MV thru 1000 V. AC Range - 2.5 V thru 5000 V.	SIMPSON	270	Y7 Anah	10

ACL-80696	MICROMETER, VERNIER For measurement of high standing wave ratios by the width of minimum method. Maximum range is 2 CMS.	GEN. RADIO	874-LV	109
NC-50257	MICROPHONE SYSTEM Battery operated power supply. Frequency response: 20 cycles to 15 KC. Batteries: One 1½ volt size D flashlight cell (Eveready 950 or equivalent) and one 300 volt B battery Eveready 493 or Burgess V-200 are supplied.	GEN. RADIO	1551-PIL	109 109
NC-50258	MICROPHONE SYSTEM Designed for use with sound level meter. Dynamic microphone sys. - 25 ft. cable. A transform to increase the output voltage. Sensitivity - 90 db below one volt per microbar (open-circuit output of typical mic.) Microphone plus transformer is 60 db below one volt per microbar. Max. safe sound pressure level 140 db and below.	GEN. RADIO	1560-P12	109
LAOD-18601	OSCILLOGRAPH. Req. range 0-300 cycles per second. Records AC signals or DC deviation. Speed range - 3/4 to 24 in. per sec. Power - 115 VAC. 6 channel - active, 1 channel - static reference trace. Record magazine - 100 ft. capacity. Temp. range - 32° to 110°F.	CON ELECTRO DYN.		109
NAI-36917	OSCILLOGRAPH. Active channels - 36 max. Record width - 8" max. Recording speed - 435 max. Recording speed - 200 min. Stand-by speed - 95 Power supply - 105-125 volts AC or 23.5-28.5 volts DC.	HEILAND DIVISION	708C	109

UAF-93484-C2	OSCILLOSCOPE. Provides visual display of high speed repetitive signals and measures transistor rise time & diode switching speed. For testing fast computor circuits. Cathode ray tube - 5 inch type 5 AQP. Useful deflection - 10 CM x 10 CM. Power - 115/230 volts.	HEWLETT-PACKARD	185B12	109
AF-306629	OSCILLOSCOPE. Provides visual display of high speed repetitive signals and measures transistor rise time & diode dwitching speed. For testing fast computor circuits. Cathode ray tube - 5 inch type 5 AQP. Useful deflection - 10 CM x 10 CM. Power - 115/230 volts.	HEWLETT-PACKARD	185A	109
	OSCILLOSCOPE. (See Metrology Records)	TEKTRONIX	532 (2 ea.)	109
	OSCILLOSCOPE. (See Metrology Records) DC-15 MHZ - Sweep delay.	TEKTRONIX	535 (8 ea.)	109
	OSCILLOSCOPE. (See Metrology Records) DC-10 MHZ - X-Y.	TEKTRONIX	536 (3 ea.)	109
	OSCILLOSCOPE. (See Metrology Records)	TEKTRONIX	541 (5 ea.)	109
	OSCILLOSCOPE. Calibrated sweep delay. DC-33 MHZ.	TEKTRONIX	545 (67 ea.)	109
	OSCILLOSCOPE. DC-27 MHZ - Dual vertical, dual beam.	TEKTRONIX	551 (4 ea.)	109
	OSCILLOSCOPE. DC-33 MHZ - Sweep delay, dual beam.	TEKTRONIX	555 (13 ea.)	109
	OSCILLOSCOPE. Split screen storage.	TEKTRONIX	564 (1 ea.)	109
	OSCILLOSCOPE. Digital readout oscilloscope.	TEKTRONIX	567 (1 ea.)	109

OSCILLOSCOPE. DC-85 MHZ - Sweep delay.	TEKTRONIX	585 (5 ea.)	109
OSCILLOSCOPE. Sampling.	TEKTRONIX	661 (2 ea.)	109
OSCILLOSCOPE. DC to 30 KC high sensitivity - general purpose. 21 calibrated ranges sweep from 1 micro sec/cm to 5 sec/cm to 5 sec/cm. Accurate within 5%. Cathode-ray tube-5 AQP Mono-accelerator flat face. 3000 volt acceleration potential.	HEWLETT-PACKARD	130 (15 ea.)	109
OSCILLOSCOPE. DC to 300 KC oscilloscope. General purpose cathode-ray tube-5 AQP mono-accelerator. Precision type. 2500V acceleration potential. Used with either internal or external sweeps. Power 115/230 volts.	HEWLETT -PACKARD	120A (3 ea.)	109
OSCILLOSCOPE. A calibrated general purpose test instrument. A vertical band width of 50 megacycles and a 6x10 CM display. Cathode-ray tube-post accelerator. 12 KU accelerating potential. Power 115/230 VAC.	HEWLETT-PACKARD	175A (6 ea.)	109
OSCILLOSCOPE. (See Metrology Records) DC -4 MHZ.	TEKTRONIX	310 (2 ea.)	109
OSCILLOSCOPE. (See Metrology Records)	TEKTRONIX	315 (3 ea.)	109
OSCILLOSCOPE. (See Metrology Records)	TEKTRONIX	316 (1 ea.)	109
OSCILLOSCOPE. (See Metrology Records) DC-6 MHZ. AC/DC or battery.	TEKTRONIX	321 (1 ea.)	109
OSCILLOSCOPE. (See Metrology Records)	TEKTRONIX	451 (1 ea.)	109
OSCILLOSCOPE. 100 micro V/CM dual beam.	TEKTRONIX	502 (2 ea.)	109
OSCILLOSCOPE. (See Metrology Records) DC-15 MHZ.	TEKTRONIX	515 (4 ea.)	109
OSCILLOSCOPE. (See Metrology Records)	TEKTRONIX	517 (2 ea.)	109

	OSCILLOSCOPE. (See Metrology Records) DC-1 GHZ	TEKTRONIX	519 (1 ea.)		109
USN 94130-224 AF-270493	OSCILLOSCOPE. DC to 10 MC oscilloscope. General purpose. Cathode-ray tube - 5 AMP Mono-accelerator with unitized, plug-in construction. 5000 volt acceleration potential. (Internal or external) For use with a variety of vertical amplifier plug-in units to perform many different functions. Power 115/230 volts AC.	HEWLETT-PACKARD	150A (2 ea.)		109
UAF-61772	OSCILLOSCOPE. A general purpose cathode-ray oscillograph. Range 0-1000 volt. Signals from DC to over 50,000 CPS. Can be used directly with most transducers. Any amplitude portion of the input can be measured. Uses the type 5 ADP-Cathode-ray tube.	DUMONT	304A		109
AF-306507	OSCILLOSCOPE. Dual trace to visually indicate AC signals and pulse data. Bandwidth - DC to 500 KC (3db). Sensitivity - 40 MU/CM (10 CM full scale)	ANALAB INSTR.	1120		109
ACL-82635	OSCILLOSCOPE. Dual trace. DC 33 MHZ - Sweep delay. Uniform-focus 6x10-CM display. Accepts amplifier, spectrum analyzer and special purpose plug-in units.	TEKTRONIX INC.	545A	Y7 Anah	109

	PICKUP, VIBRATION. Ball bearing. Max. available displacement 36.4 inches. Temp. range - 50°F to 250°F. Freq. range - 0.2000 CPS.	MB ELECTRONIC	124 (3 ea.)		10
	PICKUP, VIBRATION. Jewel bearing. Max. available displacement 36.4 inches. Temp. range - 50°F to 250°F. Freq. range - 0.2000 CPS.	MB ELECTRONIC	126 (1 ea.)		10
NAI 25229	POWER SUPPLY. Provides DC for any instrument adaptable from an AC source. Ampmeter range - 0-150 VADA. Voltmeter range - 0-15 VDC.	CROWN RECT.	P9-1500T22F		10
NAI 25228	POWER SUPPLY. Provides DC for any inst. adaptable from an AC source. Ampmeter range - 0-150 VADA. Voltmeter range - 0-10 VDC.	CROWN RECT.	P9-1500T22		10
AF-306926-1	POWER SUPPLY. Voltage: 0-120 volts. 2 section power supply: Lower unit-unregulated. Upper unit-short circuit proofing & regulators.	TRANSELECTRON	RF-280		10
AF 306925-1	POWER SUPPLY. Voltage: 0-120 volts. 2 section power supply: Lower unit-unregulated. Upper unit-short circuit proofing and regulators.	TRANSELECTRON	RF-280		10
AF 306926 AF 306925	POWER SUPPLY. Voltage: 0-120 volts. 2 section power supply: Lower unit-regulated.	TRANSELECTRON	RS-280 (2 ea.)		10
LACD 18278	POWER SUPPLY. DC power supply. AC volts 460 DC volt 29 AC amps 75 DC amp 1800	INET	PSPL		10
LACD 12043	POWER SUPPLY. DC power supply. AC volts 460 DC volts 24 AC amp 75 DC amp 1800 Cycles 60 5 phase	INET	FSPLR		10
USN 94130-178	POWER SUPPLY, DC 0-36 volts. 0-20 amps.	NJE CORP.	CR36-20C	Y7 Anah	10

ACL-82927	POWER SUPPLY. Regulated output voltage - 0-30 volts. DC-continuously variable. Full load output current - 150 MA over entire voltage range. Output impedance - less than 0.2 OHM in series with less than μh with meter monitoring voltage. Meter range-full scale indication of 10 MA, 30 MA, 100 MA, 300 MA, 10V and 30V. Power - 115/230 volts ±10%, 50 to 60 CPS, 16 watt.	HEWLETT-PACKARD	721A	Y7 Anah	10
ACL-81704	POWER SUPPLY. 0 - 40 volts. 0 - 20 AMP DC.	NJE CORP.	CR36-20B S/N 12117-2	Y2 Anah	10
ACL-81711	POWER SUPPLY. 0 - 40 volts. 0 - 20 AMP DC.	NJE CORP.	CR36-20B	Y2 Anah	10
ACL-81757	POWER SUPPLY. Regulation - Line (105-125 volts - 0.1% or 0.01 volt) Load (no load to full) - 0.1% or 0.01 volt. Ripple - less than 1 millivolt. Input range - 105V to 125V. Regulation speed - 0.3 millisecond. Mounting - rack & table.	ELECT. MEAS. CO.	T036-15M	Y7 Anah	10
USN-94130-321	PREAMPLIFIER. Dual trace - calibrated. Plug-in unit for oscilloscope. Accurate within 1 microsec. Display rate - 100 KC.	TEKTRONIX INC.	53/54CA	Y7 Anah	10
	PREAMPLIFIER. Oscilloscope: 530-540 dual channel.	TEKTRONIX INC.	53/54CA (8 ea.)		10
	PREAMPLIFIER. Oscilloscope: 530-540 DC coupling.	TEKTRONIX INC.	53/54D (12 ea.)		10
	PREAMPLIFIER. Oscilloscope: 530-540 AC coupling.	TEKTRONIX INC.	53/54E (4 ea.)		10
	PREAMPLIFIER. Oscilloscope: 530-540 differencial input.	TEKTRONIX INC.	53/54G (4 ea.)		10

PREAMPLIFIER. Oscilloscope: 530-540 fast rise.	TEKTRONIX INC.	53/54K (5 ea.)	10
PREAMPLIFIER. Oscilloscope: fast rise - high gain, DC.	TEKTRONIX INC.	53/54L (5 ea.)	10
PREAMPLIFIER. Oscilloscope: 530-wide band.	TEKTRONIX INC.	53A (2 ea.)	10
PREAMPLIFIER. Oscilloscope: wide band - high gain 530.	TEKTRONIX INC.	53B (3 ea.)	10
PREAMPLIFIER. (See Metrology Record)	TEKTRONIX INC.	53C (1 ea.)	10
PREAMPLIFIER. Oscilloscope used: Type 530, 590, 550.	TEKTRONIX	B (10 ea.)	10
PREAMPLIFIER. Oscilloscope used: Type591/541A, 545/545A, 555, 581, 585, 551, 531/531A, 533/533A, 535/535A, 532, 536.	TEKTRONIX	CA (89 ea.)	10
PREAMPLIFIER. Oscilloscope used: Type 530, 540.	TEKTRONIX	D (49 ea.)	10
PREAMPLIFIER. Oscilloscope used: Type 530, 540, 550.	TEKTRONIX	E (17 ea.)	10
PREAMPLIFIER. Oscilloscope used: Type 530, 540, 550, 580.	TEKTRONIX	G (9 ea.)	109
PREAMPLIFIER. Oscilloscope used: Type 541/541A, 545/545A, 555, 551, 531/531A, 533/533A, 535/535A, 532, 536, 543/543A.	TEKTRONIX	H (12 ea.)	109
PREAMPLIFIER. Oscilloscope used: Type 530, 540, 550.	TEKTRONIX	K (8 ea.)	109
PREAMPLIFIER. Oscilloscope used: Type 530, 540, 550, 580.	TEKTRONIX	L (49 ea.)	109

	PREAMPLIFIER. Oscilloscope used: Type 541/541A, 545/545A, 555, 551, 531/531A, 533/533A, 535/535A, 532, 536, 543/543A, 581, 585.	TEKTRONIX	M (8 ea.)	109
	PREAMPLIFIER. Oscilloscope used: Type 530, 540, 550, 580.	TEKTRONIX	N (15 ea.)	109
	PREAMPLIFIER. Oscilloscope used: Type 530, 540, 550, 580.	TEKTRONIX	R (3 ea.)	109
	PREAMPLIFIER. Oscilloscope used: Type 536.	TEKTRONIX	T (2 ea.)	109
	PREAMPLIFIER. Oscilloscope used: Type 530, 540, 550, 580.	TEKTRONIX	W (1 ea.)	109
	PREAMPLIFIER. Oscilloscope used: Type 530, 540, 550, 580.	TEKTRONIX	Z (26 ea.)	109
	PREAMPLIFIER. A wide band dual-channel vertical amplifier used with the 175A oscilloscope. Each channel: Sensitivity range - 0.05V/CM to 20 V/CM. Accuracy - + 3%. Input impedance - 1 megohm shunted by 28 PF.	HEWLETT-PACKARD	1750A (6 ea.)	109
AF-306889	PREAMPLIFIER. A plug-in vertical amplifier when plugged into 185A oscilloscope. Bandpass - DC to greater than 500 MC at 3 db. Point overshoot or undershoot - less than 5%. Calibrated ranges: 10 MV/CM to 200 MV/CM in a 1, 2.5 sequence. Input impedance: 100K shunted by 3 PF.	HEWLETT-PACKARD	187A	109
ACL-83083 GFPM360002-1003	PREAMPLIFIER. Auxiliary plug-in amplifier used with 175A oscilloscope. Sweep occurance: normal or single sweep. Sweep arming: internal or external pulse.	HEWLETT-PACKARD	1780A (2 ea.)	109

QFPMS60002-1002	PREAMPLIFIER. A single channel vertical amplifier used with the 175A oscilloscope. Attenuator accuracy: ± 3%. Input impedance: 1 megohm (nominal) shunted by approx. 22 PF. Sensitivity - 9 calibrated ranges in 1, 2, 5, 10 sequence from 0.05 V/CM to 20 V/CM.	HEWLETT-PACKARD	1753A		10
ACL-83082	PREAMPLIFIER. A high gain vertical amplifier - single channel used with the 175A oscilloscope. Sensitivity: 5 MV/CM to 20 Volt/CM in 12 calibrated ranges. Dual input: AC or DC. Input impedance: approx. 1 megohm with less than 35 PF shunt capacitance.	HEWLETT-PACKARD	1752A		10
VN-702C	PREAMPLIFIER. A dual trace amplifier. DC current to 10 megacycles. Rise time: 0.035 microseconds. 9 ranges (calibrated)	HEWLETT-PACKARD	153A		10
UAF-91488	PRIMARY PRESS STD. Analyzes measurements of mass, length and time to calibrate both gage and absolute secondary pressure standards and pressure measuring devices. Range - 0.3-500 PSI - 1.5, 5.0, 75, 50, 150, 500 PSI. Accuracy - 0.015% of reading in the lower range. 0.025% of reading in the 2 high ranges. Resolution - better than 0.002% of reading. Temp. range - 60°F to 100°F.	CON ELECTRODYN	6-201		10
NC-056335	PROGRAMMER, AGASTAT SOLID STATE. Used for test programming.	ELASTIC STOP NUT CORP.	S/N P140	Y2 Anah	10
NC-44782	PROGRAMMER, TEST EVENT. Used for test programming.	NORTRONICS		Y7 Anah	10

ACL-80905	PSYCHROMETER, SLING. Wet bulb - dry bulb.	BACHARACH	SAC	Y1 Anah	10
	PYROMETER. Can be used as: A direct temperature measurement using a thermocouple to calibrate potentiometer-type instruments to calibrate millivolt - meter-type instruments.	THERMO ELECTRIC	70200 (1 ea.) 70237 (2 ea.) 80200 (2 ea.) 80236 (1 ea.) 80237 (3 ea.)		10
	RADIO FIELD POWER PACK. Accepts "Messenger III" radio for portable operation. Equip. with ant. Rechargeable Ni-Cad batt. Space to connect stand-by batt. Operates from 117 VAC or 12 VDC. Vehicle (14 watts output) 13.8 VDC.	E. F. JOHNSON	Mod. 250-825		10
	RADIO POWER SUPPLY Attached to "Messenger III" 2 way radio. Operates from 105-125 VAC. 13.8 VDC (14 watt) output.	E. F. JOHNSON	Mod. 250-823		10
OL-135 OL-136	RADIO, 2 WAY (WALKIE TALKIE) Unit 34 & 35. Duo/Com 100.	OSBORNE ELECTRONIC SALES CORP.	WG S/N018068 & DF S/N050270	Y4 Anah	10
	RADIO, 2 WAY, BASE STA., 5 Watt, 10 Ch. Crystals for Channel 10. Rear jacks for ext. spkr. or pub. add. output. Connects to Mod. 250-823 AC/DC powr. supp. Fits into Mod. 250-825 Field Powr. Pack. or conn. direct to 12 VDC veh. elct. sys. Unit 31 & 32.	E. F. JOHNSON	Mod. 242-150 Messenger III S/N 066936 & S/N 66435		10
	RADIO, 2 WAY, HANDIE-TALKIE. Unit 33. 1½ watt with crystals for Channel 10. Ni-Cad rechargeable batt., one spare. Case for penlite batt.	E. F. JOHNSON	Mod. 242-102 S/N 60706		10

RADIOMETER. Temperature measurement. Remote inacessible and moving objects. Amt. to 3600°C. 6500°F. Accuracy 2%. Head & Readout meter. 117 VAC single phase, 150 watts.	BARNES ENG. CO.	Mod. R-401	10
RECORDER. Push button controlled. Uses standard CEC galvonometer. Available in 6-, 12-, or 18-trace type. Records are 7" wide.	CONELECTRODYN	5-124 (3 ea.)	10
RECORDER. Electric contact control.	BROWN DIVISION	152C15T (2 ea.) 153C10PS (1 ea.) 602C1C-23 (1 ea.) 602C1C-33 (1 ea.)	10
RECORDER. Electric proportional control.	BROWN DIVISION	153R10PS (1)	10
RECORDER. (See Metrology Record)	BROWN DIVISION	153X72P16 (3 ea.)	10
RECORDER. (See Metrology Record)	BROWN DIVISION	602X1-C11 (1 ea.)	10
RECORDER. Fully-compensated. Liquid filled.	BRISTOL	IT500FF-1A (1 ea.)	10
RECORDER. Wide-strip dynamaster, DC.	BRISTOL	1P1G560DW (1 ea.)	10
RECORDER. Single dynamaster, D.D.	BRISTOL	1P1G560D1 (2 ea.)	10
RECORDER. (See Metrology Records)	BRISTOL	12PG1X571 (1 ea.)	10
RECORDER. 2 pen thermometer recorder.	BRISTOL	2T500 FFFS4 (1 ea.)	10

UAF-90172	RECORDER. Dual channel, DC amplifier recorder-portable. Stable-high-gain carrier amplifier. Records in vertical, horizontal or at a 20° angle. Range of recording speeds - 1 millimeter per second to 100 MPS. Channel width - 5.0 centimeters wide. Power reqmts. - 103-127 volts, 60 cycle. Freq. response: DC to 125 cycles within 3 db at 10 millimeter peak to peak amplitude.	SANBORN	320		10
AF 306539-C1B	REGULATOR, PRESS. 125 psig. Inlet - 200 psig. max. Flow - 5 SCFM.	CONOFLOW CORP.	PH-10		10
USN-94130-248	RELAY, VOLTAGE. Relay cap. 5000 OHM. Potentiometer - 50,000 OHMS, 2 watt. Capacitance - 1.0 MFD.	GEN. ELECTRIC	M9714605		10
	RESISTOR, DECADE. Low zero resistance - less than 0.0003 OHM per decade. High accuracy - 0.05¢.	GEN. RADIO	1432 (52 ea.)		10
ACL-81106	STROBOLUX. Strobotac range to 100 flashes/sec. Accurate as source controlling the speed. Power Req. 105-125 or 210-250 VAC, 50-60 cycle, 125 watts.	GENERAL RADIO	648A	Y1 Anah	10
	STROBOTAC. 600-14,400 rpm. 115 VAC, 60 cycle.	GENERAL RADIO	631B (3 ea.) 631BL (8 ea.)	Y1 Anah	10
OL-82	STROBOTAC. 0-25000 rpm. 115 VAC, 60 cyc.	GENERAL RADIO	1531-A	Y7 Anah	10
NA1-36035	TACHROMETER PICKUP. 300-200,000 rpm. Frequency indication 115 VAC, 50/60 cyc., 3 ld. twist con. 6" long, 6" wide, 18" high.	HEWLETT -PACKARD	506A		10

NC-50476	TELEVISION. Closed circuit. Test observation.	KINTEL	1988DCU	Y7 Anah	10
ACL-82862	TERMINATION NET. (See Metrology Records)	PHOTOCON	2573		10
ACL-82863	TERMINATION NET. (See Metrology Records)	PHOTOCON	2573		10
ACL-82864	TERMINATION NET. (See Metrology Records)	PHOTOCON	2573		10
NC-52150	TEST SYSTEM, STRENGTH. Shear & tension tests under controlled temp. 600-8000°F. 115 VAC, 60 cyc.	TINIUS OLSEN	S-2-3-R20		10
ACL-80522	TESTER, SQUIB. For checking explosive devices. Max. output is only 1% of the minimum firing current for one squib. Max. current - .005 AMPS. Range - 0-30 OHMS. Accuracy - 0-50 OHMS ±0.02 OHMS. 5-30 OHMS ± 0.05 OHMS Battery life - 1 year.	NORTRONICS		Y7 Anah	10
	TRANSDUCER. (See Metrology Records) Lowest cost - 100-5000 psig range.	CONELECTRODYN	4-311 (5 ea.)		10
	TRANSDUCER. (See Metrology Records) A small size general purpose transducer.	CONELECTRODYN	4-312 (2 ea.)		10
	TRANSDUCER. (See Metrology Records) Flush mounted - diaphram type.	CONELECTRODYN	4-313 (5 ea.) 4-313A (1 ea.)		10
	TRANSDUCER. (See Metrology Records) Corrosion-resistant high range.	CONELECTRODYN	4-326-0008 (3 ea.)		10
	TRANSDUCER. Temp. range 15° - 150°F. Range 10,000 lbs. force. Single bridge.	ORMAND	WCLPB25CS1 (2 ea.) WCLPB24CS1 (1 ea.)		10
	TRANSDUCER. Temp. range 15°-150°F. Range 5,000 lbs. force. Single bridge.	ORMAND	WCLPB24CS5 (1 ea.)		10

ACL-83214	TRANSDUCER, PRESSURE. Capacity - 15,000 psig.	PHOTOCON RES.	925-1531	Y7 Anah	10
ACL-83270	TRANSDUCER. Load cell. White-standardized tension, internal pad, 350 OHM, single bridge range - 300 lb. force. Sensitivity - +1.9984 MV/V at full scale. Excitation voltage - 15 volts max. Temp. range - 15°F to 150°F.	OBMAND	WTLPF24CS3	Y7 Anah	10
ACL-83423	TRANSDUCER. 0-10,000 PSIA. Corrosion-resistant high range rated excitation - 10 VDC or AC RMS, 0-20 KC. Sensitivity - 4 MV + 20% - 10% open circuit. Output impedance - 350 OHMS ± 5% at room temp. Mating connector - furnish Bendix, pygmy PCS-06A-8-45 (SR).	CONELECTRODYN	4-326-0008	Y7 Anah	10
ACL-83427	TRANSDUCER, PRESSURE. 0-10,000 PSIA. Corrosion-resistant high range rated excitation - 10 VDC or AC RMS, 0-20 KC. Sensitivity - 4 MV + 20% - 10% open circuit. Output impedance - 350 OHMS ± 5% at room temp. Mating connector - furnish Bendix, pygmy PCS-06A-8-45 (SR).	CONELECTRODYN	4-326-0008 S/N 16094	Y7 Anah	10
ACL-82118	TRANSDUCER. Measures pressure from 0-15 to 0-5000 PSIA. Temp. range - 320°F to + 300°F. Sensitivity - 20 millavolts output +30%-10% open circuit.	CONELECTRODYN	4-313	Y2 Anah	10
ACL-82122	TRANSDUCER. Measures pressure from 0-15 to 0-5000 PSIA. Temp. range -320°F to +300°F. Sensitivity - 20 millivolt output +30%-10% open circuit.	CONELECTRODYN	4-313A	Y7 Anah	10

ACL-82867 ACL-82868	TRANSDUCER, PRESSURE. A miniature pressure transducer. Do not use where the shock & vibration amplitudes exceed 300 G's peak to peak - water cooled. Pressure ranges - 250 PSIG-5000 PSIG. Output up to ±10 volts at rated pressure. Linearity ±2% of full scale output. Accuracy ±2% of full scale output.	PHOTOCON RES.	755-2560 (2 ea.)	Y7 Anah	10
ACL-83059	TRANSDUCER. 0-10,000 psia. Corrosion-resistant high range rated excitation - 10 VDC or AC rms, 0-20 KC. Sensitivity - 4 MV +20%-10% open circuit. Output impedance - 350 OHMS ±5% at room temp. Mating connector - furnish, Bendix, Pygmy PCS -06A -8 -4S (SR).	CONELECTRODYN	4-326-0008	Y7 Anah	10
ACL-81065 ACL-81066	TRANSDUCER, PRESSURE. A gage pressure transducer. Range 0-10,000 psig. Max psig - 12,000. Ambient temp. limits -100° to +275°F. Full scale output - approx. 42 millivolts at 16 volts. Nominal bridge resistance - 350 OHMS.	STATHAM	PG10TC-10M (2 ea.)	Y2 Anah	10
ACL-81091 ACL-81092	TRANSDUCER, PRESSURE. A gage pressure transducer. 0-100 psig. Approx. nat. freq. - 5,000 CPS. Approx. vibratory acceleration sensitivity from 0 to 2500 CPS - 0.03% FS/g. Approx. static accel. sensitivity - 0.02% fs/g.	STATHAM	PG146TC-100-350 (2 ea.)	Y2 Anah	10
ACL-81093	TRANSDUCER, PRESSURE. A gage pressure transducer. Range 0-500 psig. Approx. natural freq. - 12,000 CPS. Approx. vibratory acceleration sensitivity from 0 to 2500 CPS - 0.02% FS/g. Approx. static acceleration sensitivity - 0.02% FS/g.	STATHAM	PG146TC500	Y1 Anah	10
ACL-81096	TRANSDUCER, PRESSURE. A gage pressure transducer. 0-3000 psig. Approx. natural freq. 18,000 CPS. Approx. vibratory acceleration sensitivity from 0-2500 - 0.02% FS/g. Approx. static acceleration sensitivity - 0.02% FS/g.	STATHAM	PG146TC-3M-350	Y2 Anah	10

ACL-81094	TRANSDUCER, PRESSURE. A gage pressure transducer. Range 0-500 psig. Approx. natural freq. 12,000 CPS. Approx. vibratory acceleration sensitivity from 0 to 2500 CPS - 0.02% FS/g. Approx. static acceleration sensitivity - 0.02% FS/g.	STATHAM	PG146TC500	109
ACL-81095	TRANSDUCER, PRESSURE. A gage pressure transducer. 0-3000 psig. Approx. nat. freq. 18,000 CPS. Approx. vibratory accel. sensitivity from 0-2500 GPS - 0.02% FS/g. Approx. static accel. sensitivity - 0.02% FS/g.	STATHAM	PG146TC-3M	109
ACL-82866	TRANSDUCER, PRESSURE. A miniature pressure transducer. Do not use where the shock and vibration amplitudes exceed 300 G's peak to peak - water cooled. Pressure ranges - 250 psig - 5000 psig. Output - up to ± 10 volts at rated pressure. Linearity ±2% of full scale output. Accuracy ±2% of full scale output.	PHOTOCON RES.	755-2560	109
	TRANSDUCER. 60,000 psig. -65-250°F Uncooled. Impedance input 350 ±10% & nominal F.S. output 55 MV ±20%. 1 1/16"- 16 VN - 2A thread. Max. torque 42 ft-lbs. welded diaphram. Pigtails. K seal.	NORWOOD	Mod.#114 (2 ea.)	109
ACL-82099	VELOMETER, ALNOR. For measurement of the velocity and pressure of air. Calibrated for standard tubes 28 inches long. For low velocity use no attachments. Read on "no jet" scale 0-200 or 0-300 FPM.	ILL. TEST LAB.	3002-10	109
ACL-82470	VISICORDER. 24 channel - direct reading oscillograph. Freq. 0-5000 cycles. Writing speed-beyond 25,000 in. per sec. spot velocity. Linearity ±2% if reading with deflection of 4" or less. Power 105-129 volts, A.C. - 60 cycles, 600 watt (approx.)	HEILAND DIVISION	1108-20678	109

NC-58868	VISICORDER. 24 channel - direct reading oscillograph. Freq. 0-5000 cycles. Writing speed - beyond 25,000 inches per second spot velocity. Linearity ±2% of reading with deflection of 4" or less. Power 105-129 volts, A.C., 60 cycles, 600 watt (approx).	HELLAND DIVISION (HONEYWELL)	1100-20678	Y7 Anah	109
ACL-83453	VISICORDER. 36 channel oscillograph. 15 forward speeds (0.0 to 160 inches per second), 10 reverse speeds (0.1 to 16 inches per second).	HELLAND DIVISION (HONEYWELL)	16[illegible]	Y7 Anah	109
ACL-83506	VISICORDER. A multi-channel general purpose oscillograph. Direct reading. Has freq. range 0 to 5000 CPS in Model 906-1 and 0-2000 CPS in Model 906-2. Has 14 galvanometer positions with 906-1 and eight with Model 906-2. Crosstalk - less than 1% between channels. Requires 105-125 volts, 60 cycles, 9 AMPS.	HELLAND DIVISION (HONEYWELL)	906C S/N 9-10395	Y2 Anah	109
ACL-83560	VOLTMETER, AC. Rated accuracy - 75% horizonal position. Movable iron (shielded from external magnetic fields). Power consumption - 1500 volts range at 115 volts, 60 cycles, 2.5 watts, 2.5 volt-amperes.	WESTON	433		109
UAF-74419	VOLTMETER, AC. Rated accuracy of 0.25% of full scale. Horizonal position electrodynamometer (shielded from external magnetic field).	WESTON	341		109

ACL-81929	VOLTMETER, AC. $4\frac{1}{2}$" hand drawn scale, mirrored with knife edge pointers. High accuracy ±1% of full scale in horizonal position. Max. volts single range 0-150, double range 0-150-300, triple range 0-75-150-300 or 0-150-300-600.	SIMPSON	880		10
FRC 1589-3 FR 1589-4	VOLTMETER, AC-DC. Rated accuracy of 0.25% of full scale. Horizonal position electrodynamometer (shielded from external magnetic field).	WESTON	341 (2 ea.)		10
ORD 643-68-135 ACL-81865	VOLTMETER, DC. Indicates absolute volts. Accuracy $\frac{1}{2}$ of 1% of full scale at 25°C. Volt range 2-5, 10-20, 50-100, 200, 500. Resistance OHMS at 25°C 1000 OHMS per volt.	WESTON	622(2 ea.)		10
ACL-81931 ACL-81930	VOLTMETER, DC. $4\frac{1}{2}$" hand drawn scale, mirrored with knife edge pointer. D'Arsonval movement. Accuracy $\pm \frac{1}{2}$ of 1% of full scale in horizontal position. Range volts - 50, 100, 150, 300. Double range volts - 15-150, 150-300, 300-750. Triple range volts - 15-150-300, 150-300-600.	SIMPSON	9		10
UAF-66980 UAF-32015 UAF-32014 ORD-643-68-136	VOLTMETER, DC. Indicates absolute volts. Accuracy - $\frac{1}{2}$ of 1% of full scale at 25°C. Volt range 2-5, 10-20, 50-100, 200, 500. Resistance OHMS at 25°C 1,000 OAMS per volt.	WESTON	622(4 ea.)		10
NC-056259	X-RAY, FLASH SYSTEM. Flash radiography of events up to 40,000 ft/sec. 3 Channel. Cabinet mounted. Pulser power. 115 VAC, 60 cycle, 75 watt. 2' long, 2' wide, $5\frac{1}{2}$' high.	FIELD EMISSION CORP.	730-3-C/232	Y7 Anah	10

MC-47033	X-RAY UNIT. 140 KVP, 115 VAC, 60 cycle, C-H, 3 ld exp. proof con. Output variable 70-140 KV at .2A. 13½" long, 9½" wide, 9½" high.	GENERAL ELECTRIC	Control LM140 Head 11AD5B	Y7 Anah	10[illegible]

CONTROL NO.	NOMENCLATURE	MANUFACTURER	MODEL/TYPE	FACILITY	CODE
OL-107	MAGNIFIER, LAMP Adjustable fluorescent lamp with magnifying glass. 118 volts - 5 AMP. Uses 6W small fluorescent lamps. 2 ld. con. Clamps to table. Ext. arms with 4' reach.	LUMO LAMP CORP.	209	Y7 Anah	110
	MICROSCOPE, TRINOCULAR. Std. microscope with 4 objectives (40X, 100X & 1000X oil immersion). Trinocular head permits adapting for photomicrography.	ELGEET	EC		110
NC-056370	MOTION ANALYZER. Magnification = 16X. Picture size 6.00x8.50 w/16MM film transport head. Readings = inches, tenths, & thousandths at screen. Medium prefocus base. 110 volt AC. 60 cycle, 300 W - lamp.	VANGUARD INSTR. CORP.	M-16C S/N 684	Y2 Anah	110
	PHOTOFLUOROMETER. Analytical instrument to measure fluorescence of materials. Capable of determining concentration in μ gm range. Equiped with external galvonometer for increased sensitivity.	COLEMAN	12C		110

LAB. FACILITIES

CONTROL NO.	NOMENCLATURE	MANUFACTURER	MODEL/TYPE	FACILITY	COD
OL-130 OL-131 OL-132	CABINET, GLASSWARE. Store glassware. 47"x30"x12". sliding glass doors.		(3 ea.)	Y2 Anah	111
NC-43874	CABINET, GLASSWARE Storing glassware. 6½'x4'x18" sliding doors.			Y7 Anah	111
NC-43865 NC-43866 NC-43867 NC-43868 NC-43869 NC-43870 NC-43871 NC-43872 NC-43873	CABINET, LAB WORK. Equipped with vacuum, gas and air con. and cold water. 4 dual C-H 3 ld. exp. proof con. 20' long.		(9 ea.)	Y7 Anah	111
OL-76	CABINET, LAB WORK. 12' long sink and slate top.			Y2 Anah	111
NC-43864	HOOD, VENTILATED. Enclosed.Sliding glass door. Gas, air, hot & cold water. 46"x27" work space, 4'x3½'x6'.			Y7 Anah	111
OL-139	LIGHT, FLUORESCENT.	DAZOR MFG.	P2134	40' Trailer Riverside	111
NC-056452	STEAM JENNY. Heat melt kettle. Kerosene fired. 100 psig.	KRIEGER	Super 750	Riverside	111
NC-56423	TRAILER, FIRE FIGHTING. 100 gal, 600 psig, 6 gpm. Gas powered pump. 150' x 1½" dia. hose with nozzle.	JOHN BEAM DIV. FMC	Mod. 101FD S/N J72888	Riverside	111

CTP-668	TRAILER, SEMI-VAN. 8' wide, 21' long, 6'6" high. Fluor. lights, exh. fan, A/C, Siren, Red Light. Wired for 110 & 220 VAC. Insulated.	2 L8-2	Ft. Irwin	111
NC-056424	TRAILER, VAN. 8'x40'x90" high, insulated, A/C.	TRAILMOBILE	Riverside	111

Date 23 September 1968 No. 6773-T-3-A

Supersedes

ORDNANCE OPERATING INSTRUCTIONS Date 5 January 1968 No. 6773-T-3

MULTI-SHOT PORTABLE FLAME WEAPON
WARHEAD LAODING, SK 36848

Operator No. 1

Step

1. Remove warheads from shipping cartons.
2. Remove plug, filler.
3. Purge warhead with nitrogen and replace plug.
4. Insert warhead in chute on back of dry box.

Operator No. 2

Step

1. Remove warhead from chute.
2. Remove plug filler.
3. Place warhead under filler nozzle and on weight device.
4. Push fuel-flow start button (F-G).
5. When proper weight is reached, weight device will activate switch, which will shut off fuel-flow. (864 $\pm$ 15 grams)
6. Remove warhead from filler nozzle, insert and tighten plug filler.

Operator No. 1

1. Remove warhead from dry box.
2. Stake and epoxy plug.
3. Replace in cartons and transfer to assembly area.

Prepared by:

D. A. Mott, Supervisor
Ordnance Laboratory Unit
Orgn. 6773, Y34

Approved by:

A. L. Van Der Most
Safety Administrator

Date 23 September 1968 No. 6773-T-6-A

Supersedes

ORDNANCE OPERATING INSTRUCTIONS Date 16 February 1968 No. 6773-T-6

MULTI-SHOT PORTABLE FLAME WEAPON
CLIP AND ROUND ASSEMBLY, SK 36623

NOTE: Clip support and strap assembly have been previously assembled at Anaheim. In addition, the threads of the AN3C4A bolt will have been primed at Anaheim.

1. Postion four (4) round assemblies in clip tubes. Place cap, tube over igniter pigtail and seat into tube by adjusting cut flats to their proper position, before installing igniter pigtail coat with RTV102 per B/P SK 36623, Detail A.

2. Position manifold cover assembly over rear face of manifold. Secure in place using (3) MS 20033-1 Screw, Cap, (3) MS 15795-808 Washers, (1) MS 24693-C272 Screw and Loctite (Grade AVV) Torque per B/P SK 36623, Note 5.

3. Put retainer plug into an oven (127°C) for approximately 5 minutes. Remove from oven.

   Put retainer plug into retainer cup and position this assembly over nozzle end of round with the igniter pigtail located in its proper slot, as provided.

4. Place the assembly on the arbor press and seat all four retainers. Position igniter pigtails into their respective holes in clip manifold.

Prepared by:

D. A. Mott, Supervisor
Ordnance Laboratory Unit
Orgn. 6773, Y34

Approved by:

A. L. Van Der Most
Safety Administrator

EST WORK ORDER
M 20-216 JUL 7/60

CODE IDENT. NO.

TYPE: RELEASE	NUMBER: 5202	
BJECT: XM191 Multishot Portable Flame Weapon Acceptance Testing	ETO	
	SALES ORDER: 1173-7102	
NDOR QUALIFIED? ☐ YES ☐ NO	VENDOR NAME: Nortronics	VENDOR NO.
MODEL		
STING ACTIVITY: Nortronics	EFFECTIVITY TO (INCL)	
ST WITNESSES: Nortronics, DCAS	SUPERSEDED BY TWO. NO. AT (INCL)	SUPERSEDES TWO. NO. AT (INCL)
PE OF TEST REPORT: Written	TEST REPORT DISTRIBUTION: Reed, Hock, QA, DCAS	PAGE OF

The attached procedure describes the weapon acceptance test requirements for the Portable 66MM Multishot Flame Weapon, XM191 and the Clip-Round Assembly, XM74.

REVISIONS

CHANGE LETTER	DESCRIPTION OF CHANGE	APPROVALS			
		NSS	DATE	CUSTOMER	DATE

ORIGINAL RELEASE APPROVALS

OFFICE	SECTION	APPROVAL SIGNATURES	DATE
QUESTING			
ORDINATING			
HER			
HER P.A.	6610	R. Clute Product assur.	9-26-68
OD. ENGINEERING	6791	Terry Reed	9.26.68
OJECT OFFICE			
R. LABORATORIES			RELEASE

XM-191
MULTISHOT PORTABLE FLAME WEAPON
ACCEPTANCE TESTING
(ITWO 5202)

I. LAUNCHER ASSEMBLY - SK 36680

A. The launcher assemblies will be mechanically tested for compliance to all operation requirements of the trigger, ratchet and firing pin assemblies. The test procedure will be as follows:

1) Assemble a complete firing mechanism in a launcher. Actuate the mechanism and adjust the stroke using the adjustment link provided. (See figure 1).

2) Adjustment will be accomplished by determining the cable position where maximum trigger overtravel is experienced while maintaining proper mechanism sequencing operations.

B. Bore Sight Requirements

Each launcher will be subjected to bore sighting in accordance with the following procedure:

BORE SIGHT PROCEDURES
REQUIRED EQUIPMENT

1. Launcher stand-bore sighting - Figure 2.

2. Range marker-Greek cross - Figure 3 (Ref. DWG 35786) (Cycle Inspection)

3. Bore sight tube assembly. Figure 4 - (Ref. DWGS SK 34883 and SK 34884) (Cycle Inspection).

4. Gunners Quadrant - ORD # M-1-22238 (Cycle Calibration)

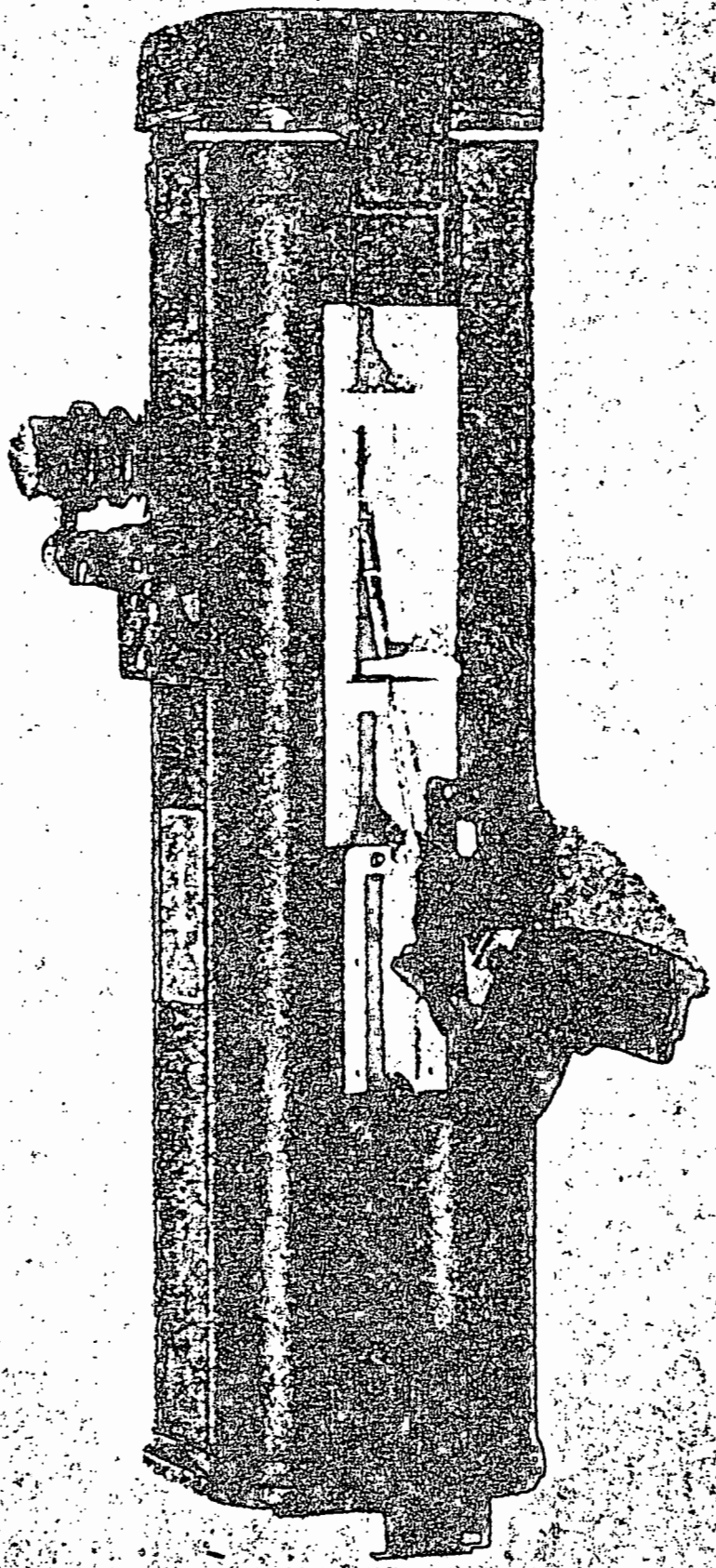
5. Launcher Assembly - SK 36680

6. 100-foot tape measure

7. Slot type & Phillips Head screw driver and adjustable wrench

8. Round Ballistic Chart. Figure 6.

ITEM NO.	ITEM	CHECK OFF
1.	Set launcher stand in place and secure the empty launcher to stand. Figure 2. (Ref. DWG SK 35787)	
2.	Measure downrange distances 50 and 100 yards from the launcher muzzle, and mark each distance.	



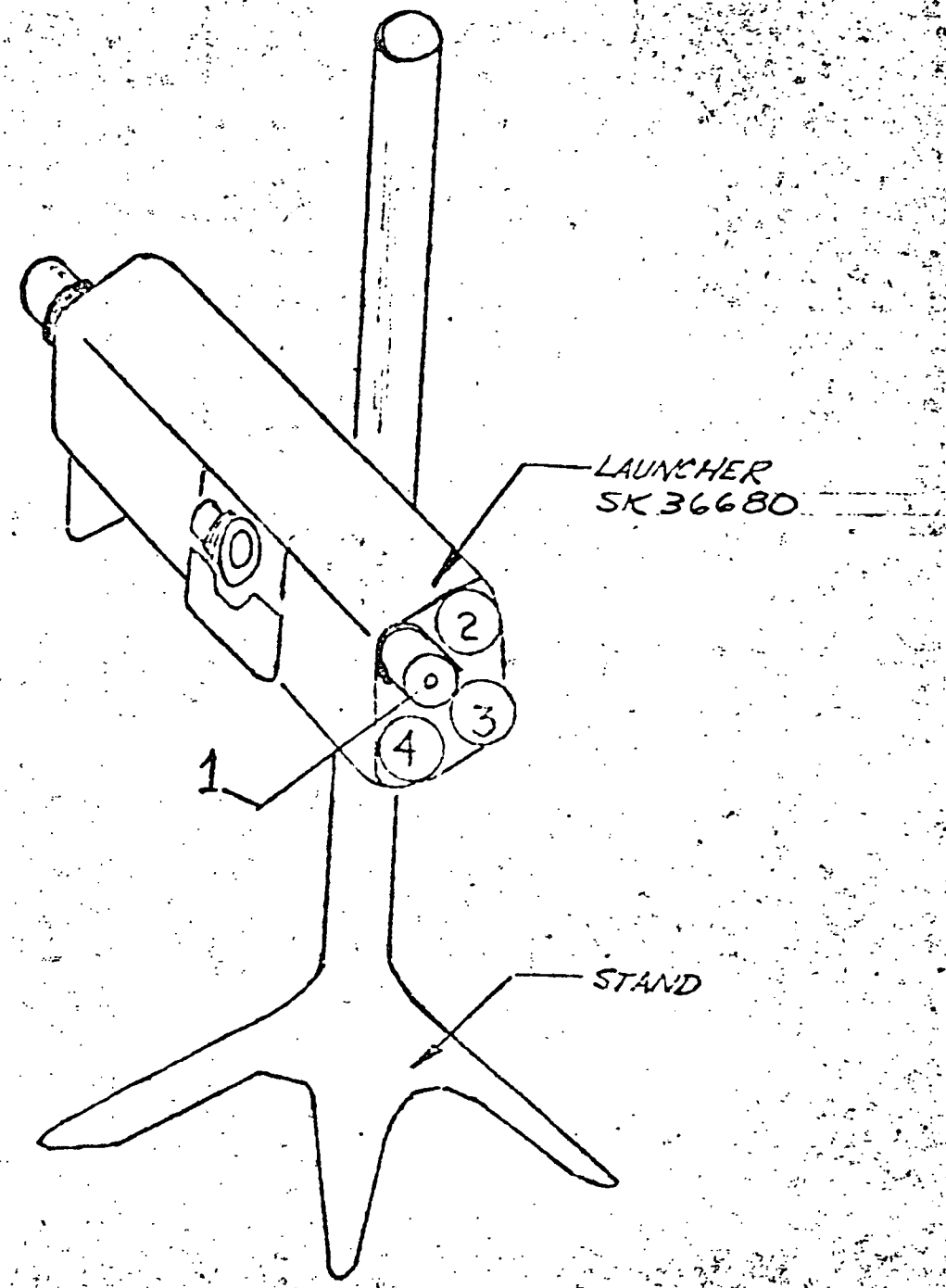


FIG. 2 LAUNCHER
BORESIGHTING STAND

ITEM NO.	ITEM	CHECK OFF
3.	Place flat plate, with Greek cross, figure 3, at the 100 yard marker at approximately the same height as the launcher barrels.	
4.	Insert the bore sight tube, figure 4, in the launcher barrel No. 1 (see figure 2) and extend the sight mounted on the launcher. Set the launcher at zero degrees elevation. Check launcher level position with the gunner's quadrant.	
5.	Align the bore sight tube cross hairs with the Greek cross located downrange by adjusting the position of the Greek cross in elevation and azimuth.	
6.	Release the lock nut on the sight azimuth adjustment screw and stop screw (figure 5). Turn slotted screw on the sight azimuth adjustment until the vertical hairline on the M-20 sight reticle is aligned with the vertical line on the Greek cross. Secure lock nut on the sight azimuth adjustment and stop screw.	
7.	Return the sight to the closed position then extend and check the azimuth setting. If setting is not as originally set, repeat step 6 and 7.	
8.	Release the two phillips head screws on the sight swivel plate which allow for the elevation adjustment.	
9.	Set the horizontal line marked 0 yards on the sight reticle so that it is aligned with the horizontal line on the Greek cross, by adjusting the sight in elevation.	
10.	Secure the lock the two screws on the mounting plate swivel which permanently fixes the sight elevation.	
11.	Unlatch the launcher stand elevation lever and align the sight reticle at the 100-yard range mark with the Greek cross located 100 yards downrange by moving the launcher in elevation. Secure the launcher stand elevation lever.	
12.	Place the gunners quadrant on the launcher and record the elevation reading. Remove gunners quadrant.	
13.	Compare this value with the round ballistic chart, figure 6. Agreement within 3.0 mils should be attained.	
14.	Place the sight in the closed position and check the elevation setting. If setting is not as originally placed repeat steps 8 through 14.	
15.	Move the Greek cross marker, figure 3, to the 50 yard position as a reference check only.	
16.	Adjust the elevation of the launcher by unlatching the launcher stand elevation lever and moving the launcher in elevation to zero degrees. Check launcher position with gunners quadrant. Superimpose cross hairs of the M-20 sight on the Greek cross, by moving the position of the Greek cross.	
17.	Check the azimuth position of the M-20 sight for reference only.	
18.	Check M-20 sight elevation by superimposing the Greek cross horizontal	

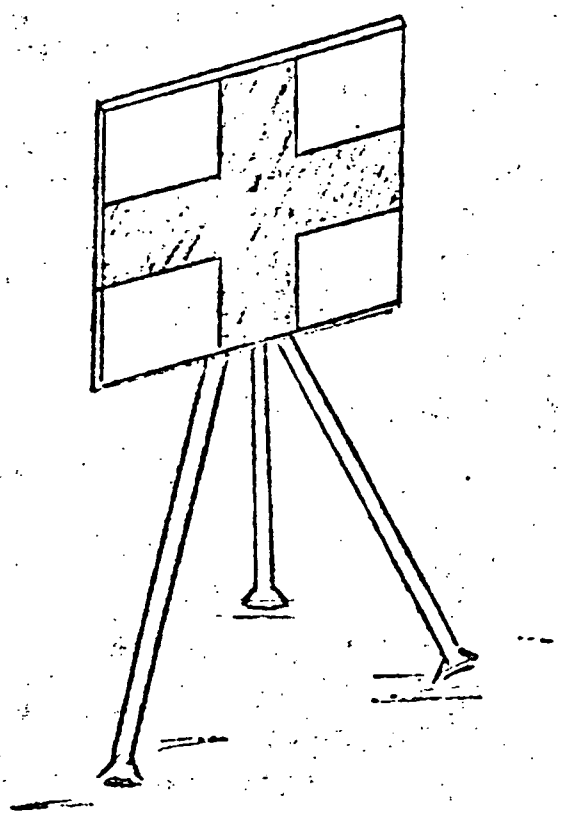
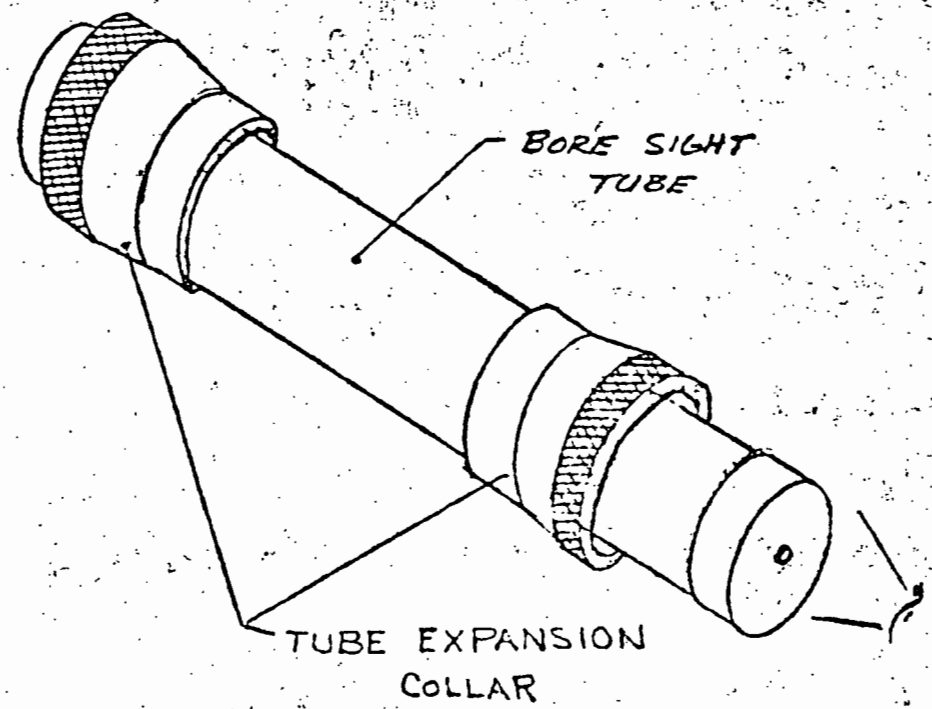


Figure 3. GREEK CROSS RANGE MARKER
(REF. SK-35786)
(CYCLE INSPECTION)



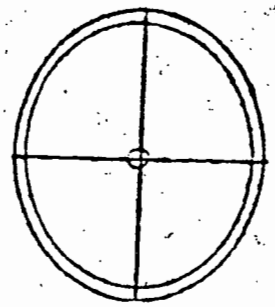


Figure 4. BORESIGHT TUBE ASSEMBLY
(REF DWGS SK-34883 & 34884)
(CYCLE INSPECTION)

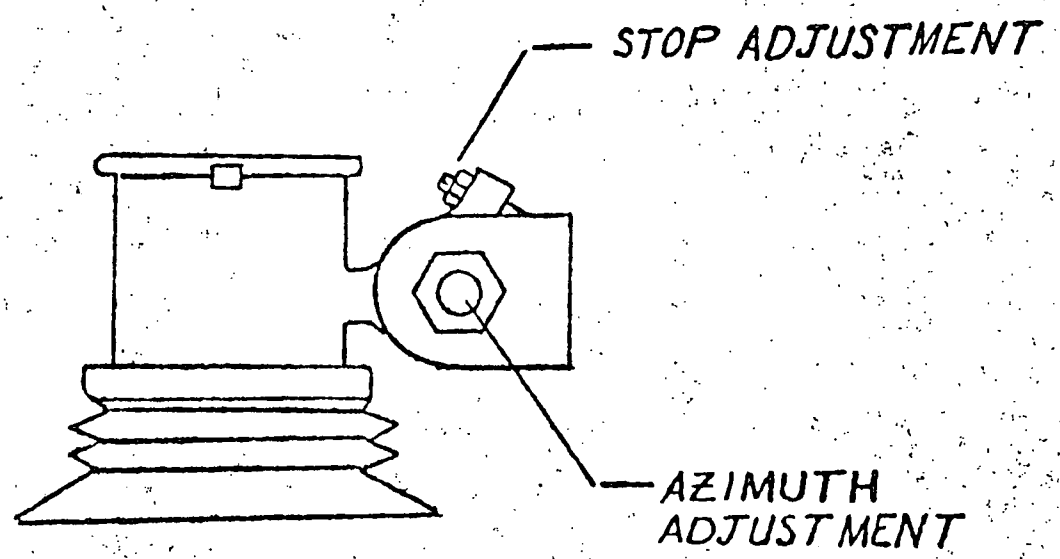


FIG. 5
SIGHT MECHANISM

MULTISHOT PORTABLE FLAME WEAPON
ROUND BALLISTIC CHART

RANGE			QUADRANT ELEVATION	
FEET	YDS	METERS	MILS	DEGREE
75	25	22.9	9.1	.51
150	50	45.7	19.6	1.10
225	75	68.5	30.2	1.70
300	100	91.4	42.0	2.36
375	125	114.2	53.4	3.00
450	150	137.1	65.0	3.66
525	175	160.0	76.6	4.31
600	200	183.0	88.8	5.00
675	225	206.0	101.3	5.70
750	250	228.5	114.2	6.42
825	275	251.8	127.9	7.18
900	300	274.1	141.0	7.93

FIGURE 6.

ITEM NO.	ITEM	CHECK OFF
	line with the M-20 zero range mark (reference only).	
19.	Unlatch the launcher elevation lever and superimpose the M-20 sight 50-yard range mark with the Greek cross horizontal range mark (reference only).	
20.	Place the gunners quadrant on the launcher and record the elevation angle. Remove the gunners quadrant (reference only).	
21.	Compare the value obtained from step 20 with the round ballistic chart. Agreement within 3.0 mils should be obtained. (Reference only). If agreement is not attained steps 8 through 14 should be checked.	
22.	Place the bore sight tube in launcher tube No. 2 and align the cross hairs of the bore sight tube with the Greek cross by adjusting the launcher stand. Check the M-20 sight azimuth as reference only.	
23.	Place a scribe mark on the sight mounting plate opposite the indexed mark on the launcher after all bore sighting operations have been completed, per figure 7.	

C. Each launcher will be functionally tested for proper operational characteristics after all assembly and adjustment has been completed.

1) Place a test primer block with four M29A1 primers located in suitable holders within the igniter cavity in place at the rear of the launcher. Secure in place using a clip latch. See figure 8.

2) Operate the trigger assembly firing all four pins.

3) Acceptance is based on satisfactory operation of the mechanism and initiation of all four primers.

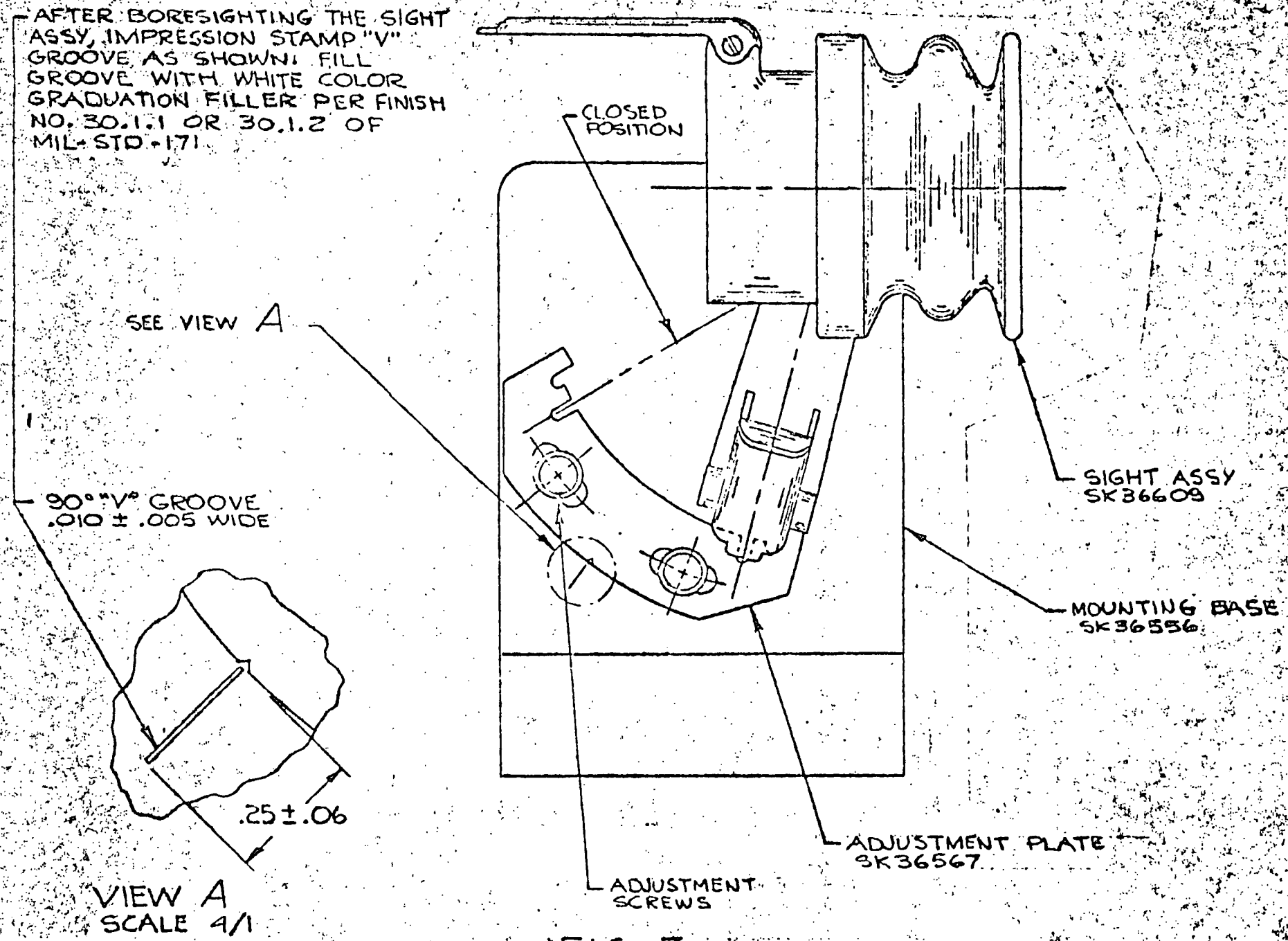


FIG 7

INDEX LINE ON SIGHT ASSEMBLY BASE

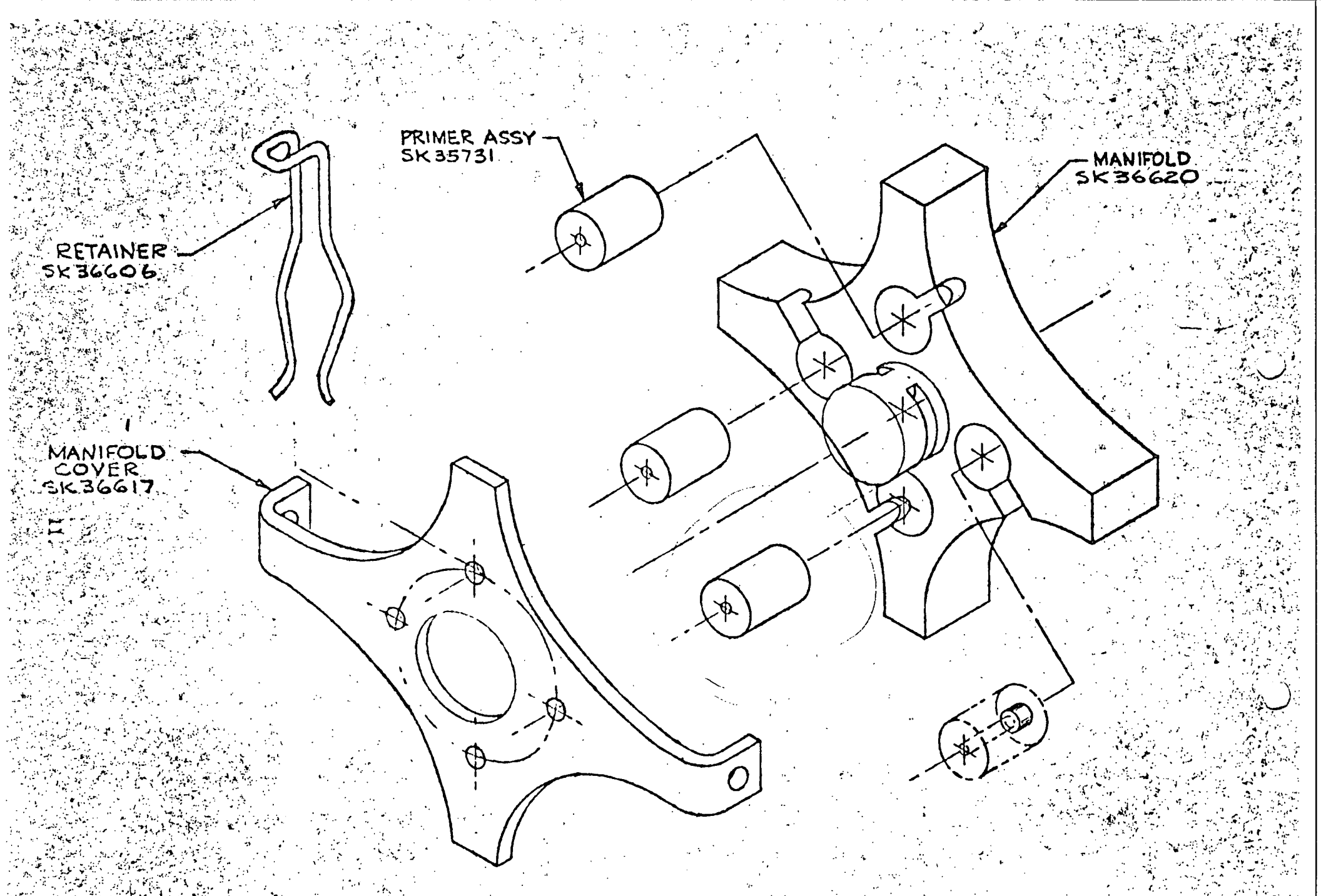


Figure 8. LAUNCHER FUNCTIONAL TEST SET-UP

II. TRIETHYLALUMINUM - VISTANEX BLEND ACCEPTANCE (REF. DWG SK 36848).

A. Each batch of pyrophoric thickened triethylaluminum will be blended in accordance with the established SOP issued by Ordnance Test Unit, Dept. 6773, Nortronics Procedure 6773-T-2.

B. Each blend will be tested using double samples to verify fuel viscosity and percentage thickener.

1) Viscosity measuring procedure.

a) Equipment required includes:

1. Canon Fenske No. 700 Viscometer tube (calibrated)
2. Temperature Control Bath held at 40° C and filled with Amaco 350 solvent.
3. Standard thermometer
4. Timer for measuring efflux time
5. Miscellaneous laboratory materials of bottles, pipettes, flasks, etc.
6. Dry box with associated plumbing and nitrogen apparatus.

b) The testing procedure is described in American Society for Testing Materials, "Test for Kinematic Viscosity (D445-53T)", Appendix A. This test is performed in a dry box under an inert atmosphere.

c) The viscosity is obtained using the following formula and will be recorded. Kinematic Viscosity = Efflux time x viscometer constant.

2) Percentage thickener measuring procedure

a) Equipment required:

1. 600 ml beaker, sepratory funnel

2. 20cc syringe

3. Distilled water, concentrated HCL, Hexane

4. Hand blower

5. Dry box and associated plumbing

b) Testing procedure

1. Pour 300 ml hexane into a 600 ml beaker

2. Fill a 20cc syringe with 10cc of thickened triethylaluminum fuel.

3. Inject TEA into hexane slowly while stirring the mixture with a glass rod.

4. Mix 11 parts H_2O with 1 part HCL.

5. Add 120 ml of diluted HCL to fuel-hexane mixture

   Note: Steps 1 through 5 are performed in a dry box under an inert atmosphere.

6. Stir mixture until fully blended and pour into a sepratory funnel.

7. Slowly open funnel stopcock until mixture discharges at a steady drip into a beaker with 111cc of diluted HCL.

   Note: Monitor temperature. Stir mixture during agent addition to insure temperature does not exceed 50°C.

8. Pour mixture back into sepratory funnel. Shake mixture being careful to vent the funnel in accordance with good laboratory technique practices.

9. Allow the mixture to separate. Drain the lower H_2O level off and discard.

10. Repeat addition of 120 ml of diluted HCL shaking and deletion of H_2O level until solution becomes clear. (Approximately four times counting initial cycle.)

11. Discharge clear solution in sepratory funnel into clean tared beaker. Allow the hexane to evaporate using a hand blower to elevate the temperature.

12. Place beaker in a vacuum box and allow to cool. Weigh content.

13. Percent vistanex can now be calculated using the following relationship:

$$\% \text{ vistanex} = \frac{\text{Tared weight}}{\text{wt 10cc fuel}}$$

3) Acceptance criterion

a) Percentage of vistanex as obtained from B.2 shall be between 5.5% and 6.5%.

b) The viscosity measurement will be recorded and used for informational purposes for possible future application. This viscosity level shall not be lower than 70,000 centistokes when measured using the procedure outlined in B.1.

III. ROUND ACCEPTANCE TESTING (REF. DWG SK 36848).

A. At least one warhead from each one hundred manufactured, provided one is selected from each fuel batch, will be subjected to functional acceptance testing, in accordance with requirements of QA procedure 2.3.1.

1. The test sample will be mounted on a stand in the test arena, a burster charge modified for electrical leads will be attached to the initiator.

2. The warhead will be statically tested by initiating the burster and disseminating the flame agent.

3. The dispersion pattern will be noted, the agent burn time recorded, and visual assessment of the ignition characteristics performed.

4. Proper safety precautions will be enforced during performance of the test. These precautions will include:

a) Proper safety attire of glasses and hard hats while in the test area.

b) The test item will be kept in an unarmed state until the area is clear of all personnel except one. This will be done by shortening the detonator lead wires.

c) All personnel in the area will be alerted just prior to the test by a portable warning device.

d) Immediately prior to test sample arming, the firing lines will be shorted. The detonator leads of the test item will then be attached by the one man remaining in the test area.

e) Upon arrival of the test technician of (d) above to the control area, the firing leads will be attached to the initiating circuit.

f) All personnel will be notified of the intent to fire, a proper countdown used and the test sample initiated.

g) After firing, the firing leads will again be shorted at the control.

h) The test arena will be inspected for general pattern and flame duration.

i) All burning agent will be expended or extinguished prior to commencement of the next test.

j) In the event of a misfire, all personnel will be kept out of the test area for ten (10) minutes. After expiration of this time, the firing leads will be shorted and one test technician will enter the arena and remove the burster from the test sample. The firing circuit will be checked, a new burster assembly installed and the test sequence repeated.

k) Upon conclusion of all tests, all personnel in the area will be notified by actuation of the portable warning device.

5. The test area will be cleared of brush for a distance of seventy (70) feet in each direction from the test center. Any structures within this area will be protected from flame impingement. If necessary, cellotex screens can be used to contain the agent at a distance not less than 30 feet from the test sample.

B. Acceptance will be based on witnessing of the test to ascertain agent ignition and dissemination, and review of the burn time duration. Data gathered during the acceptance testing including remarks of visual assessment will be tabulated for possible future use.

Approval of Test Safety Provisions - Items III.A 4 and 5.

Approved Feb. 9, 1968
on ITWO 4997

A. Van der Most
Safety Administrator

D. Mott, Supervisor
Ordnance Test Unit

J. T. Laurie, Chief
Mechanical Equipment and
Support Group

ORDNANCE OPERATING INSTRUCTIONS

TEA BLENDING AND LOADING

I. General

1.1 All tooling and equipment and containers used for TEA operations shall be approved prior to installation and immediately prior to start of each operation.

1.2 Explosive Limits
- 1.2.1 Quantity Limits - [illegible]# TEA
- 1.2.2 Personnel Limits - 2 assigned
  - 2 transient
- 1.2.3 No other explosives or explosive components are permitted in work area.

1.3 Housekeeping shall be such to keep all unnecessary materials and supplies out of the work area and equipment shall be arranged so as to keep a clear means of egress from the building.

1.4 Transfer, handling and storage must be performed by at least two persons.

II. Equipment Required

2.1 Tooling and Special Equipment
- 2.1.1 Glove Box
- 2.1.2 Blender
- 2.1.3 Holding Tank and Transfer System
- 2.1.4 Nitrogen Dryer
- 2.1.5 Hand Tools as Required
- 2.1.6 Nitrogen (dry pumped)
- 2.1.7 TEA in ICC shipping Container
- 2.1.8 Hexane for Decontamination and Cleanup
- 2.1.9 Mineral Oil for Immediate First Aid
- 2.1.10 Dry Chemical (Ansul Met-L-Kyl) Fire Extinguishers (1 - 30#; 1 - 150#)
- 2.1.11 Brookfield Synchro-Lectric Viscometer
- 2.1.12 Ohaus 500gm Balance
- 2.1.13 300# Cap, Bench Type, Platform Scale

2.2 Personal Protective Equipment Required
- 2.2.1 Insulated Protective Clothing (full suit) for Hook-[illegible]
- 2.2.2 Eye Protection Approved for Chemical Splash to be Worn at All Times in Work Area
- 2.2.3 Flame [illegible] Coats to be Worn at All Times in Work Area

III. Procedure

3.1 The following operations shall be accomplished in accordance with the refereced check lists (CL).

3.2 Charge mixer with TEA and Vistanex and blend (CL#1).

3.2 Transfer mix to holding tank - CL#2.

3.3 Load Warheads and check for leaks - CL#3.

3.4 Package and remove to holding area - CL#4.

3.5 Shut down and clean-up - CL#5.

Prepared by:

D. A. Mott 10/9/67
D. A. Mott, Supervisor
Ordnance Laboratory Unit, Y6773

Approved by:

A. L. Van Der Hoek
Safety Administrator

J. T. Laurie
J. T. Laurie, Chief
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B. Karin
B. Karin, Director
Ordnance Systems Section

6780-7-239/JAR:ls
20 October 1967
Pilot

STANDARD OPERATING PROCEDURE
FOR
FIELD TEST EVALUATION
OF THE
MULTISHOT PORTABLE FLAME WEAPON

SCOPE: This procedure describes in detail the sequence of events necessary to assemble, load and fire the Multishot Portable Flame Weapon in the field. This procedure has been segregated into the following general areas for convenience.

I - Round Assembly

II - Clip Assembly

III - Launcher Operation - Static Test Stand

IV - Launcher Operation - Man Fired

V - Hangfire

Prepared:

J. A. Reed, Project Engineer
Multishot Portable Flame Weapon Program

Approved:

J. Hock, Supervisor
Ordnance Test Unit

Approved:

A. A. Hodgson, Chief
Advanced Weapons Development Group

A. L. Van Der Most (Approval for Pilot Only)
Safety Administrator

B. Karin, Director
Ordnance Systems Section

J. T. Laurie, Chief
Mechanical Equipment and Support Group

STANDARD OPERATING PROCEDURE
MULTISHOT PORTABLE FLAME WEAPON FIELD ASSEMBLY

I. ROUND ASSEMBLY CHECK LIST

Item No.	Item	
Safety	No smoking in area which is designated as warhead assembly area.	
	Inspect to see that adequate signs are posted informing personnel of the round assembly operation.	
	Wear safety glasses while assembling round.	
1.	Insert fuze assembly (fuze plus burster charge) in the warhead fuze well. (See figure 1).	
2.	Prior to connecting the rocket motor (M-54) section insure that the fuze assembly is properly seated in the warhead fuze well. If the fuze assembly does not properly seat itself in the warhead fuze well, remove and replace with another fuze assembly. In event the second fuze assembly does not properly seat itself in the warhead fuze well place warhead aside for additional inspections.	
3.	Connect rocket motor (M-54) and adapter assembly to the warhead. (Right hand thread) screw hand tight.	
4.	Weigh and ballast the round. Make note of these values on the test data sheet in accordance with the warhead number.	
5.	Place assembly in storage tube until round is ready for use.	

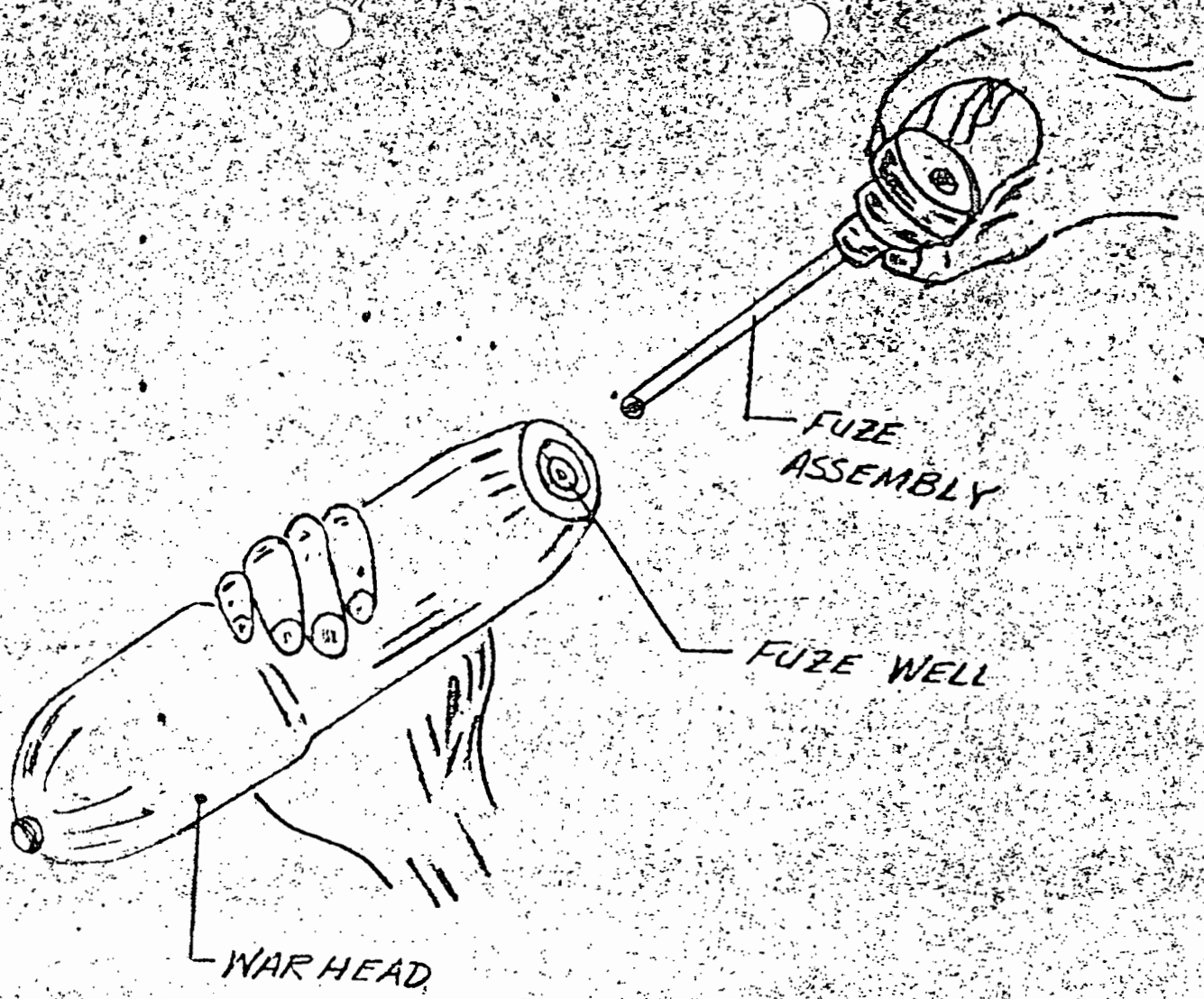


FIGURE I-1 ASSEMBLY OF FUZE & BURSTER CHARGE INTO WARHEAD

STANDARD OPERATING PROCEDURE
MULTISHOT PORTABLE FLAME WEAPON FIELD ASSEMBLY CHECK LIST

II. CLIP ASSEMBLY

Item No.	Item	
Safety	No smoking in the area which is designated as the clip assembly area. Inspect to see that adequate signs are posted informing personnel of the clip assembly operation. Wear safety glasses while assembling the clip.	
1	Remove the aft plate on the clip assembly by detaching the four mounting screws.	
2	Partially insert (about one (1) inch) the aft end of the round (nozzle-fin section of the M-54 rocket motor) into the forward end of one of the four tubes in the clip assembly with the primer face of the M-56 igniter pigtail facing in towards the weapon center. (See figure 1.)	
3	Remove the fin restrictor cover (Shroud) from the rocket motor (M-54) by sliding over the warhead section.	
4	Slide the round into the clip assembly tube until the external step on the warhead surface evenly mates with the end of the clip inner tube (see figure 2).	
5	Place the M-56 igniter pigtail primer cap into the recessed cup in the aft section of the clip assembly primer face down. Check to insure the primer cap is properly seated into the clip primer manifold recesses provided. In event proper seating of the primer cap cannot be achieved by using the hands, remove the warhead from the tube and repeat steps 2 through 5 using a new round assembly. In event that the second round primer cap does not properly seat itself into the clip primer manifold recess, set the clip assembly aside for additional inspection.	
6	Load the remaining three tubes of the clip assembly in accordance with steps 1 through 5 of this procedure.	
7	Place the aft plate of the clip assembly in position and fasten with the four screws (turn clockwise to tighten).	
8	If immediate use of the loaded clip assembly is not anticipated, store in a magazine until required for use in the weapon system.	

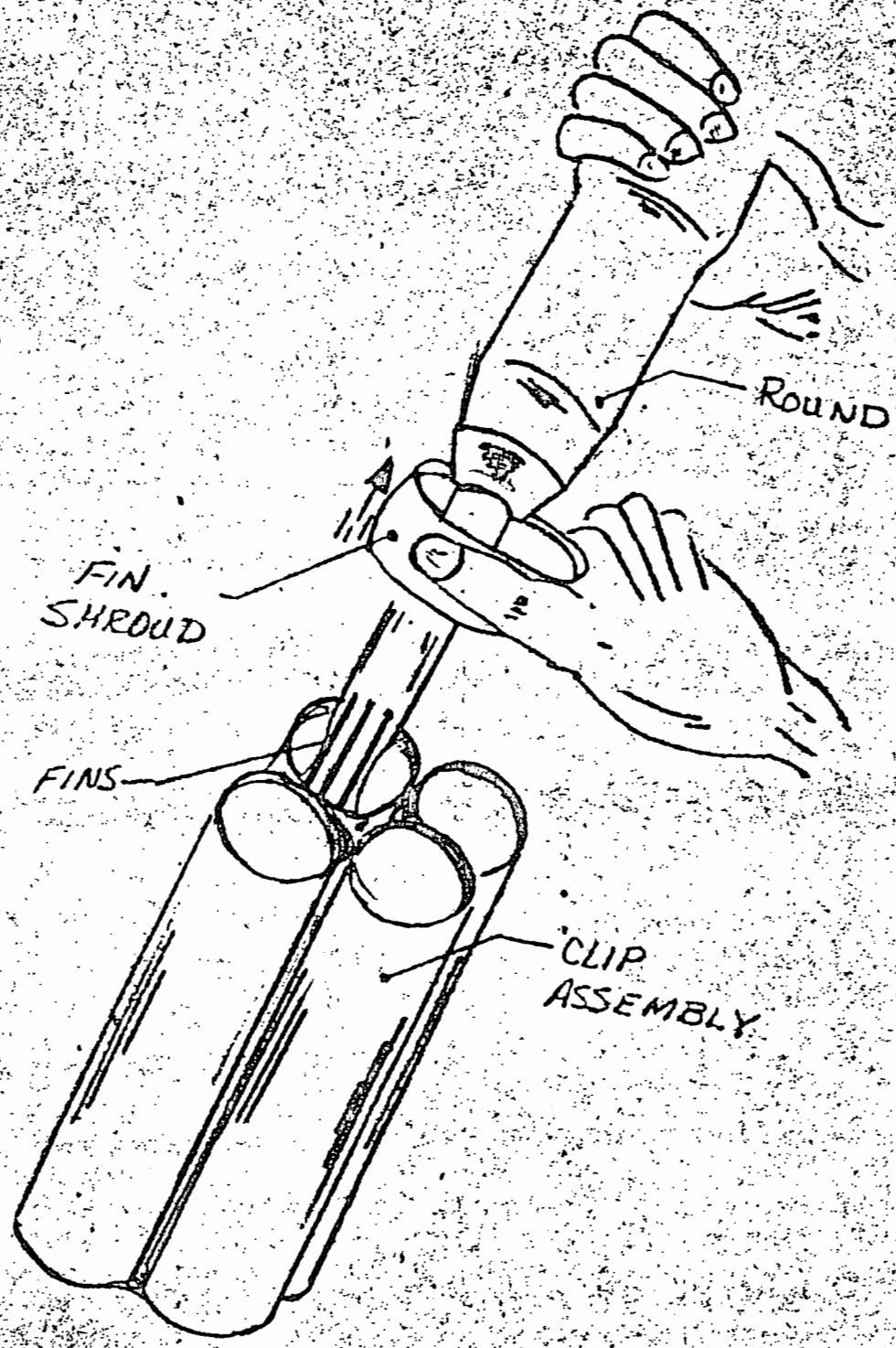


FIGURE II-1. INSERTION OF ROUND IN CLIP ASSEMBLY

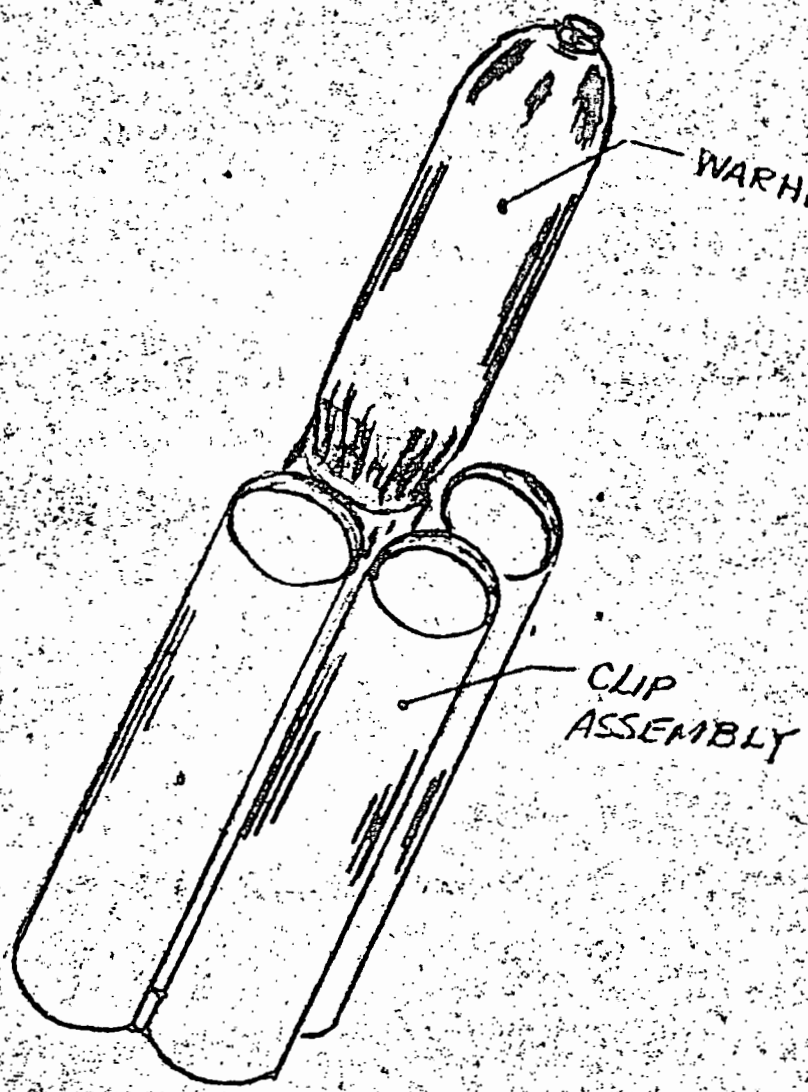


FIGURE II-2 CLIP ASSEMBLY LOADED WITH ONE WARHEAD

STANDARD OPERATING PROCEDURE
MULTISHOT PORTABLE FLAME WEAPON FIELD OPERATION

III. LAUNCHER OPERATION - STATIC TEST STAND

Item No.	Item
1.	Place launcher, without clip, on the mounting support stand, removing the front and rear covers on the launcher with the trigger mechanism in the extended position.
2.	Secure the four bands on the mounting support stand around the launcher. The bolts located on the mounting support bands turn clockwise to tighten. Care must be taken to insure the four bolts are not drawn too tightly such that the launcher fiber glass tubes are deformed.
3.	Insert empty clip in the launcher to insure clip freedom of movement with the tightened bands. If the clip does not insert freely or move with relative ease, release the pressure of the mounting bands by loosening the four bolts. After the clip slides freely in the launcher check the security of the launcher in the mounting stand.
4.	Remove the empty clip from the launcher and insert the bore sight tube in the tube which is to be fired first. The boresight tube should exhibit no play when securely set in the launcher tube.
5.	Align the cross hairs of the boresight tube with the target impact point down range from the launcher by loosening the mounting stand elevation lever for elevation corrections and moving the mounting stand laterally for azimuth corrections.
6.	Upon completion of the final elevation and azimuth corrections lock the elevation level securely in placebyturning in a clockwise direction. Place eight sand bags (50 lb) on the tri-base pod of the mounting stand to insure no shift in azimuth or in the aft direction when the launcher is fired. Give final alignment check using the bore sight tube, then remove same from the launcher tube.
	Position the M-20 sight assembly in the operational mode and adjust such that the vertical line of the reticle disects the impact point and the zero range horizontal reticle marking is level with the impact point. Tighten all adjustment screws on the sight mounting assembly to insure no sight movement in future weapon use.
8.	Determine launcher quadrant elevation angle using a gunner's quadrant. Add the quadrant elevation angle (read in mils) to the gunner's quadrant reading in accordance with the trajectory tables for the flame weapon system. Place the gunner's quadrant on the launcher barrel and adjust launcher elevation until the bubble in the gunner's quadrant is centered in the gage. Secure the quadrant elevation lever firmly in place. Check target alignment with the launcher sight system, by alignment of the proper azimuth and elevation markings with the impact point.

9. Check position of the firing cam so the desired round is launched from the preferred tube. This is accomplished by cocking the mechanism (firing pins) squeezing the trigger until the firing pin is located at the desired tube to be fired. Recock the mechanism and squeeze the trigger four times to clear the launcher.

10. Connect the solenoid trigger trip (aluminum band) to the trigger by inserting a roll pin through the band into the front of the trigger.

11. Check firing box to insure that safety cable (jumper cable) is removed. Portable field generator can be either on or off.

12. Clear the range of all personnel in the immediate vicinity of the launcher and down range at the target.

13. Check all launcher safeties to insure they are on the safe position.

14. Check firing pin order to insure the desired round is launched from the prepared tube.

15. Place the launcher aft firing mechanism in the collapsed position.

16. Release the retaining latch on the loaded clip assembly by sliding the latch outward from the center line of the clip assembly (see figure III - 1.

17. Carry the loaded clip assembly to the launcher by the bail provided on the back of the clip assembly.

18. Stand with your body alongside the back of the launcher and load the clip into the launcher using the left arm as a cradle for the clip-warhead section and pushing the clip assembly with the right hand securely grapsing the clip assembly bail wire handle (see figure III-2)

19. Slide the clip assembly into the launcher until it is in the collapsed position and secure the firing pin mechanism to the clip assembly by sliding the clip retaining latch toward the clip assembly center line (opposite direction from the release mode of operation).

20. Rotate bail handle into collapsed position, such that it is no longer in line with the rocket motor blast and securely fastened to the side of the clip assembly as shown in figure III-2.

21. If launcher is not immediately fired, assure cocking knob located at the rear of the launcher assembly is in the "safe and cock" position.

22. Check trigger handle safety for proper engagement.

23. Insure range is clear of all personnel both at the target and near the vicinity of the launcher.

24. Insure trigger safety is in the safe position.

25. Check target alignment with open sight to insure the launcher has not shifted from its mounting and pointing off target.

26. Cock firing pins by pressing and turning (clockwise) the knurled knob 30 degrees located at the aft end of the launcher. The launcher

(all four firing pins) are considered cocked if it is impossible to see four red indicating rods in the vicinity of the firing pins.

27. Extend the clip assembly its full length.

28. Turn the cocking knob counterclockwise 30 degrees to release the firing pin safety.

29. Inform all personnel on the range the weapon system is ready to be fired.

30. Release the trigger safety to "fire" position.

31. Start portable generator unit.

32. Final warning to all personnel on the range system is ready to be fired.

33. Insert safety cable in fire control box.

34. Commence countdown to fire weapon starting with 5 down to 1, then "fire" by pressing red button on the fire control box.

35. In event one or more rounds do not leave the launcher after the firing circuit have been completed engage the firing button a minimum of four (4) times.

36. In event the round still remains in the launcher after the second firing circuit is completed, remove the safety cable from the firing box and secure the generator.

37. After 3 minutes have elapsed from the last firing sequence, approach the launcher (on the test stand) from its longitudinal mid-point and set the trigger safety to the "safe" position.

38. Set the aft firing pin safety by rotating the knurled knob 30 degrees in the clockwise direction. In performing this task stand at the longitudinal mid-point of the launcher.

39. Release the bail wire handle and collapse the clip assembly in toward the launcher tubes.

40. Release the clip-launcher assembly clasp by sliding the lever away from the launcher.

41. Pull clip assembly and rounds outward with the left hand and provide a cradle for the rounds with the right arm.

42. Carry clip assembly with loaded rounds to a safe area where this assembly can be inspected.

43. Inspect launcher firing mechanism in an effort to determine firing failure.

44. Do not attempt to fire weapon until the nature of the defect has been determined and corrected.

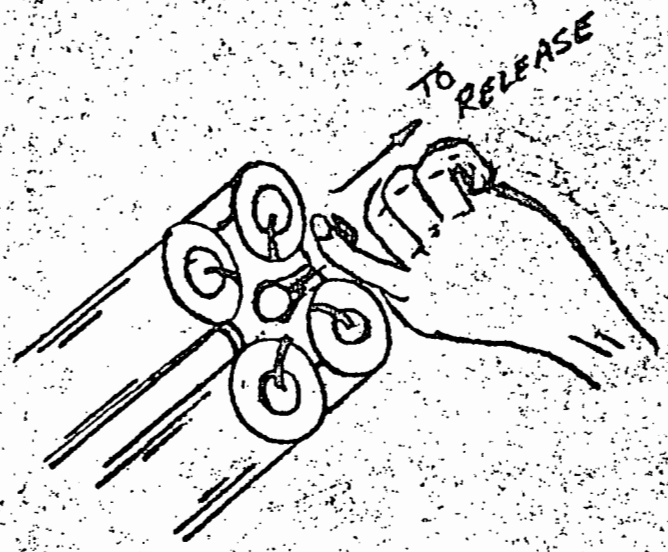


FIGURE III — 1
RELEASING CLIP ASSEMBLY HOLDING CLASP

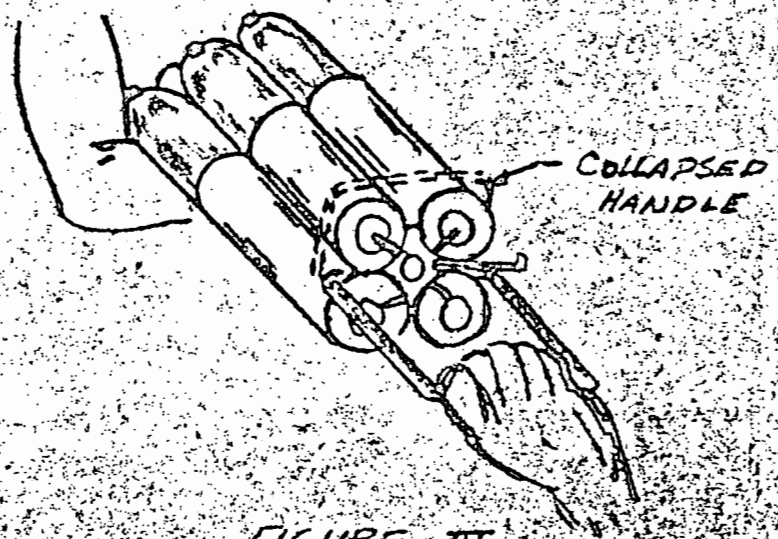


FIGURE III — 2
PREPARATION OF CLIP LOADING

STANDARD OPERATING PROCEDURE
MULTISHOT PORTABLE FLAME WEAPON FIELD OPERATION

IV. LAUNCHER OPERATION - MAN-FIRED.

Safety	Check trigger safety to insure engagement.	
	Check cocking mechanism for indicator and insure on "Safe and Cock."	
	Check range to assure no personnel are present in the firing zone.	
	Check to the rear to assure no obstacles exist.	
Note	The above safety steps are integrated into the following procedure but are listed above to provide a ready means of checking prior to each use of the weapon regardless of its state of operation (full loaded, partially loaded, or operational failure and removal from the shoulder).	
Procedure	Weapon Loading	
1.	Detach the front cover swing down into position and hook in place using the attachment provided.	
2.	Remove the weather seal and release the trigger assembly allowing this assembly to move downwards into position. Inspect to assure the assembly is locked in the down position.	
3.	Check trigger safety to assure its engagement.	
4.	Release the back cover and allow it to rotate beneath the weapon.	
5.	Check the cocking mechanism to assure the device is in the safe position (metal tabs of rotating sleeve should obstruct firing pins by covering firing pin tips).	
6.	Lift weapon up at a slightly higher angle (approx. 45°). Pick up loaded clip assembly and insert into rear end of launcher tubes using ends of warheads as guides. Completely seat clip assembly against launcher and fasten in place by attaching latch assembly to the launcher center shaft in the manner provided.	
7.	Place loaded weapon on folding stand provided until ready for firing.	
NOTE:	Weapon is now fully loaded but has both safeties engaged and is safe to handle, store, or leave resting on the stand.	
	The next steps are concerned with actual operation of the weapon and will constitute the firing cycle, regardless of the number of rounds being tested.	
8.	Check the trigger safety to insure engagement.	
9.	Check the range to assure no personnel are present in the firing zone.	

10. Check to the rear to assure no obstacles exist.

11. Check all personnel to assure instrumentation is ready.

12. Extend the M-20 sight into the firing position. (Sight has been previously set by bore sighting in accordance with Procedure III.

13. Extend the clip using the bail provided until it locks in place. Retract the bail and hook against the outside rear edge of the clip inner tube.

14. Cock the weapon by applying inward pressure to the cocking rod. Check indicators provided to assure all four firing pins are cocked. (Any uncocked firing pin will have a red indicator rod left protruding from the rear face of the clip primer manifold).

15. Turn cocking rod to "arm" position by rotating counterclockwise approximately 30° and pulling rod in an upward direction.

16. Place weapon on shoulder and sight target. Disengage trigger safety.

17. On countdown from "Fire Control" operate weapon by depressing trigger. Each depression of the trigger mechanism will fire a round. (The operator may use ear plugs to reduce the noise effect. The noise level is beneath the ear tolerance level, but above the comfortable level and does produce some "ringing" if ear plugs are not used.)

18. After firing all rounds intended, engage the trigger safety, remove the weapon from the shoulder, position the rear cocking rod in the "Safe and Cocking" position and place the weapon on the stand.

19. If all rounds loaded in the clip have been expended, remove the clip from the launcher by collapsing the weapon, disengaging the rear holding latch and pulling the clip assembly rearward using the bail assembly. The weapon is now ready for reloading of a new clip.

V. HANGFIRE

Item No.	Item
NOTE	The following procedure covers the sequence of operations required of the operator in the event a malfunction occurs during the normal firing sequence and the sequence of events necessary to evaluate and dispose of a warhead malfunction at the target. The safety steps required are integrated into the stepwise procedure presented herein.
1	If a M-56 igniter fails to initiate after activation of the trigger assembly, push the trigger forward with the finger and refire. If the round is expelled, continue to fire until another blank occurs. If the round fails to fire on the second pull, hold the weapon on the shoulder and slowly count to 60. After counting, engage the trigger safety, remove the weapon from the shoulder making sure the weapon remains pointed downrange.
2	Position the cocking rod in the "Safe and Cock" position, disengage the clip retaining latch and remove the clip from the launcher.
3	Transfer the clip and launcher to the holding table for preliminary examination to determine if the failure mode is in the launcher or in the round.
4	If the round fails to function on impact at the target, all personnel should remain clear of the impact point for ten minutes.
5	At the end of the waiting period, one observer should dress in the aluminized clothing provided and approach the failed warhead. On visual inspection of the warhead, it should be ascertained that all fuel burning has extinguished prior to close approach or handling of the item.
6	If burning has not been extinguished, the observer should retreat from the specimen and wait until burning has ceased.
7	Once burning has ceased, the observer should approach the specimum and remove it from the target area. The item should be placed in a safe area, the fuze assembly removed and the specimum allowed to cool for an additional hour. The item is now safe to dispose of.
8	Upon removal, the fuze firing pin should be removed and the fuze examined for possible failure modes. All observations are to be recorded on the Test Data Sheets.

ENGINEERING TEST SUMMARY

FORM NS 1027 (4-67)

ETS NO.	5217-1
T. W. O. NO.	5217
DATE	1-14-69

PROGRESS ☐
FINAL ☐

TO: D. D. Clites

COPIES: H. B. Stormfeltz
File

TITLE OF T. W. O. OR SPECIMEN: 40-MM CS Rounds			
DWG. NO.: SK 37302	MFRS DWG NO.:	MODEL NO.:	SERIAL NO.:
MFR OF SPECIMEN: Nortronics-Anaheim	CITY:	STATE:	
FUNCTION OF PART:			
FOR INSTALLATION IN:			
TYPE OF TEST: Development	START TEST (DATE): 1-13-69	END TEST (DATE): 1-13-69	

TEST ENGINEER: D. K. Belcher	SUPERVISOR: J. W. Hock	COMPREHENSIVE REPORT FOLLOWS	YES / X NO
ORGN.: 6773	ZONE: Y34	EXT: 454	REFERENCES: BPI 9995-3754

OBJECTIVE OF TEST:

To verify fuze functioning of modified E24 CS munition rounds test fired from a M79 grenade launcher.

SPECIMEN(S):

Modified E24 CS munition rounds

DISPOSITION OF SPECIMEN(S):

Recovered and returned to Project for evaluation.

TEST EQUIPMENT AND IDENTIFICATION:

M79 Grenade Launcher
49v Battery and Solenoid
Pathe Motion Picture Camera
B & W Still Camera

ENGINEERING TEST SUMMARY (Continuation Sheet)
FORM ES 1829A (4-67)

DIRECTION OF TEST SETUP(S) & LOCATION:

The tests were performed at the Riverside Remote Site utilizing a tie down mount for the M79 grenade launcher and using a solenoid and a 49 volt battery as a power source to fire the munitions.

Results of the tests were documented by both motion picture and still (black and white) photography.

TESTING PERFORMED AND RESULTS:

Test #1 - Static

Slider set in armed position, Red Visco fuze used to set off first fire. (Delay did not burn.) First fire gassed off and did not light the delay.

Test #2 - Impact

The M79 launcher was set 60 feet from the target. The round moved one-half way down the barrel and stopped. The firing pin came out of its bulkhead on setback.

Test #3 - Static

The round used in Test #1 was reworked and used in this test. Delay was removed from the slider and the IC4 and lead azide in the slider was set off by a Red Visco fuze. The CS burned producing a good cloud.

Test #4 - Impact

The bore-lay was removed and the plastic bulkhead was replaced with an aluminum firing pin bulkhead. The M79 launcher was set 20 feet from the target. The round hit square on its nose. The primer fired, but did not set off the lead azide cup.

Test #5 - High Angle

The M79 launcher was set at approximately 80 degrees. The round did not exit the gun; the firing pin came out of the bulkhead (plastic) on setback. The round came apart in the barrel and the primer fired in the barrel but did not set off the lead azide cup. Note: Bore-lay was removed.

ENGINEERING TEST SUMMARY (Continuation Sheet)
FORM NS 1623A (4-67)

TESTING PERFORMED AND RESULTS, continued

Test #6 - High Angle

The M79 launcher was set at approximately 80 degrees. The tracer ignited, but when the round hit the ground the fuze came out and the tracer stopped burning. The bore-lay was removed. The round did not fly stable. The tracer could be seen from launch to impact.

Test #7 - High Angle

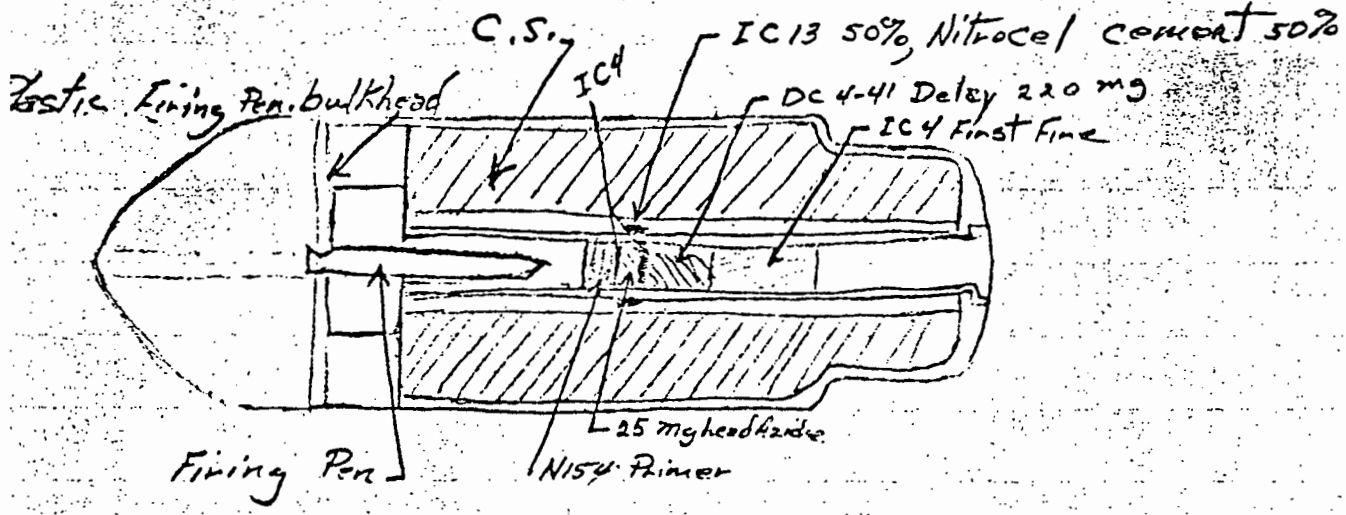
An approximate 80 degree setting was made on the launcher. The tracer ignited and could be seen from launch to impact. After impact the tracer set off the CS, which made a good cloud. The bore-lay had been removed. The round did fly stable.

Tests 1 through 5 were performed to concept #1, SK 37302, attached.
Tests 6 and 7 were performed to concept #2, SK 37303, attached.

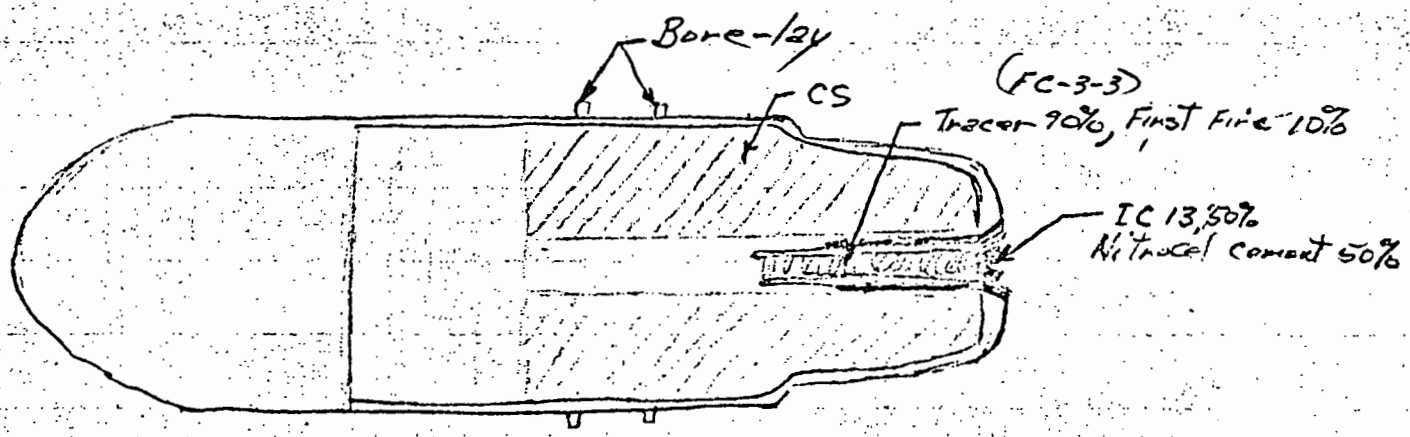
M9 charge was reduced to 245 mg to obtain low velocity impact on all tests.

1-13-69
40 mm mk CS

#1 SK 37302



#2 SK 37303



1.0 GENERAL

1.1 All firing tests will be accomplished in accordance with an approved Test Work Order (TWO).

1.2 The Test Engineer is responsible for the safety of all personnel in the test area, and shall coordinate the test activities as required to assure all necessary approvals have been obtained prior to starting the test.

1.3 The Test Engineer shall insure that all personnel involved in the test are familiar with the following:

1.3.1 The nature and characteristics of the test.

1.3.2 The safety features of the equipment and facilities.

1.3.3 Proper operating procedures.

1.3.4 Fire and emergency procedures.

1.4 All electrically initiated tests will include a complete circuit check prior to loading.

2.0 EQUIPMENT REQUIRED

2.1 Special

2.1.1 First Aid Kit

2.1.2 Fire Fighting Equipment

2.1.3 Portable Warning Device

2.2 Personal Protective Equipment

2.2.1 All personnel in the test area shall wear safety glasses and hard hats at all times.

3.0 PROCEDURE

3.1 Hand Held Weapons (Rifles, Pistols, Grenade Launchers-stab or percussion Initiated)

SAFETY: All first firings (single and multiple fire) of hand held weapons systems shall be remote controlled with all personnel protected by distance or barricades.

3.1.1 Single Round Firing

3.1.1.1 Keep Weapon Cleared. Weapon will be cleared and on safety at all times previous to test.

3.1.1.2 Clear Area. All area forward of the muzzle of the weapon will be cleared of personnel.

3.1.1.3 Alert All Personnel. All personnel in the area will be alerted just before the test as to the time of the test and the danger area. Use portable warning device as posted.

3.1.1.4 Load Weapon. When all test personnel are in position, the firer will pick up and load the weapon, keeping the muzzle pointed in the direction of the target.

3.1.1.5 Fire Weapon. The firer will then aim and fire the weapon.

3.1.1.6 Clear Weapon. Immediately after firing and before anyone moves in front of the muzzle, the weapon will be cleared and put on safety.

3.1.1.7 Misfire. In the case of a misfire, the firer will notify all test personnel of the misfire; the weapon will be laid down and aimed toward the target for 5 minutes, after which the round will be checked. If the primer has not been struck, the weapon will be checked for defects; if the primer has been struck, the round will be given to Ordnance Magazine Control personnel for disposal.

3.1.1.8 Give All Clear. After the test has been completed, all personnel in the area will be given the all clear signal. Use portable warning device as posted.

3.1.2 Multiple Fire (Repeater, Automatic, Semi-Automatic)

3.1.2.1 Conduct Single Fire. (See 3.1.1.1 through 3.1.1.8)

3.1.2.2 Conduct Multiple Fire. (See 3.1.1.1 through 3.1.1.8)

3.2 Fixture Mounted Weapons

3.2.1 Lanyard Initiated (Rifles, Pistols, Grenade Launchers-stab or percussion)

3.2.1.1 Keep Weapon Cleared. Weapon will be cleared and on safety at all times previous to test.

3.2.1.2 Clear Area. All area forward of the muzzle of the weapon will be cleared of personnel.

3.2.1.3 Alert All Personnel. All personnel in the area will be alerted just before the test as to the time of the test and the danger area. Use portable warning device as posted.

3.2.1.4 Load Weapon. When all test personnel are in position, load the weapon and check to see that lanyard is in position.

3.2.1.5 Fire Weapon. From a position to the rear of the weapon, the firer will fire the weapon by pulling on the lanyard.

3.2.1.6 Clear Weapon. Immediately after firing and before anyone moves in front of the muzzle, the weapon will be cleared and put on safety.

3.2.1.7 Misfire. In the case of a misfire, all personnel will be notified immediately. The weapon will not be approached for 5 minutes, after which it will be unloaded. The round will be checked and if found defective will be handed over to Ordnance Magazine Control personnel for disposal.

3.2.1.8 Give All Clear. After the test has been completed, all personnel in the area will be given the all clear signal. Use portable warning device as posted.

3.2.2 Electrically Initiated (Rifles, Pistols, Rockets, Large Caliber Guns, Special Devices)

3.2.2.1 Keep Weapon Safe. Weapon will be unloaded or disarmed and firing circuit will be shorted or disconnected at all times previous to test.

3.2.2.2 Clear Area. All area forward of the weapon or a rear backblast area will be cleared of personnel.

3.2.2.3 Alert Personnel. All personnel in the area will be alerted just before the test as to the time of the test and the danger area. Use portable warning device as posted.

3.2.2.4 Check Firing Circuit. Immediately before the weapon is approached for final arming or loading, the firing

lines will be shorted at the control end.

3.2.2.5 Load or Arm Weapon. When all test personnel are in position, the weapon will be loaded or armed.

3.2.2.6 Connect Firing Lines. After the technician has returned to the control area, the firing lines will be unshorted and connected into the initiating circuit. (Squib check as required.) Use portable warning device as posted.

3.2.2.7 Count Down and Initiate. A final count down will be given for all personnel to hear for instrument coordination and the weapon will be initiated. Use portable warning device as posted.

3.2.2.8 Make Circuits and Weapon Safe. Immediately after initiation, the firing lines will be disconnected and shorted at the control end. The weapon will then be disconnected.

3.2.2.9 Misfire. All personnel will be alerted at once. There will be a 10 minute delay before any action is taken. The initiating circuit will be checked after the firing lines are disconnected and shorted. (If corrective action can be taken at the site, the test will resume.) If all is found to be correct, a second count down and initiation will proceed. If a misfire again occurs, the firing lines will be approached and disarmed or unloaded.

3.2.2.10 Give All Clear. After the test has been completed, all personnel in the area will be given the all clear signal. Use portable warning device as posted.

Prepared by:

J W Hock

J. W. Hock, Supervisor
Ordnance Test Unit, Y6772

Approved by:

A L Van Der Most

A. L. Van Der Most
Safety Administrator

Approved by:

J. T. Laurie

J. T. Laurie, Chief
Mechanical Equipment & Support Group

B. Karin

B. Karin, Director
Ordnance Systems Section

NORTHROP NORTRONICS

STANDARD PRACTICE PROCEDURE

(California Departments)

SUBJECT: EXPLOSIVES - HANDLING AND CONTROL

S.P.P. NO.	10-2
PAGE	1 OF 5
EFFECTIVE DATE	18 October 1965
SUPERSEDES	

I. GENERAL

A. Only authorized personnel throughly trained in applicable methods and regulations shall handle explosives. In all explosives operations the minimum number of personnel will be exposed to or allowed in the vicinity of explosives. During handling operations the area will be cleared and/or monitored as specified by applicable safety regulations. The Ordnance Laboratory has primary cognizance for control of explosives.

B. Explosive received as Government Furnished Property (GFP) or Customer Furnished Material (CFM) will, in addition to this procedure, be governed by established GFM and CFM procedures.

C. Classified explosives will, in addition to this procedure, be governed by Security Procedure No. 15, "Classified Hardware."

D. Once each month, or on call, a surveillance team consisting of one member from Employee Relations (Safety), Ordnance Systems, Industrial Engineering, and Quality Assurance organizations will examine all areas which test, assemble, and/or store explosives to insure that the areas are operated in compliance with Federal, State, Local and Company safety regulations. (Safety will establish the date each month and notify other members of the team.) The responsible supervisor or foreman will accompany the team during inspection of his area.

II. DEFINITION

A. For the purpose of this procedure, explosives are all explosive, propellant, and pyrotechnic materials which require special handling and control in accordance with Federal, State, Local and Company regulations.

III. PROCEDURE

A. Employee Relations (Safety)

1. Interprets Federal, State and Local explosive safety regulations and prepares and publishes appropriate safety instructions.

2. Approves specifications for, and use of, containers, protective and emergency equipment, and trucks and facilities for the handling, transport and storage of explosive materials.

3. Advises Corporate Insurance Administration when changes are made in the class of storage or use of explosive materials to assure proper insurance coverage.

III. PROCEDURE

A. Employee Relations (Safety) (Continued)

4. Performs safety surveillance over explosives handling operations, good housekeeping practices, and protective and emergency equipment and facilities.

B. Industrial Engineering in coordination with Safety, assures that explosive storage magazines and testing and assembly areas meet requirements of State, Local and Company regulations and are equipped with necessary emergency equipment.

C. Ordnance Systems/Technical/Product Development Support

1. Indicates the Interstate Commerce Commission (ICC) and Federal Explosives Storage Compatibility class and net weight of explosive charges on all drawings, Engineering Orders (EOs), Advanced Material Requests (AMRs), or other requisitions pertaining to the procurement of explosives.

2. Submits to the Ordnance Laboratory for approval prior to release, all drawings, EOs, AMRs, or other requisitions pertaining to procurement of explosives in order to insure that quantities and weights are within the allowable limitations of the storage magazines and that compatibility requirements are met.

D. Materiel

1. Indicates the ICC and Federal Explosives Storage Compatibility class and net weight of explosive charges on procurement documents. Requests the supplier repeat this information on his packing sheet so that this information is immediately apparent to personnel receiving the shipment.

2. Specifies on procurement documents that Nortronics will accept shipment of explosives only between the hours of 8:00 a.m. to 11:00 a.m. and 12:30 p.m. to 3:30 p.m. on Mondays through Fridays, except holidays, unless special arrangements are made in advance. Requests the supplier indicate on the bill of lading: "Please Contact Northrop Nortronics Traffic Manager Before Effecting Delivery."

E. Security (Main Gate)

1. Notifies Receiving (Traffic Manager) upon arrival of shipment of explosives.

2. Admits shipment of explosives to Company property only between the hours of 8:00 a.m. to 11:00 a.m. and 12:30 p.m. to 3:30 p.m. on Mondays through Fridays, excluding holidays, unless special arrangements have been made in advance.

III. PROCEDURE (Continued)

F. Receiving

1. Notifies the Ordnance Laboratory upon arrival of shipment of explosives.

2. Accompanies the carrier to the ordnance magazine and assists in unloading of explosives under the supervision of Ordnance Laboratory personnel.

3. Signs the carriers freight bill and obtains signature of Ordnance Laboratory personnel on the suppliers packing sheet.

4. Forwards suppliers packing sheet to the Receiving Office for processing in accordance with applicable Materiel Procedures.

G. Ordnance Laboratory

1. Upon arrival of shipment of explosives, notifies Safety, Quality Assurance (Receiving Inspection) and the organization originating the requirement (as determined from a copy of the purchase order).

2. Supervises handling of explosives with two persons present whenever explosives are handled.

a. Assures that explosives stored in magazines are of compatible storage classes.

b. Assures that explosives are stacked at least (4) inches from all walls.

c. Assures that no package or individual explosives container is opened within a magazine.

3. Controls maximum quantity of explosives in the magazine so that the allowable limit is not exceeded.

H. Quality Assurance

1. When notified that explosives have been received, inspects the items to classify them, determines their physical condition, and completes required inspection records.

2. Notifies the cognizant Government Quality Assurance Representative of receipt of explosives as applicable.

3. Monitors and inspects production assembly of explosives.

I. Ordnance Laboratory

1. Maintains a perpetual inventory (daily balance on hand) of each explosive stored in the magazine. Also maintains current Ordnance Laboratory procedures, safety instructions, government regulations, and required inspection records pertaining to explosives.

III. PROCEDURE

I. Ordnance Laboratory (Continued)

NOTE: Inventory records are to be maintained in an explosive-safe room or separate building.

2. Issues explosives per Ordnance Laboratory procedures only to authorized personnel who have been properly identified.

3. Assures that visitors to the magazine are rigidly controlled. Permits only personnel having authorized business to enter. Prior to entry, all fire and spark producing possessions will be surrendered and placed outside the magazine or laboratory.

J. Using, Testing, or Assembly Organization

1. In coordination with Safety and Quality Assurance, develops internal operating procedures for safeguarding and handling of specific explosives on each individual program.

2. Assures that explosives are properly marked, tagged or otherwise clearly identified at all times.

3. Assures that explosives are handled only by trained and qualified personnel and that the minimum number of personnel are exposed to or allowed in the vicinity of explosives.

4. Assures that explosives are protected at all times from such conditions as moisture, electric charges, sparks, fire excessive heat and the direct rays of the sun.

5. Assures that tools used on or around explosives are of the non-sparking type.

6. Handles exposed explosives by hand or on non-sparking conveyors.

7. Daily, returns all unexpended, defective, condemned, and suspended explosives to the Ordnance Laboratory or to an approved holding magazine.

NOTE: Explosives will not be loaned or given to another organization unless they are first processed through the Ordnance Laboratory.

8. As applicable, packages and wraps explosives for shipment and signs and attaches explosive labels in accordance with Federal, State, Local and Company specifications.

9. Forwards Production Order or prepares and submits Request for Shipping Action, Form 31-47, to Shipping as applicable.

III. PROCEDURE (Continued)

K. Shipping and Container Engineering

1. Furnishes packaging information forms and drawings for any special containers required for explosive.

2. Furnishes materials for wrapping and packaging explosives.

3. Upon determining from a sales order that explosives are to be shipped, prepares Part Packaging Authority, Form NSS 4, and sends copies to affected organizations.

4. Upon receipt of copy of Production Order or Request for Shipping Action, prepare appropriate shipping document and distributes copies.

L. Traffic and Transportation

1. Upon receipt of shipping document, prepares bill of lading, express receipt, or air bill and arranges for pick-up and transportation from the Ordnance Laboratory by a properly licensed carrier.

2. Verifies that all incoming and out-going vehicles carrying explosives are marked, flagged or placarded in accordance with Federal, State and Local regulations.

M. Ordnance Laboratory

1. In coordination with Safety, establishes necessary disposal procedures.

2. Takes necessary action to dispose of condemned or rejected explosives within a reasonable time and in compliance with Federal, State, and Local ordinances.

3. Assures that final disposal documents are prepared and filed.

ISSUED BY:

SYSTEMS AND PROCEDURES

NORTHROP
Northrop Corporation Electro-Mechanical Division

Memorandum

To: Distribution

In reply refer to: 6741-1-80/REW:la

From: R. E. Wheeler

Date: 16 March 1971

Subject: TEST WORK ORDER SIGN OFF

Ref:

Copies: G. Austerman, A. Baker, D. Belcher
J. Hock, T. Kew, D. Mott, V. Peak, J. Reed
file

A review of recent TWO's shows that there is considerable inconsistancies in sign off practices. In the future the following signatures shall be required on each TWO, with additional signatures at the discretion of the originating project engineer:

1. Project Engineer
2. Jim Hock (alternate R. Wheeler)
3. R. Wheeler
4. Del Mott (alternate D. Belcher)

Alternates may be used when the principal is not in the plant. The signature of Del Mott is intended to satisfy safety requirements and to allow for planning explosive useage.

R. E. Wheeler

R. E. Wheeler, Manager
Product Engineering
Y6741, Ext. 666

STANDARD PRACTICE PROCEDURE

SUBJECT: EXPLOSIVES - TRANSPORTATION VIA COMPANY OPERATED VEHICLES

Maintenance Revision

I. PURPOSE AND SUMMARY

To establish a procedure assigning the responsibility and describing the methods for safe handling and transporting of explosives on company operated vehicles.

II. GENERAL

A. No Department of Transportation (DOT) Class A or B Explosives or Ammunition will be shipped or received at the Northrop Anaheim Plants.

B. Division 14, Transportation of Explosives, State of California Vehicle Code and the Health and Safety Code sets forth specific requirements for the transportation of explosives over public roads.

C. Northrop controlled explosives or ammunition will not be transported in a private vehicle.

III. DEFINITION

Explosive as referenced in this procedure includes all DOT classes of explosives.

IV. PROCEDURE

A. Ordnance Laboratory

1. Handles and transports explosives via company operated vehicles in accordance with the State Vehicle Code, Health and Safety Code, and Company procedures.

2. Coordinates with the Safety Office and establishes the appropriate classification of explosives for packaging and transportation purposes in accordance with DOT regulations.

3. Assures that all drivers:

   a. Meet the medical requirements prescribed by DOT and are re-examined annually.

   b. Do not transport explosives unless shipment is accompanied by a shipping document, showing the kind of explosives and bearing a statement that they have been packaged, labeled and marked in accordance with existing regulations. Said shipping document must be carried in the vehicle while enroute and shall be displayed, upon demand, to law enforcement agencies.

IV. PROCEDURE (Continued)

A. 3. c. Do not transport mixed classes of explosives which are incompatible per existing regulations.

d. Carry a handbook while operating company vehicles showing routes, approved stop-over areas, and emergency procedures for the items being transported.

4. Notifies either Manager of Security and Plant Protection or Manager of Plant Protection prior to the movement of explosives by Company vehicle.

5. Accomplishes vehicle and explosive inspections on all shipments into and out of Northrop facilities using Form DD 626, Record of Inspection, and Government Form DD 836. A record of the inspection will be made at the time of inspection and a permanent file maintained.

6. Establishes and maintains lists of individuals authorized to sign for truck inspection and forwards copies to Safety and Security.

7. Establishes and maintains lists of individuals authorized to sign for explosive inspection and forwards copies to Safety and Security.

8. Publishes and maintains a handbook showing approved stop-over areas, emergency procedures, and related information governing the movement of explosives over public roads.

9. Surrender vehicles to Transportation every other week for proper maintenance except that prior to a trip of 100 miles or more the vehicle shall be inspected and serviced as required.

B. Warehousing Operations

1. Maintains optimum standards of maintenance on all vehicles designated to transport explosive materials.

2. Assures conformance of all equipment with prescribed rules and regulations designated by Safety Administration and local/state enforcement agencies. Conformance will include but not be limited to requirements of the State Vehicle Code.

3. Obtains all permits, approved stop-over areas information, and other related information governing the movement of explosives over public roads. Forwards stop-over and related information to the Ordnance Laboratory.

IV. PROCEDURE (Continued)

C. Safety Office

1. Maintains administrative liaison with municipal, state and federal agencies authorized to initiate, regulate and/or enforce rules and regulations pertaining to the movement of explosives via private carriage.

2. Interprets rules/regulations pertaining to the movement of explosives via private carriage as prescribed by municipal, state and federal regulating agencies.

3. Monitors and recommends the necessary steps to ensure proper and safe handling of explosives to be transported via company operated equipment.

D. Security (Plant Protection)

1. Advise Safety Office and Ordnance Laboratory of the arrival of any vehicles at any Anaheim plant marked with DOT Explosives A and B and awaits re-routing instructions.

2. Immediately advises Safety Officer and Ordnance Laboratory representative of any reported traffic incident involving any company vehicle transporting explosives.

ISSUED BY:

MANAGEMENT SYSTEMS

TEST REPORTS FOR VALUE ENGINEERED FUZE COMPONENTS

VECP 98453-0022-7 FUZE BODY
VECP 98453-0022-8 FIRING PIN

T. J. Kew
15 December 1971

ENGINEERING TEST SUMMARY

FORM NS 1829 (4-67)

ETS NO.	300679-1
T. W. O. NO.	300679
DATE	12/15/71

PROGRESS [ ]
FINAL [X]

TO: T. J. Kew (4 copies)

COPIES: D. Belcher, file

TITLE OF T. W. O. OR SPECIMEN: Evaluation Test for Value Engineered Fuze Body and Firing Pin

DWG. NO.	MFRS DWG NO.	MODEL NO.	SERIAL NO.

MFR OF SPECIMEN	CITY	STATE
Northrop E.M.D.	Anaheim	Calif.

FUNCTION OF PART:

FOR INSTALLATION IN:

TYPE OF TEST	START TEST (DATE)	END TEST (DATE)
Jolt Test	11-23-71	11-24-71

TEST ENGINEER	SUPERVISOR	COMPREHENSIVE REPORT FOLLOWS	YES	NO
D. Belcher	R. Wheeler			X

ORGN.	ZONE	EXT	REFERENCES:
			MIL-F-50541 TWO 300679, S.O. 1938-5107, S.O. 1938-5108

OBJECTIVE OF TEST:

To prove that Fuze Assemblies containing value engineered Fuze Bodies and Firing Pins will meet the Jolt Test requirements when tested in accordance with MIL-F-50541, para. 4.3.3.10.1

NOTE: VECP 1938-5107 proposes making the Fuze Body from 7075-T651 aluminum and VECP 1938-5108 proposes making the Firing Pin from the same material.

SPECIMEN(S):

A sample of 24 Fuze Assemblies were tested. The test Fuze Assemblies were identified as "Jolt 1" thru "Jolt 24".

DISPOSITION OF SPECIMEN(S):

Returned to T. Kew

TEST EQUIPMENT AND IDENTIFICATION: (Northrop Jolt Machine NC-56906 at Riverside Facility) See attached photo.

(1) Jolt Test Machine in accordance with MIL-STD-331A
(2) Six government approved fixtures for enclosing Fuze Assemblies.
(3) Six adapter plates for adapting the fixtures to the jolt testing machine.
(4) Dial Torque Wrench (Northrop No. 6129) and Torque Wrench Adapter.

Direction of Test Setup(s) & Location:

(1) Testing was performed at the Northrop Riverside Facility under the direction of Ordnance Lab Personnel.

(2) Using socket head cap screws, the aluminum adapter plates were attached to the three mounting surfaces of two arms of the Jolt Machine.

(3) Test Fuze Assemblies were placed in the fixtures in accordance with MIL-F-50541, para. 4.4.6.

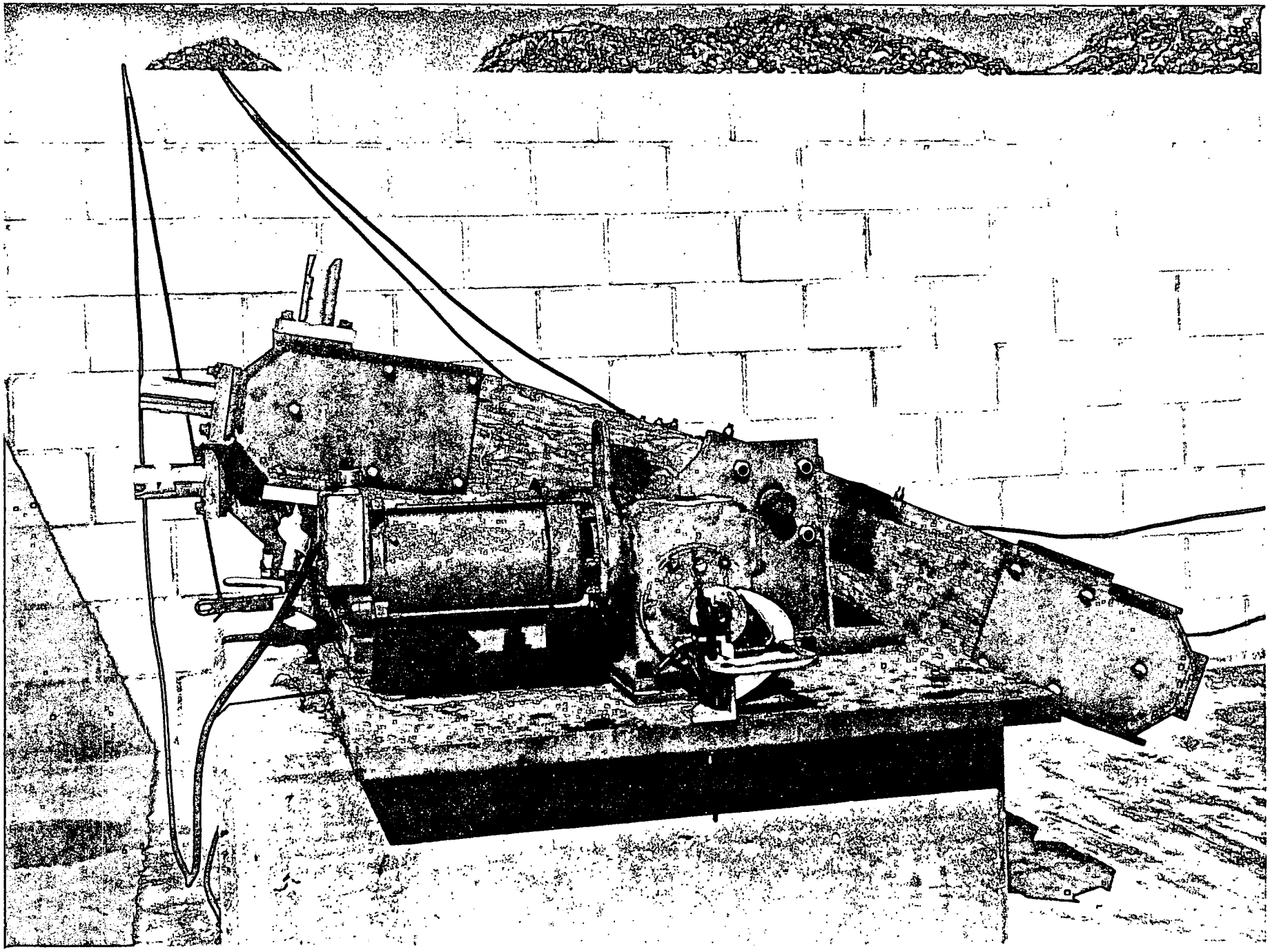
(4) The fixtures containing the Fuze Assemblies were moved from one position to another such that each Fuze Assembly was jolted 1750 times in each of the three orientations. (Blue Goop* was applied to the threads of the fixtures to prevent seizing).

Testing Performed and Results:

(1) Jolt Tests were performed on the 24 Fuze Assemblies

(2) At the completion of each orientation position and at the conclusion of the Jolt Test, the Fuze Assemblies were examined to see if the pin in the S & A mechanism was in a safe position. All examinations showed that the pin was in a safe position. Therefore, it was concluded that the tested Fuze Assemblies were safe to handle, transport or store and had successfully passed the Jolt Test.

* Blue Goop is made by Crawford Fitting Company, 884 E. 140th Street, Cleveland 10, Ohio



Jolt Test Machine Adapted for Testing Value Engineered Fuze Body and Firing Pin

ENGINEERING TEST SUMMARY

FORM NS 1829 (4-67)

ETS NO.	300679-2
T. W. O. NO.	300679
DATE	12/15/71

PROGRESS [ ]
FINAL [X]

TO: T. J. Kew (5 copies)

COPIES: D. Belcher, file

TITLE OF T. W. O. OR SPECIMEN: Evaluation Test for Value Engineered Fuze Body and Firing Pin

DWG. NO.	MFRS DWG NO.	MODEL NO.	SERIAL NO.

MFR OF SPECIMEN	CITY	STATE
Northrop E.M.D.	Anaheim	Calif.

FUNCTION OF PART:

FOR INSTALLATION IN:

TYPE OF TEST	START TEST (DATE)	END TEST (DATE)
	11-23-71	11-26-71

TEST ENGINEER	SUPERVISOR	COMPREHENSIVE REPORT FOLLOWS	YES	NO
D. Belcher	R. Wheeler			X

ORGN.	ZONE	EXT	REFERENCES:
			MIL-F-50541 TWO 300679, S.O. 1938-5107, S.O. 1938-5108

OBJECTIVE OF TEST:

To prove that Fuze Assemblies containing value engineered Fuze Bodies and Firing Pins will meet the Jumble Test requirements when tested in accordance with MIL-F-50541, para. 4.3.3.10.2.

NOTE: VECP 1938-5107 proposes making the Fuze Body from 7075-T651 aluminum and VECP 1938-5108 proposes making the Firing Pin from the same material.

SPECIMEN(S):

A sample of 24 Fuze Assemblies, identified as "Jum 1" thru "Jum 24", were tested.

DISPOSITION OF SPECIMEN(S):

Return to T. Kew

TEST EQUIPMENT AND IDENTIFICATION:

(1) Jumble Test Machine in accordance with MIL-STD-331. (Northrop Jumble Machine NC-56906 at Riverside Facility). See attached photos.

(2) Two government approved fixtures for enclosing Fuze Assemblies.

Direction of Test Setup(s) & Location:

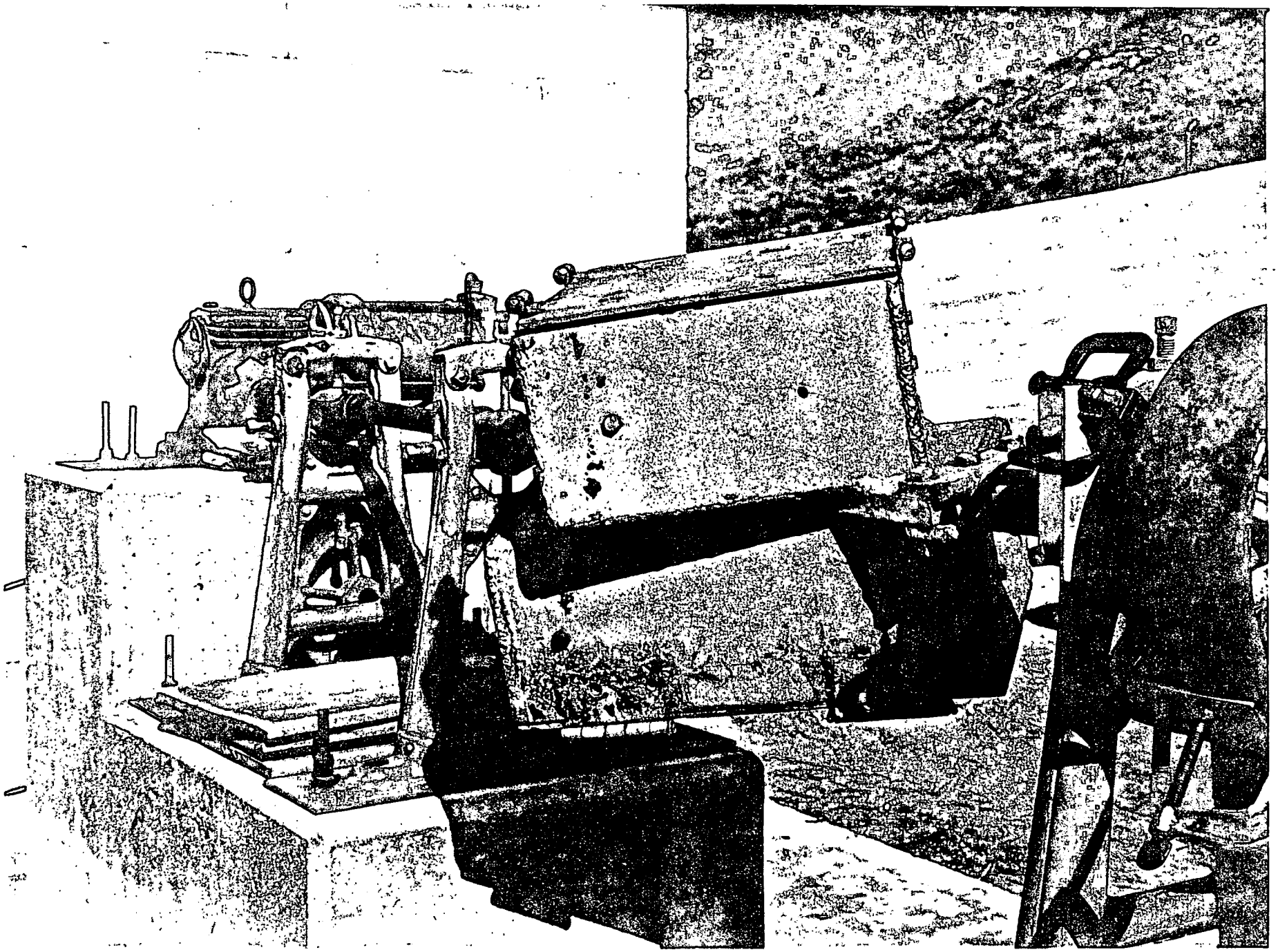
(1) Testing was performed at the Northrop Riverside Facility under the direction of Ordnance Lab Personnel.

(2) Test Fuze Assemblies were placed in the Government approved fixtures in accordance with MIL-F-50541, para. 4.4.7. Strips of plastic treated cloth tape were applied to the covers of the Government approved fixtures to assure that the covers did not jar loose during the test.

Testing Performed and Results:

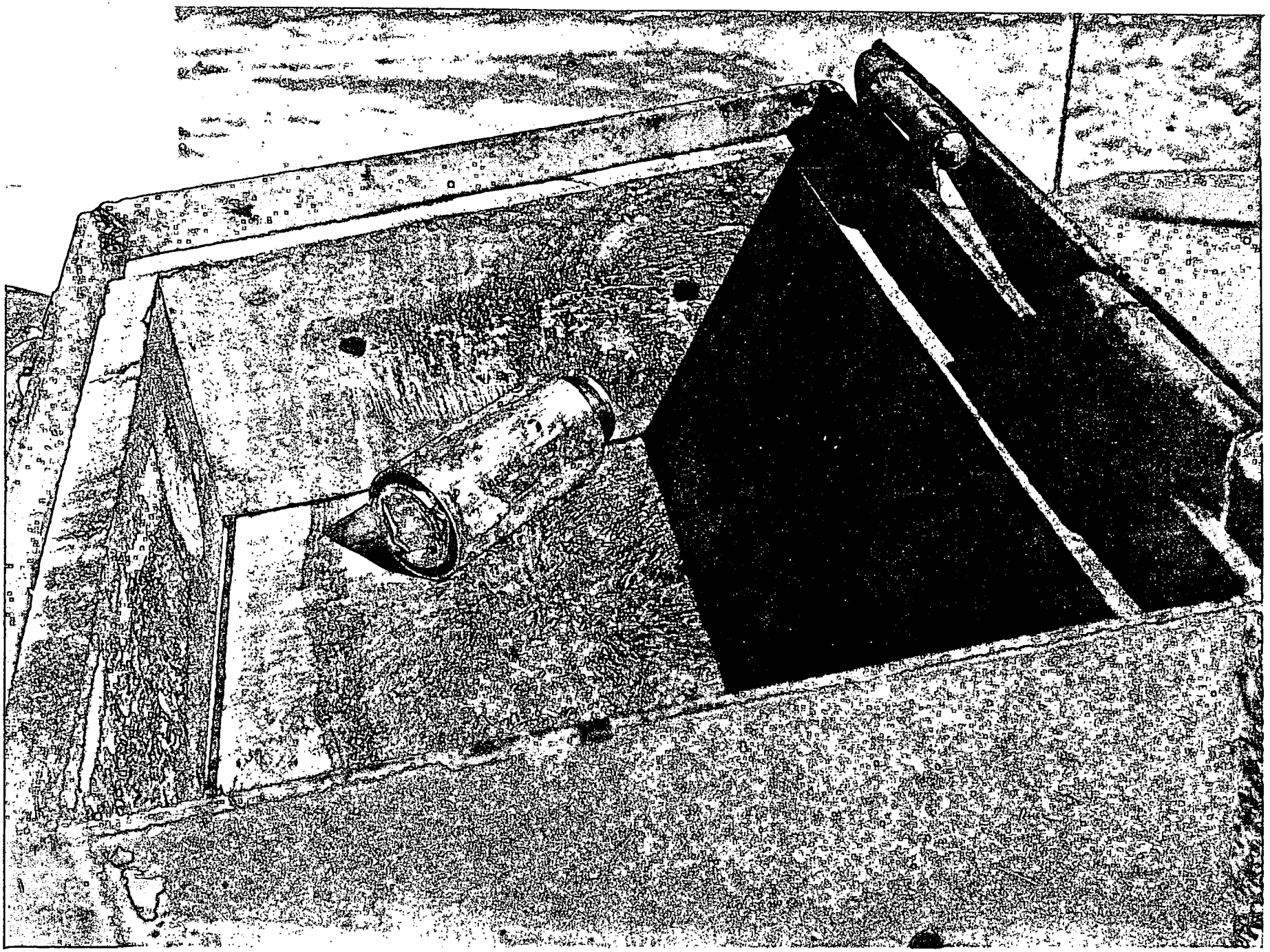
(1) Jumble Tests were performed on the 24 Fuze Assemblies.

(2) At the conclusion of the tests, examination showed that the rotor of the S & A mechanism was in a safe position. It was noted that the pin had come out of rotor in three of the S & A's but rotor had remained in a safe position. Therefore, it was concluded that the tested Fuze Assemblies had successfully passed the Jumble Test.



Jumble Test Machine with Size "A" Jumble Test Boxes

ETS NO. 300679-:



Jumble Test Box Opened to Show Fixture Which Contains Test Fuze Assembly

ENGINEERING TEST SUMMARY

FORM NS 1829 (4-67)

ETS NO.	300679-3
T. W. O. NO.	300679
DATE	12/15/71

PROGRESS [ ]
FINAL [X]

TO: T. J. Kew

COPIES: D. Belcher, file

TITLE OF T. W. O. OR SPECIMEN: Evaluation Test for Value Engineered Fuze Body and Firing Pin

DWG. NO.	MFRS DWG NO.	MODEL NO.	SERIAL NO.

MFR OF SPECIMEN	CITY	STATE
Northrop E.M.D.	Anaheim	Calif.

FUNCTION OF PART:

FOR INSTALLATION IN:

TYPE OF TEST	START TEST (DATE)	END TEST (DATE)
Forty-Foot Drop Test	12-1-71	12-1-71

TEST ENGINEER	SUPERVISOR	COMPREHENSIVE REPORT FOLLOWS	YES	NO
D. Belcher	R. Wheeler			X

ORGN.	ZONE	EXT	REFERENCES:
			MIL-F-50541, TWO 300679, S.O. 1938-5107, S.O. 1938-5108

OBJECTIVE OF TEST:

To prove that Fuze Assemblies containing value engineered Fuze Bodies and Firing Pins will meet the Forty-Foot Drop Test requirements when tested in accordance with MIL-F-50541, para. 4.3.3.10.3.

NOTE: VECP 1938-5107 proposes making the Fuze Body from 7075-T651 aluminum and VECP 1938-5108 proposes making the Firing Pin from the same material.

SPECIMEN(S):

A sample of 16 Fuze Assemblies were tested. The Fuze Assemblies were assembled into warheads and packaged, packed, and dropped in accordance with MIL-F-50541, para. 4.4.8.

DISPOSITION OF SPECIMEN(S):

Return to T. Kew

TEST EQUIPMENT AND IDENTIFICATION:

Tests were performed by vendor. See attached Ogden Technology Laboratory Report F-71663, dated 3 December 1971.

Direction of Test Setup(s) & Location:

See attached Ogden Technology Laboratory Report F-71663, dated 3 December 1971.

Testing Performed and Results:

After being subjected to the Forty-Foot Drop Test, one of the packed boxes was opened. A warhead from the bottom layer and a warhead from the top layer were cut apart and the Fuze Assemblies removed. In both instances, it was found that the pin in the S & A mechanism was in a safe position. (See attached photo).

Therefore, it was concluded that the tested Fuze Assemblies had passed the Forty-Foot Drop Test.

OGDEN TECHNOLOGY LABORATORIES, INC.
Subsidiary of Ogden Corporation

1536 E. VALENCIA DRIVE, FULLERTON, CALIFORNIA 92631
TELEPHONE: 714/879-6110

3 December 1971

FULLERTON DIVISION REPORT NUMBER F-71663
Northrop Corporation P.O. No. E100-68308

A. TEST: 40 Foot Drop

B. TEST ITEMS: Four (4) Boxes, Each Loaded with Four (4) Warheads per DWG. 67D9700 and Packed per DWG. 66B10122.

C. SPECIFICATIONS:
1. MIL-F-50541 (MU), Paragraph 4.4.8.
2. MIL-STD-331, Test 103, Base Down Only.

D. RESULTS: This is to certify that the test items were subjected to the 40 Foot Drop Test according to the above specifications.

There was no indication that any of the packed items fired. The boxes were only slightly damaged.

The test items were returned to Northrop Corporation for final evaluation.

OGDEN TECHNOLOGY LABORATORIES, INC.

D. J. Valenzuela for
R. D. Short, Division Manager

Berry F. Moore
Berry F. Moore, Project Engineer

Subscribed and sworn to before me this 7th day of December 1971.

Ruth A. Vandergrift
Ruth A. Vandergrift, Notary Public in and for the County of Los Angeles, State of California. My commission expires Feb. 3, 1971.

OFFICIAL SEAL
RUTH A. VANDERGRIFT
NOTARY PUBLIC CALIFORNIA
LOS ANGELES COUNTY
My Commission Expires Feb. 3, 1973

R. J. McKelligott
R. J. McKelligott
Quality Assurance Manager

OGDEN QA-2

las

ETS NO. 300679-3

DATE STARTED: 12-1-71	PARTS TEST DATA	TEST ENGINEER: Berry F. Moore
DATE COMPLETED: 12-1-71	SPECIMEN DESCRIPTION: Four Test Items Boxes Loaded with 4 Warheads each. = =	P/N (66B10122)(67D9700)
TEMP: Amb.	TEST: 40 FOOT DROP	SPECIFICATION: MIL-STD 302 or 331 AND MODIFIED BY: MIL-F-50541 Para. 4.4.8.
HUMIDITY: Amb.	VENDOR: NORTHROP-Anaheim	
	NO. OF ITEMS TESTED Four	OGDEN QA-2

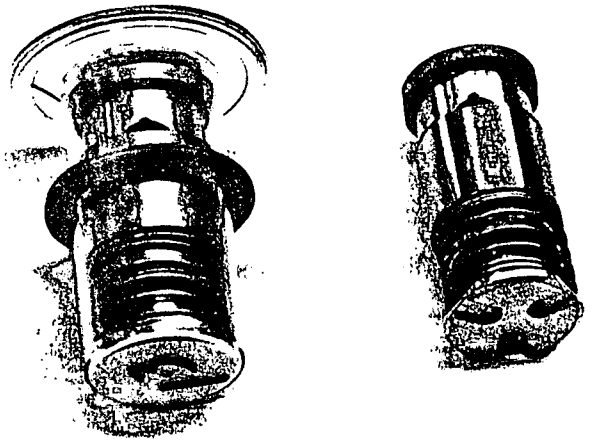
DROP NO.	TEST ITEM NO.	ORIENTATION OF IMPACT base 1=UP 2=Down 3=Horiz.	FIRE OR NO FIRE	VISUAL DAMAGE * = some deformation at impact point	Equipment: OTL Fab. 45 ft. Tower meeting MIL STD 331 plus guided drop.
1	1	2	NO FIRE	*	
2	2	2	NO FIRE	*	
3	3	2	NO FIRE	*	
4	4	2	NO FIRE	*	
5					
6					

Note: Each of the four Test Items was droped by quick release from forty feet, one time, base down, onto a two inch thick steel plate. The impacts were exceptionally flat and each box bounced approximately five feet to re-impact flat.

Results: There was only slight damage to the boxes. The Test Items appeared to be safe to handle and were returned to the Customer for further evaluation.

Berry F. Moore

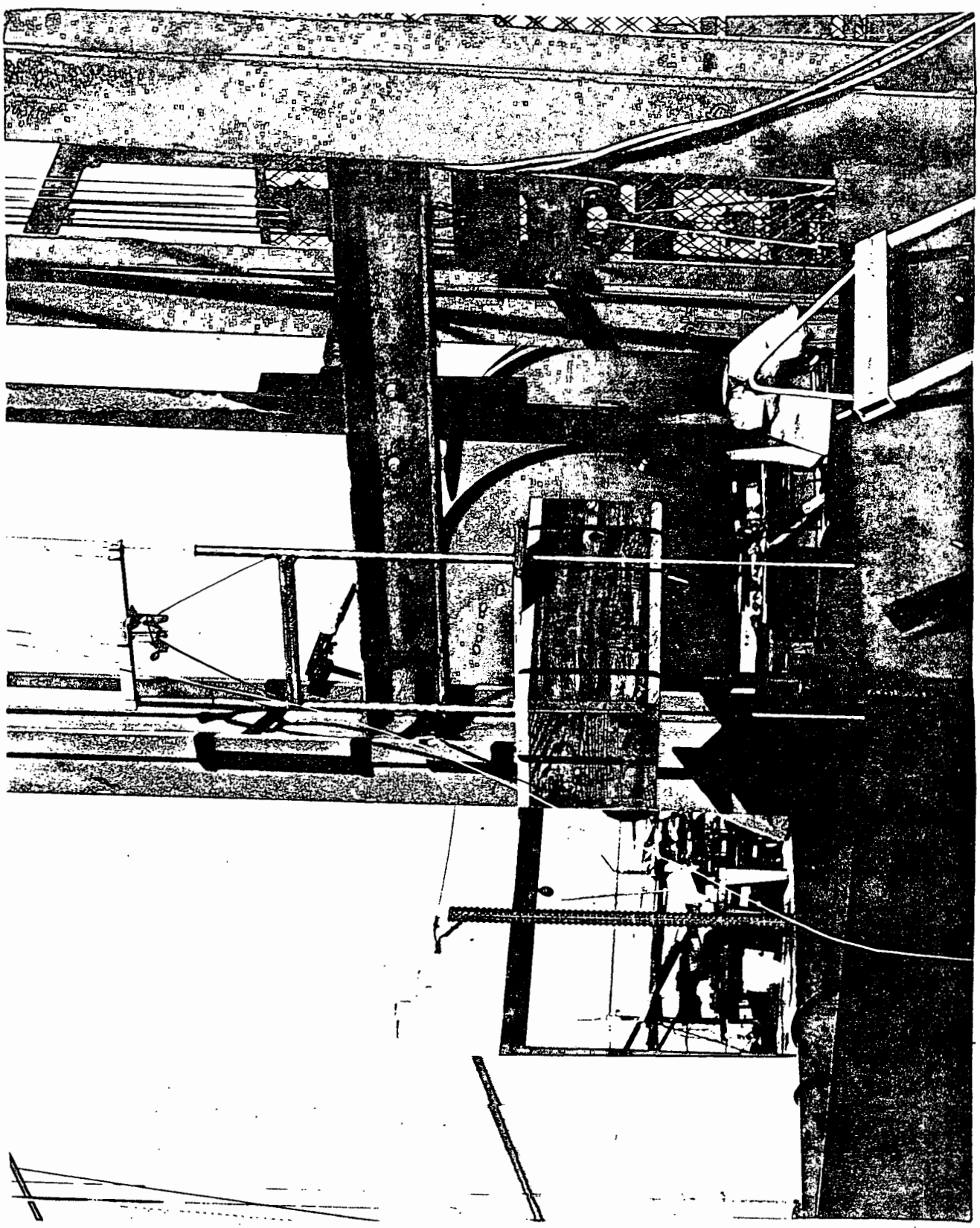
Note Two: A photo of the test set up was taken and is to be a part of the data.



Fuze Assemblies Removed From Warheads After Forty-Foot Drop Test.

Note That S&A Rotor Pin is in the Safe Position.

ETS NO. 300679-



40 FOOT DROP

ENGINEERING TEST SUMMARY

FORM NS 1829 (4-67)

ETS NO.	300679-4
T. W. O. NO.	300679
DATE	12-15-71

PROGRESS [ ]
FINAL [X]

TO: R. E. Wheeler

COPIES: T. Kew (4), file

TITLE OF T. W. O. OR SPECIMEN: Evaluation Test for Value Engineered Fuze Body and Firing Pin

DWG. NO.	MFRS DWG NO.	MODEL NO.	SERIAL NO.

MFR OF SPECIMEN	CITY	STATE
Northrop E.M.D.	Anaheim	Calif.

FUNCTION OF PART:

FOR INSTALLATION IN:

TYPE OF TEST	START TEST (DATE)	END TEST (DATE)
Fuze Assy Functioning Test	11-10-71	12-13-71

TEST ENGINEER	SUPERVISOR	COMPREHENSIVE REPORT FOLLOWS	YES	NO
				X

ORGN.	ZONE	EXT	REFERENCES:
			MIL-F-50541 TWO 300679, S.O. 1938-5107, S.O. 1938-5108

OBJECTIVE OF TEST:

To prove that Fuze Assemblies containing value engineered Fuze Bodies and Firing Pins will meet the Fuze Assembly Functioning Test requirements when tested in accordance with MIL-F-50541, para. 4.3.3.11.

NOTE: VECP 1938-5107 proposes making the Fuze Body from 7075-T651 aluminum and VECP 1938-5108 proposes making the Firing Pin from the same material.

SPECIMEN(S):

A sample of 205 Fuze Assemblies were tested.

45 Fuze Assemblies were subjected to Impact Shock Environment at a vendor facility. See attached test certification from Durkee Environmental Laboratories.

160 Fuze Assemblies were subjected to Aircraft Vibration.

DISPOSITION OF SPECIMEN(S):

Return to T. Kew

TEST EQUIPMENT AND IDENTIFICATION:

Direction of Test Setup(s) & Location:

Testing Performed and Results:

(1) The 160 Fuze Assemblies were subjected to Aircraft Vibration Testing at the Northrop Page Court Facility.

(2) Following Impact Shock Testing (45 Fuze Assemblies) and Aircraft Vibration Testing (160 Fuze Assemblies) the total sample of 205 Fuze Assemblies successfully passed the Fuze Assembly Functioning Tests. See attached Inspection Record Report prepared by DCAS.

FUZE WDU 4A/A-ALUM. BODY & Aluminum Firing Pin

PRODUCTION RECORD

INSPECTION STATION: P C C 1 STA #6

FACILITY	CONTRACT NUMBER	RECORD NUMBER
NORTHROP CORP. E. M.D. Page Court Facility Anaheim, Ca.	VECP 1938 - 5107	1

PART NAME	DWG OR PART NUMBER	SPEC OR CD AND REV
FUZE WDU 4A/A-ALUM. BODY ALUM. FIRING PIN	ENGINEERING DEVELOPMENT	IA/W PP 4.3.3.11 MIL-F-50541 / 160 ea. Parts

LINE	DATE 1971	LOT NO. OR PART	LOT SIZE OR SERIAL NO.	TIME	NO. OF OBSNS	NO. OF DEF. OBSNS	INSP INIT	LOT DISP	PLAN SPECIAL / CLASS MAJOR / AQL 100 % R	SAMP	AC	RE	DEF	PLAN / CLASS / AQL R	SAMP	AC	RE	DEF	PLAN / CLASS / AQL R	SAMP	AC	RE	DEF
1	NOV 10	VECP	20 - 20		140	0	W	ac	S	20	0	1	0										
2	DEC 1	VECP	20 - 40		140	0	W	ac	S	20	0	1	0										
3	2	VECP	20 - 60		140	0	W	ac	S	20	0	1	0										
4	6	VECP	45		180	0	W	ac	S	45	0	1	0		CENTRIFUGE OF IMPACT TEST LOT								
5	7	VECP	20 - 80		140	1	W	ac	S	20	0	1	1 *										
6	8	VECP	20 - 100		140	0	W-	ac	S	20	0	1	0										
7	9	VECP	20 - 120		140	1	W	ac	S	20	0	1	1 *				*	NOTE:	OVER				
8	10	VECP	20 - 140		140	0	W	ac	S	20	0	1	0										
9	13	VECP	20 - 160		140	0	W	ac	S	20	0	1	0										
10																							
11																							
12																							
T																							

	CHARACTERISTIC	Curve Z per Spec. Axis 1	Curve Z per Spec. Axis 2	Curve Z per Spec. Axis 3	NON ARM	TIME	ARM	FIRE	
PIT									
CL									
1		0	0	0	0	0	0	0	
2		0	0	0	0	0	0	0	
3		0	0	0	0	0	0	0	
4					0	0	0	0	
* 5		0	0	0	0	0	1	1	Ser. 76
6		0	0	0	0	0	0	0	
* 7		0	0	0	0	0	1	1	Ser. 104
8		0	0	0	0	0	0	0	
9		0	0	0	0	0	0	0	
10									
11									
12									
T									

* Asterisked characteristics are witnessed and special recording instructions apply.

DCRL FORM NOV 68 072 (REV.) STOCKS MAY BE USED UNTIL EXHAUSTED.

ETS NO. 300679-4

VALIDITY OF CONTRACTOR'S INSPECTION

LINE	PLAN						PLAN						PLAN					
	CLASS						CLASS						CLASS					
	AQL						AQL						AQL					
	CONS SAMP	CONS DEF	PROD SAMP	PROD DEF	ACT. LIMIT	COMP	CONS SAMP	CONS DEF	PROD SAMP	PROD DEF	ACT LIMIT	COMP	CONS SAMP	CONS DEF	PROD SAMP	PROD DEF	ACT. LIMIT	COMP
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		

CORRECTIVE ACTION

CA TYPE	* NOTE DETAILS
	Line 5 & 7, Serial No's 76 & 104 Failure to fire was from identical
	causes. Fuzes were both removed to another Centrifuge, equipped with
	Electronic Counter and Stroboscope, which showed normal actuation of the sleeve
	but failure of the Pin to leave the safe position and arm, due to a bind in the
	mechanism of the S & A Device. Change from a Wesclox to a K.D.I S & A and the
	fuze fired normally.
	Mr. Gurba was present and observed all of the above conditions.

REMARKS:

DCRL FORM 072
(REVERSE SIDE)

ETS NO 300679-4

Durkee Environmental Laboratories, Inc.
24660 South Crenshaw Boulevard • Torrance, California 90505
Phone: 534-0222

Dec. 3, 1971

CERTIFICATION

Northrop Corporation
Electro-Mechanical Division
500 East Orangethrope Avenue
Anaheim, California 92801

Purchase Order No.: E100-67571
Our Job No.: V 10268

Forty-five (45) Fuse Assemblies, S & A, (WDU-4A/A), were subjected to Shock Testing in accordance with DMR 5747 Attachment, "Impact Shock Test For WDU-4A/A Fuze Assembly".

The Fuze Assemblies did remain safe and did not fire as a result of this test.

DURKEE ENVIRONMENTAL LABORATORIES, INC

John S. Vander Laan

Subscribed and sworn to before me this

3rd - day of December, 1971.

Charlotte A. Nord
Notary Public

OFFICIAL SEAL
CHARLOTTE A. NORD
NOTARY PUBLIC - CALIFORNIA
PRINCIPAL OFFICE IN
LOS ANGELES COUNTY
My Commission Expires Feb. 16, 1974

Durkee Environmental Laboratories, Inc.

24660 South Crenshaw Boulevard · Torrance, California 90505
Phone. 534-0222

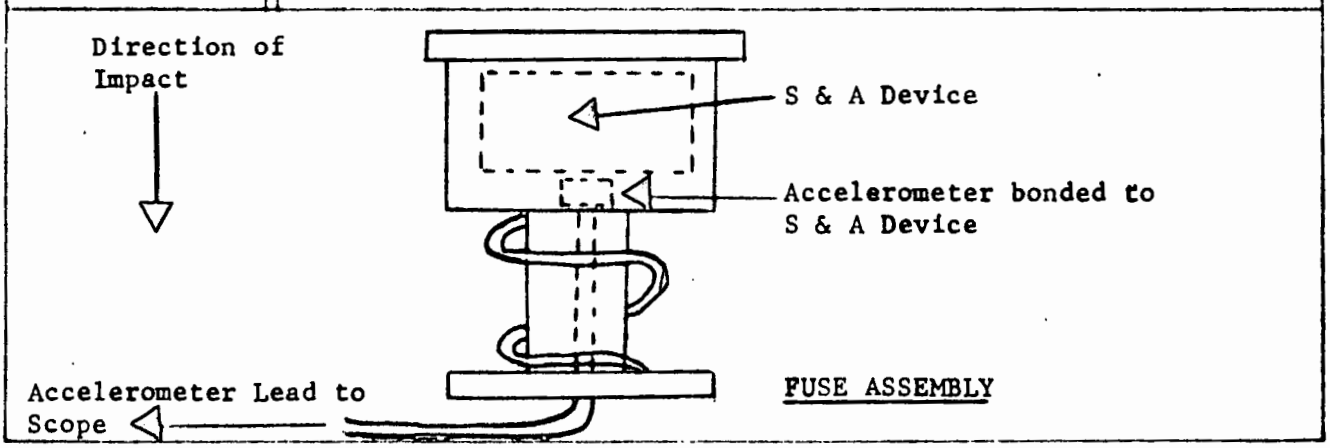
Customer Northrop Corp.
Part No. S & A Fuse
Spec. DMR 5747
Qty. N/A
S/N 1 thru 45

Job No. V 10268
Report No. P.O. E100-67571
Date 12/3/71
Amb. Temp. 70° ± 10°F
Photo Set-Up & Cal. Pulse
Test Media N/A
Specimen Temp. Ambient

Specimen FUSE ASSEMBLIES

Test Title SHOCK

Input Axis	Attached to fixture base down
Pulse Geometry	Half-Sine
Pulse Duration or Rise Time	13 milliseconds ± 2 milliseconds
G Level	44 ± 4 g's
Number of Shocks	Three (3)



Tested By [signature] Date 12/3/71 Witness

ETS NO. 300679-4

OGDEN TECHNOLOGY LABORATORIES, INC
Subsidiary of Ogden Corporation

1536 E. VALENCIA DRIVE, FULLERTON, CALIFORNIA 9263
TELEPHONE: 714/879-611C

3 December 1971

FULLERTON DIVISION REPORT NUMBER F-71663
Northrop Corporation P.O. No. E100-68308

A. TEST: 40 Foot Drop

B. TEST ITEMS: Four (4) Boxes, Each Loaded with Four (4) Warheads per DWG. 67D9700 and Packed per DWG. 66B10122.

C. SPECIFICATIONS:
1. MIL-F-50541 (MU), Paragraph 4.4.8.
2. MIL-STD-331, Test 103, Base Down Only.

D. RESULTS: This is to certify that the test items were subjected to the 40 Foot Drop Test according to the above specifications.

There was no indication that any of the packed items fired. The boxes were only slightly damaged.

The test items were returned to Northrop Corporation for final evaluation.

OGDEN TECHNOLOGY LABORATORIES, INC.

D. J. Valenzuela for
R. D. Short, Division Manager

Berry F. Moore
Berry F. Moore, Project Engineer

Subscribed and sworn to before me this 7th day of December 1971.

Ruth A. Vandergrift
Ruth A. Vandergrift, Notary Public in and for the County of Los Angeles, State of California. My commission expires Feb. 3, 1971.

OFFICIAL SEAL
RUTH A. VANDERGRIFT
NOTARY PUBLIC CALIFORNIA
LOS ANGELES COUNTY
My Commission Expires Feb. 3, 1973

R. J. McKelligott
R. J. McKelligott
Quality Assurance Manager

OGDEN QA-2

las

DATE STARTED: 12-1-71	PARTS TEST DATA	TEST ENGINEER: Berry F. Moore
DATE COMPLETED: 12-1-71	SPECIMEN DESCRIPTION: Four Test Items Boxes Loaded with 4 Warheads each. = =	P/N (66B10122)(67D9700)
TEMP: Amb.	TEST: 40 FOOT DROP	SPECIFICATION: MIL-STD 302 or 331 AND MODIFIED BY: MIL-F-50541 Para. 4.4.8.
HUMIDITY: Amb.	VENDOR: NORTHROP-Anaheim	OGDEN QA-2
	NO. OF ITEMS TESTED Four	

DROP NO.	TEST ITEM NO.	ORIENTATION OF IMPACT base 1=UP 2=Dowm 3=Horiz.	FIRE OR NO FIRE	VISUAL DAMAGE * = some deformation at impact point	Equiment: OTL Fab. 45 ft. Tower meeting MIL STD 331 plus guided drop.
1	1	2	NO FIRE	*	
2	2	2	NO FIRE	*	
3	3	2	NO FIRE	*	
4	4	2	NO FIRE	*	
5					
6					

Note: Each of the four Test Items was droped by quick release from forty feet, one time, base down, onto a two inch thick steel plate. The impacts were exceptionally flat and each box bounced approximately five feet to re-impact flat.

Results: There was only slight damage to the boxes. The Test Items appeared to be safe to handle and were returned to the Customer for further evaluation.

Berry F. Moore

Note Two: A photo of the test set up was taken and is to be a part of the data.

Memorandum

Northrop Corporation
Electro-Mechanical Division

To: Del Mott

From: Dave Belcher

In reply refer to: 6773-0-

Subject: 2.75 WDU-4/A Flechette Warhead Expulsion Charge

Date: 8 July 1970

Copies: File

Ref:

290 Lbs. of M9 propellant was received from the Government. Lot No. RAD 66311 was used in expulsion charge. Lot No. 288 thru 294. WEB Size of M9 propellant is .015, .013, .012, .012, .010. Lot No. 292 - 300 charges were checked. Seventy-five percent were oversize. Expulsion charge Lot 288 thru 294 should not be used.

Another Lot of M9 propellant - for comparison purposes:
Lot No. RAD 64668, used in expulsion charge assembly, Lot 295 on.
WEB size of propellant checked .021, .021, .022, .020, .017, .020.
We had 300 expulsion charges checked out of Lot 300. Thirty-three charges oversize.

Dave B.

Dave Belcher
Riverside Facility
Ordnance Laboratory

NORTHROP

9902-4701

6[illegible]-9-90/RMcK/dm
30 October 1969

REVIEW OF EXPLOSIVE ORDNANCE SAFETY PROCEDURES

	Function	Coverage
1.	Receiving	SPP 10-2 AMCR 385-224
2.	Handling	"
3.	Storage	"
4.	Dispersment	Explosives Magazine Log
5.	Processing and Expenditure	Procedures as required and posted at work and test sites.
	Experimental	Test Work Order with procedures as required
	Production	Procedures and Operating Instructions posted on the production line
6.	Transportation	SPP 10-2.1
	Internal	California State Vehicle Code Northrop Ordnance Drivers Handbook
	Delivery	California State Vehicle Code

NOTES:

1. Supplemental Documentation
   (a) Air Force Manual for Explosives Operations (AFM 127-100)
   (b) Regulation for the Handling of Dangerous Commodities (DOT)
   (c) Safety Procedures of other companies.
   (d) ATA Tarriff #13 (H. J. Sonnenberg)
   (e) DOT Tarriff #23 (T. C. George)
   (f) Health and Safety Code (California)

2. Indoctrination of Personnel - Requirement that each incoming technician and engineer read Northrop Ordnance Safety documents.

3. Training of Technicians - Current system for technicians is apprenticeship with experienced personnel.

4. Drivers of Explosive Loads - Special instruction is provided to personnel expected to drive vehicles transporting explosives.

5. Continuous Surveillance - Each new Test Work Order is reviewed particularly for explosive safety and a determination made and implemented as to the applicability of current procedures or the necessity for a revision or a new procedure. The activities involving use of explosives are reviewed in the laboratories, test sites and/or the production lines.

6. Design Review - Explosive devices, hazardous chemical devices, and associated equipment are reviewed in the design stage by the cognizant explosives personnel prior to hardware being loaded or equipment used.

O'Brady

2 February 1966

NORTRONICS ORDNANCE REMOTE SITE - RIVERSIDE, CALIFORNIA

PROPOSED SAFETY PROVISIONS

1. A sign identifying the company, operating hours, who to contact in case of emergency, and location of procedures manual will be posted at the main entrance to the facility.

2. Required quantity distances will be maintained between buildings and areas as spelled out in Ord Safety Manual M7-224.

3. Magazine and test areas will be enclosed with chainlink fencing or adequate natural barriers. "NO TRESPASSING" signs will be posted at prescribed points around the perimeter of the fenced areas.

The magazines will also be barricaded from the production and test areas, per AMCR-385-224 Table 1740.

4. Magazines, buildings and production bays will be posted with placards, per AMCR-385-224-1906, to indicate the number of personnel, type and quantity of explosives, as well as proper symbols for fire fighting purpose. Required to carry "safety item" stamp and signed off by Northrop Nortronics Industrial Safety Engineer.

5. All process and assembly buildings will be provided with exits per ORD M7-224-507-508; also, conductive floors will be provided where required.

6. Lighting in the process and loading buildings will be flush-type fluorescent, with wire glass lenses and vapor tight gaskets. All wiring and switches to be exterior of operating area, illumination to be adequate for specific functions.

7. Telephones will be located at strategic points in the area to provide immediate communications to outside emergency facilities (ambulance, fire, etc.). Industrial Relations representative will contact ambulance and medical services.

8. In work areas, where appropriate, deluge showers and eyewash fountains will be provided. Required to carry "safety item" stamp per AMCR-385-224, 1112/1113.

2 February 1966

NORTHROPICS ORDNANCE REMOTE SITE - RIVERSIDE, CALIFORNIA

PROPOSED SAFETY PROVISIONS

9. Other safety equipment, such as flameproof garments, safety shoes, safety glasses, face shields, fire blankets and static arresting devices, will be standard equipment in all operating areas where explosives are handled. Ref. AMCR-385-224, 1005/1014.

10. Smoking will be permitted only in designated areas where flameless lighters are provided.

11. Firebreaks will be provided as prescribed by the Forestry Department. All vegetation, debris, and combustible material will be kept clear of buildings and magazines.

12. Fire fighting equipment will be provided in sufficient quantities in accordance with materials and areas concerned. At least one piece of mobile equipment with a high pressure pump (approximately 600 PSI) and water tank will be provided.

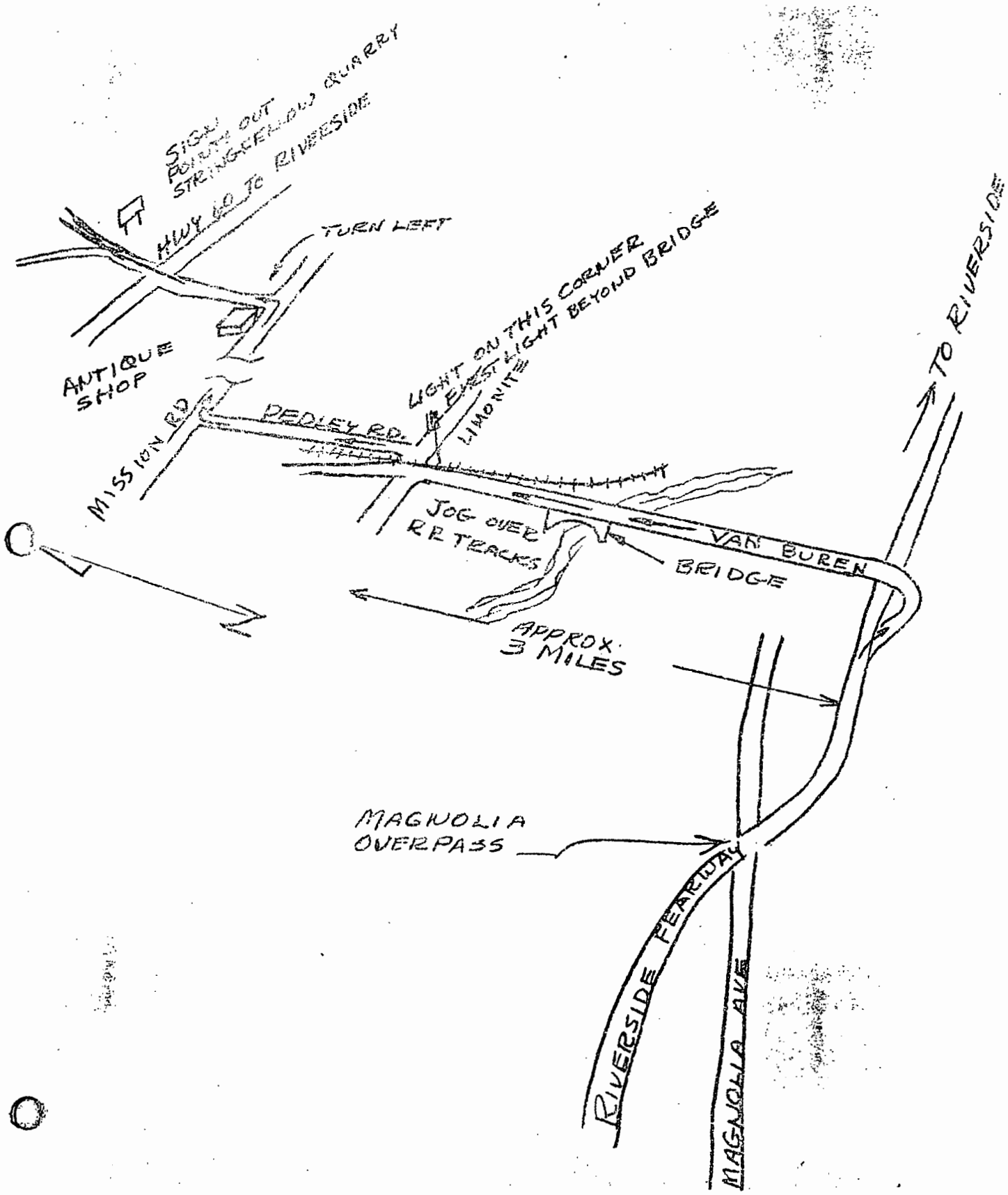
13. Proper evacuation procedures will be posted, and fire drills will be conducted periodically.

14. Proper control and conduct of personnel, whether normally assigned to the area or not, will be maintained.

15. Procedures and use of safety equipment applicable to explosive transport will be published and implemented in accordance with the appropriate regulations.

NORTHROPICS

A Division of Northrop Corporation


SIGN POINTING OUT STRINGFELLOW QUARRY
HWY 60 TO RIVERSIDE
TURN LEFT
ANTIQUE SHOP
MISSION RD
PEDLEY RD.
LIGHT ON THIS CORNER
EAST LIGHT BEYOND BRIDGE
LIMONITE
TO RIVERSIDE
JOG OVER RR TRACKS
VAN BUREN
BRIDGE
APPROX. 3 MILES
MAGNOLIA OVERPASS
RIVERSIDE FREEWAY
MAGNOLIA AVE

OPERATING PROCEDURE FOR A MIS-FIRE, HANG-FIRE OR FIRING LINE OPEN CIRCUIT

The term mis-fire as used herein is defined as a situation where the test item did not fire and there is no evidence that any portion of an electrically initiated ignitor train has been activated. A hang-fire is defined as a situation where there is evidence that all or part of the ignition train has been activated but the test item did not fire.

Mis-Fire: The test engineer shall immediately announce the situation and require that all personnel not move about and remain in a safe position.

After one minute has elapsed, measure the resistance of the firing circuit and compare this reading with that made prior to the firing attempt. If this reading seems normal, disconnect the firing line from the control box, short the leads together and check for proper firing voltage output.

If these preliminary checks do not locate the trouble, reconnect the firing line to the control box and put the circuit in a "safe" condition.

All personnel must remain in a safe position.

The test engineer (arming plug from control box in pocket) will observe the bomb initiator by means of a telescope from the safe/arm bunker at the arena and set the firing circuit to a "safe" condition at that point.

The detonator firing leads can now be disconnected and shorted.

The test engineer can now announce a limited "all clear" to permit the Ord. technician to enter the arena. All other personnel must remain at the bunker.

If observations deem it necessary, the initiator assembly can now be removed for examination.

When electrical and mechanical checks have located the trouble and appropriate remedial action taken, the test may resume by reverting to the planned procedure as directed by the test engineer.

Hang-Fire: The test engineer shall immediately announce the situation and require that all personnel remain in a safe position. The firing circuit shall be put in a "safe" condition at the control box.

After five minutes have elapsed, the test engineer (arming plug from control box in pocket) will approach the safe/arm bunker, place the firing circuit in a "safe" condition and proceed to remove the initiator assembly. If it is clearly evident that the electric detonator has fired, the test engineer shall announce

an "all clear" and permit the Ord. technician to enter the arena. All other personnel shall remain at the bunker unless directed otherwise by the test engineer.

Continuity Check Open Circuit: The test engineer shall announce the condition and require that all personnel remain in a safe position.

The firing circuit shall be put in a "safe" condition at the control box.

The Ord. technician:

1. Place the diring circuit in a "safe condition at the safe/arm bunker at the arena.
2. Remove the blasting cap from the initiator assembly.
3. Check all connections.
4. From the safe/arm bunker - make a continuity check.
5. Repair firing line or replace blasting cap as necessary.
6. Proceed with normal test procedure as directed by test engineer.

TWT/rc
11/7/66

6773-0-94/DKB:bfs
2 June 1970

ORDNANCE OPERATING PROCEDURE

TWO 5481 Date 6-2-70

Subject: Impact Extruded Warhead Burst Tests

Personnel Limits: 4 Test 1 Lab 1 Visitors 2

Explosive Limits:

4 Fuze Assy 6 lbs TEA
2 feet MDF
4 #8 caps

Special Protective Clothing

Flame proof lab coats
Rubber gloves

Special Protective Equipment -

Safety glasses

Prepared by:

D. K. Belcher

Approved by:

D. A. Mott, Manager
Ordnance Lab

J. W. Hock, Manager
Ordnance Test

6773-0-94/DKB:bfs
2 June 1970

ORDNANCE OPERATING PROCEDURE Impact Extruded Warhead Burst Tests

SK37655 Lead Schardin Booster

Press 350 mg of tetryl in one increment 8000 PSI at Y7 on the Bellows press.

SK37654 Booster, Misznay Schardin

Press 5.5 grams of RDX in one increment 10,000 PSI at Riverside on the 50 ton press. Press and remove from pressing tool remotely.

SK37657 Misznay Schardin Booster Assembly

Install lead, booster and spacer in fuze cover, install Schardin disc and crimp into fuze cover sufficiently to prevent parts from rattling.

SK37660-504 Fuze Assy

Install the fuze, in fuze cover (less the firing pin) in the in-line position, use 6" of MDF and a #8 cap to fire the fuze.

SK38111 Warhead

Remove the plug from a filled warhead. Drill a hole in the fuze well. Install adapter with nitrogen fitting. Use approximately 20 psi of nitrogen to pump the TEA from a prefilled warhead into a new warhead.

Testing

Warhead to be clamped approximately 4 feet above the ground. Install MDF & #8 cap. Fire the #8 cap with 45 volt battery. Witnesses to be approximately 200 feet from warhead when it is fired.

Subject: Multishot Misznay Schardin Pellet Pressing

Personnel Limits:
Three (3): Test none (0), Lab two (2), Visitors one (1)

Explosive Limits:
10 pounds

Safety Equipment:
Safety glasses
Flame Retardent shop coats
Ground wristlets

Prepared By:

D. K. Belcher

Approved By:

D. A. Mott, Mgr.
Ordnance Test Lab.

Dry RDX

Place RDX on a drying tray.

Place drying tray in a vacuum oven at 65° C for 4 hours

Weigh RDX and stearic acid.

Blend RDX and stearic acid

Place stearic acid on a U.S. 50 mesh sieve screen with two rubber stoppers.

Place screen and pan on the Ro-tap, turn on the Ro-tap, run the stearic acid through the screen to break up all lumps.

Place the screened stearic acid and the dry RDX in the twin shell blender, blend for one hour.

Place in a clean dry container for storage.

Press RDX Pellets

Load pellet press hopper with RDX and stearic blend.

Turn on press remote.

Place pellets in a clean dry container for storage.

Clean and cover pellet press.

Press Tetryl

Weigh tetryl (300 mg each pellet) dump into pressing tool and press to 8000 psi.

Remove from pressing tool and store in a clean dry container.

Assemble Fuze

(1) Install RDX and tetryl pellets in a fuze assembly

(2) Install misznay schardin steel disc on pellets and crimp.

0760-0-123/DKB:rc
9 September 1970

ORDNANCE OPERATING PROCEDURE

TWO_____
S.O._____

Subject: Multishot, Misznay Schardin Pellet Dent Test

Personnel Limits:

Four: Test one, Lab one, Visitors two

Explosive Limits:

6 Grams

Safety Equipment:

Safety glasses
Steel test chamber
Shorting plug

Prepared by:

D. Belcher

Approved by:

D. A. Mott, Manager
Ordnance Lab

J. W. Hock
Test

Safety Approval:

A. L. Van Der Most
Safety

ORDNANCE OPERATING PROCEDURE
Multishot, Misznay Schardin Pellet Dent Test

6760-0-123/DKB:rc
9 September 1970

Place dent block holding fixture in steel test chember (steel test chamber in melt cast area, Riverside).

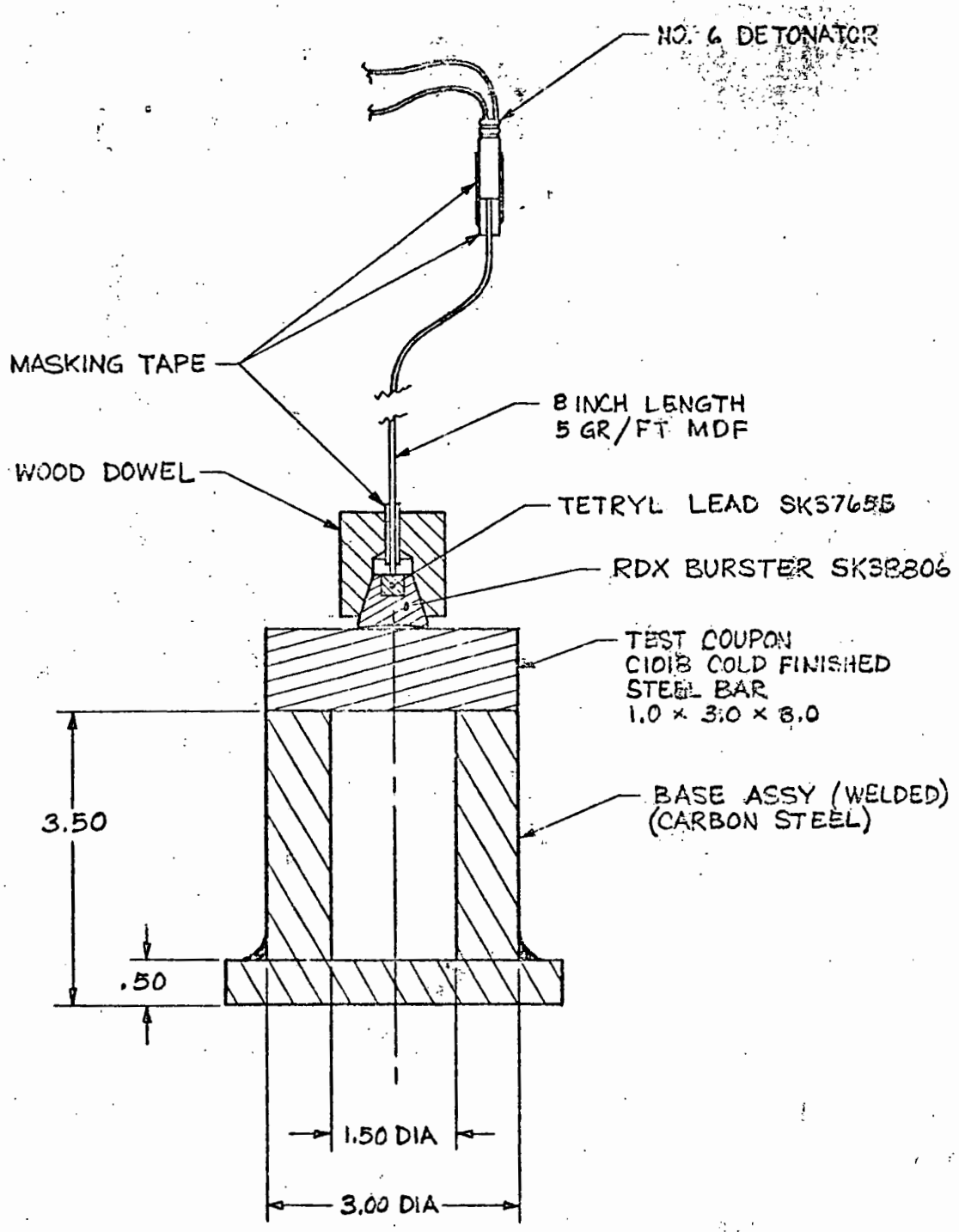
Cement RDX Pellet to 3. X 3 X 3/8" cold rolled steel plate (dent test block).

Cement detonator holder to RDX pellet.

Place dent block with RDX pellet on holding fixture.

Place 300 mg. tetryl pellet in RDX pellet and install #6 blasting cap and 5 gr/ft MDF.

Fire the test from outside of the test chamber using a 45 volt battery and a firing line shorting plug.


NO. 6 DETONATOR
MASKING TAPE
8 INCH LENGTH
5 GR/FT MDF
WOOD DOWEL
TETRYL LEAD SK57655
RDX BURSTER SK38806
TEST COUPON
C1018 COLD FINISHED
STEEL BAR
1.0 × 3.0 × 8.0
BASE ASSY (WELDED)
(CARBON STEEL)
3.50
.50
1.50 DIA
3.00 DIA

ENGINEERING TEST SUMMARY
FORM NS 1827 (4-67)

PROGRESS ☐
FINAL ☐

T.W.O. NO. 5484
DATE 11-27-70

TO: J. Reed

COPIES:
G. E. Garner
T. Nusbickel (2)
D. Belcher (2)

TITLE OF T.W.O. OR SPECIMEN: Development Base Burster Warhead

DWG. NO.	MFRS DWG NO.	MODEL NO.	SERIAL NO.
SK 38806			

MFR OF SPECIMEN	CITY	STATE
Northrop	Riverside	Cal.

FUNCTION OF PART: To Burst Multishot Warhead

FOR INSTALLATION IN:

TYPE OF TEST	START TEST (DATE)	END TEST (DATE)
Dent Test		

TEST ENGINEER	SUPERVISOR	COMPREHENSIVE REPORT FOLLOWS	YES / NO
D. Belcher	D. A. Mott		

ORGN.	ZONE	EXT	REFERENCES:
6773	Y20	613	

OBJECTIVE OF TEST:

The nature of this test is to see if the fuze will detonate the tetryl lead and RDX Misznay Schardin burster.

SPECIMEN(S):

The fuze was assembled complete less the Misznay Schardin Disc.

DISPOSITION OF SPECIMEN(S):

Fuzes were destroyed in test.

TEST EQUIPMENT AND IDENTIFICATION:

#6 Blasting Cap
Dupont AID MDF
45 Volt Battery
1.0 x 3.0 x 3.0 C1018 Cold finished steel bar test coupon

DIRECTION OF TEST SETUP(S) & LOCATION:

The firing pin was removed from the fuze, the fuze was set in the fire position. The fuze was set on the test coupon and was detonated by firing MDF into the fuze detonator.

TESTING PERFORMED AND RESULTS:

Dent Depth in Test Coupons:

.100"
.095"
.101"
.106
.101
.100
.105
.085
.101
.101
.099
.096
.100
.099
.091
.096
.094
.100
.105
.100
.099
.096

ENGINEERING TEST SUMMARY

FORM NS 1929 (4-67)

Order Ser

PROGRESS ☐
FINAL ☐

T. W. O. NO. D706305

DATE 23 Nov. 1970

TO: J. Reed

COPIES:

TITLE OF T. W. O. OR SPECIMEN: Misznay Schardin Burster

DWG. NO.	MFRS DWG NO.	MODEL NO.	SERIAL NO.
SK 38806			

MFR OF SPECIMEN	CITY	STATE
Northrop	Riverside	Calif.

FUNCTION OF PART:

FOR INSTALLATION IN:

TYPE OF TEST	START TEST (DATE)	END TEST (DATE)
Dent Test		

TEST ENGINEER	SUPERVISOR	COMPREHENSIVE REPORT FOLLOWS	YES / NO
D. Belcher	D. A. Mott		

ORGN.	ZONE	EXT	REFERENCES:
6773	Y20	613	Purchase Description Base Burster RDX Pellet

OBJECTIVE OF TEST:

Dent test to check out put of the pellets for lot acceptance

SPECIMEN(S):

A ten pellet sample was selected from the lot per para. 4.2.3.1.

DISPOSITION OF SPECIMEN(S):

Pellets destroyed in test.

TEST EQUIPMENT AND IDENTIFICATION:

#6 Blasting Cap
Dupont MDF with Det lead
45 volt battery
1.0 x 3.0 x 3.0 C1018 cold finished steel bar, test coupon.

ENGINEERING TEST SUMMARY (Continuation Sheet)
FORM NS 1629A (4-67)

D706305

DIRECTION OF TEST SETUP(S) & LOCATION:

Test setup per figure 1 in Purchase Description Base Burster RDX pellet.

TESTING PERFORMED AND RESULTS:

PELLET:

1	5.7 grams	.655" long	Dent Depth	.109
2	5.6 grams	.650" long	Dent Depth	.112
3	5.7 grams	.655" long	Dent Depth	.107
4	5.65grams	.650" long	Dent Depth	.116
5	5.6 grams	.650" long	Dent Depth	.1065
6	5.6 grams	.650" long	Dent Depth	.109
7	5.6 grams	.550" long	Dent Depth	.109
8	5.5 grams	.650" long	Dent Depth	.107
9	5.6 grams	.655" long	Dent Depth	.1065
10	5.7 grams	.655" long	Dent Depth	.109

T. Nusbickel

T. Nusbickel

From: (310) 331-6909
Elizabeth Brown
Northrup Grumman
101 Continental Blvd
4th Floor
El Segundo, CA 90245

Origin ID: HHRA

FedEx Express

J11201108050225

Ship Date: 03JAN12
ActWgt: 3.0 LB
CAD: 100505152/INET3210

Delivery Address Bar Code

Ref #
Invoice #
PO #
Dept #

SHIP TO: (415) 972-3125 BILL SENDER

Keith Olinger
U.S. EPA, Region 9
75 HAWTHORNE ST
ENFORCEMENT OFFICE (SFD-7-5)
SAN FRANCISCO, CA 94105

WED - 04 JAN A1
STANDARD OVERNIGHT

TRK# 7930 7712 9775
0201

82 JCCA

94105
CA-US
SFO

50FG1/61C1/F5F4

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