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LB LIAISON REPORT

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 - 2/4A - F. H. Longyear, SLR
 - 3/4A - H. W. Russ, SLE-4
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INTRODUCTION

This report is directed to the departments SLE and SLR and to the Sandia document files for information and retention. Comment and criticism by the recipients is welcome and desirable.

The body of this report deals primarily with the scope of the writer's activities. Details of specific actions are almost completely ignored since most of these are coupled with the actions and duties of other members of the department. The development in time of sections of the report is more or less concurrent and continuous, and no attempt is made to relate subjects by dates.

It is assumed that the reader will be a person with an average Sandia Laboratory background. On this account some general procedures of department SLR are discussed to orient the reader. These discussions are bounded by the writer's knowledge and should not be accepted as complete statements of fact. The reader should be aware that this is a report by and concerning an individual. Formal responsibility of LB stockpiling program is vested in department SLR. This program and its progress are described only to the extent necessary to complement the text.

Numerous references are made to complementary documents. These are indexed by arabic numerals preceded by the abbreviation, "Ref." All of these references are currently available in both SLR and SLE files.

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SUMMARY

This report is submitted as an accounting of the activities of the writer during the period from September, 1948 through February, 1949. A simple summary of these activities is stated in the following paragraph.

The writer was assigned to department SLR to assist in the transfer of the LB program from department SLE to department SLR. The procedures and facts compiled by SLE-4 up to September, 1948 were designed to suit the requirements of the LB stockpiling program. In department SLR, it was necessary to re-organize the same procedures and facts to suit the Road department general stockpiling program without disturbing production. The writer's duties were to act as an aide to the department in effecting the latter statement, and, in particular, to establish specifications in the form of catalogs. LB production is now being carried out with little or no assistance from the writer. It is assumed that his assigned task in SLR is completed.

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LB LIAISON REPORT

1. General Program

During the first two weeks of September, 1948, numerous responsibilities of division SLE-4 were transferred to SLR department. These responsibilities are summarized by the following excerpts from Ref. 1 dated 7 October 1948.

"Road Status

Present plan of operation is that all LB devices, Type A, B, and C, be completed, packaged, and transferred to Road Stable for ASC custodianship by storage at some site to be later selected....

"Method and Schedule for Transferring LB Responsibility to Road

As of September 10, 1948, Road responsibility was accepted by the Road Department for the LB weapon. Two (2) members from the original SLE-4 group were transferred to Road Department. Road Department will complete the inspection, assembly, and packaging of the Type A, B, and C weapons and test equipment. Mr. Russ will act as consultant to the Road Department...."

1.1 Action on the "Method and Schedule" paragraph was initiated as follows.

1.1.1 R. G. Pershing and W. H. Lawrence transferred from SLE-4 to SLR-7 and SLR-5 respectively. Mr. Pershing was made responsible for supervising LB mechanical assembly. The latter is the major technical job involved with LB production that requires talents peculiar to the LB program. Mr. Lawrence was requested to produce required catalogs and to assist in any other capacity that proved necessary.

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1.1.2 Mr. Carl C. Harrington of SLE-T proceeded to transfer LB components and tools to SLR. The major part of the required property transfer was completed by the end of October.

1.1.3 Appropriate literature from SLE-4 files was transferred to SLR by H. W. Russ. The majority of this literature relating to policy is in the custody of the Department Manager.

1.1.4 Division of Responsibilities

It was the intention of the SLR department head to carry out the LB program without recourse to new administrative procedures and this has been done.

The SLR department manager introduced the LB program to SLR division leaders and the staff personnel. They were requested to include the LB in their planning and to carry on the production program initiated by SLE-4. Cessation of LB production was supposed to last only until the necessary facts could be segregated and scheduled.

All materiel handled by SLR is processed through established channels. Individuals are not usually assigned continuous tasks on any particular type of weapon. In this way individuals become specialists in tasks that may be common to all weapons. At the same time only a few individuals in the department become cognizant of all the features of one weapon and the procedures used in processing it.

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Mechanical Assembly proceeded without appreciable interruption under Mr. Farthing's direction. Most other components and kits were channeled through other sections and divisions. This was convenient since most of the physical labor involved consisted of warehousing, inspection, and packaging and did not require arts peculiar to the LB. At the same time scheduling could not proceed until the details of the catalogs were presented.

It is the function of SLR-5 to compile the detailed information pertaining to all phases of weapon processing and to furnish the information as required by other divisions.

Consequently, in the pages that follow, activities of all natures are discussed. As each division or section in the division becomes involved with some phase of a weapon, they secure required information from SLR-5. In regard to the LB, SLR-5 was represented by the writer. In the beginning, responsibilities not normally expected of SLR-5 were assumed by the writer to keep the LB program active. Most of these responsibilities are now in the hands of the appropriate SLR divisions. New problems arise constantly which can most easily be solved in consultation with SLE. So, it may be assumed that SLR will request LB information from SLE until the program is completed.

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2. Catalogs

The first task of the author was the production of Little Boy Road Materiel Catalogs. Two types of reference were used: (a) Kit Lists and Parts List (Ref. 2 through 9) issued by SLE-4, and (b) existing FM Road Materiel Catalogs. (a) contained all the basic specification information needed. However, to agree with (b), it was necessary to rewrite all of the SLE-4 references. The LB catalogs were published by SLR and distributed by SLD during the months of October and November, 1948.

2.1 Establishing Contents of Catalogs

The writer was requested by W. F. Schaffer to establish a sub-committee for Little Boy Road Materiel. The committee would report to the Joint Road Materiel Board. The primary function of the committee was to review LB Kit requirements and confirm the existing lists or make recommendations for changes. The committee actually reviewed both kits and components.

The committee met on 14 September 1948. A report of the proceedings was submitted to the Joint Road Materiel Board 21 September 1948 (Ref. 10). The lists of components and tools prepared by SLE-4 were reviewed and generally approved. The basic philosophy of the SLE-4 lists was not changed. Shortly after the meeting, the writer received notice from the SLR department head to proceed with LB catalogs on the basis of the discussion in the initial committee meeting. The committee was not called to a meeting again.

The discussion in the one and only committee meeting was a valuable aid in preparing the catalogs. The philosophies followed by the Road Board and the primary users of the Catalogs were represented by representatives of departments SLE, SLS, SLE, and of AFSWP. The writer also attended one meeting of the Joint Road Materiel Board during this same period.

The meetings described provided part of the background necessary for converting SLE-4 lists to standard Road Catalogs. Following that time, the writer depended upon the assistance and advice of the Road Department office and members of division SIR-5 to produce catalogs that would satisfy the using agencies.

The SLE-4 materiel lists are termed LB-1, LB-2, LB-3, LB-4, LB-5, LB-6, and LB-7. Ref. 2 is a required supplement for these lists. The total contents of the SLE-4 lists comprised all of the tools and components recommended by SLE-4 that are needed for LB field operations. To abide by Road philosophy, the SLE-4 lists were divided into two groups. All lists including components were included in a Component Catalog, Catalog I. All lists exclusive of components were included in a Kit Catalog, Catalog II.

It was a logical necessity to publish Catalog II first. Catalog I consists mostly of components with well-defined specifications. It was possible to proceed with mechanical assembly work without access to a catalog. All the items of Catalog II had to be defined to suit the SIR system before work could proceed.

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2.2 Kit Catalog, LB

This appears in the document files as SIMS-35, Catalog of Road Materiel for Little Boy, Catalog II, Kit Materiel.

2.2.1 The Introduction of Catalog II was copied from the FM catalogs. A few changes in phraseology were made to suit LB nomenclature and to abide by the more simple field philosophy of LB.

2.2.2 The following kit lists were copied directly from the SLE-4 lists. The specifications for standard parts were amplified to suit an exact standard system.

Kit LB-2 Mechanical Assembly Tools

Kit LB-4 Primer Testing Kit.

2.2.3 Kit LB-7, Dry Batteries

This lists all dry batteries required for operation of tools and electronic test equipment. Additions were made to the SLE-4 list as specifications were made available by SLE-6 for test equipment. It was agreed by the Sub-Committee for Little Boy Road Materiel that LB-7 should provide 100% spares and that the dry battery kits would be stockpiled on a one-for-one basis with LB-1.

2.2.4 Kit LB-6, Fuzing Standard Tools

The SLE-4 list LB-6 was abbreviated to include Fuzing Standard Tools only. This list required discussion with SLE and SLR that

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was not in proportion to its size since most of the items were originally described more by function than by procurement specifications.

2.2.5 Kit LB-8, Special Electronic Test Kit

This list was lifted from the SLE-4 LB-6 list. A few additions were made as seemed appropriate by comparison with FM Kit A and Kit B. The description of major items will be modified whenever necessary to agree with the actual equipment available in stock and as recommended by the director and SLE-6.

2.2.6 Kit LB-9, Weaponeer's Kit

This kit is an exact duplicate of FM Kit P. Specifications are designed by AFSWP.

2.2.7 Kit LB-10, Flight Test Box

This is simply the test box with spares, carrying case, and shipping chest. (This list was incorrectly published as part of SLMS-37.)

2.3 Component Catalog

The Component Catalog is an enlargement of the SLE-4 lists LB-1, LB-3, and LB-5. The SLE-4 lists consist largely of items referenced to the parts list (Ref. 2). The Road Catalog users require that the items be specified in full wherever called out in the catalog and this has been done. Appendices were added listing parts of the LB-1 and LB-3 cans to provide a source for specification of replacement stock.

Supplements to Catalog I have been published describing LB mock-ups and ballistic assemblies. These supplements were produced in close collaboration with SLE-4. At the time the catalogs were published, approved SLE parts lists and kit lists had not been published for mock-ups and ballistic assemblies.

The LB component catalog is identified as Catalog of Food Materiel for the Little Boy, Catalog I, Components, consisting of the following Sandia documents:

- SIMS-38, Volume 1 - Mechanical Assembly
&
Propellant & Primers
- SIMS-37, Volume 2 - Instrumentation
- SIMS-46, Volume 3 - Nuclear Materiel
- SIMS-43, Supplement to Little Boy Catalog I,
Little Boy Mock-Up Catalog
- SIMS-40, Supplement to Little Boy Catalog I,
Little Boy Ballistic Assembly Catalog.

2.3.1 SIMS-38, Catalog I, Volume 1

The introduction to Volume 1 is written to assist users of all the volumes of Catalog I. The introduction to the F.M. Catalog I was used as a pattern, and about half of the paragraphs are copied exactly.

LB-1 is described in Section 1, SIMS-35. The first two pages are approximately a duplicate of Ref. 3. The balance of Section 1 consists of three appendices which list the details of the LB

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Gen, the AAA mechanical assembly, and the mechanical hardware spares. The appendices are compiled from Ref. 2 and from appropriate drawings.

LB-3 is described in Section 2. Section 2 is an approximate duplicate of Ref. 5 with the exception that a parts list of the can is included as an appendix.

2.3.2 SLMS-97, Catalog I, Volume 2

LB-5 is described in Section 1 of SLMS-97. Ref. 7 was used as a basis for this section. Descriptions of most items were obtained by cross-check with Ref. 2.

LB-10 occurs in SLMS-97, but should be in SLMS-35. It is described in this report in Paragraph 2.5.

2.3.3 SLMS-46, Catalog I, Volume 3

This catalog describes LB-12, 13, and 14. They do not have exact counterparts in SLE-4 publications, although the individual specifications are taken from Ref. 2. They are published as a stock reference for SLR department and as a basis for an approved nuclear LB catalog in the event that the need for same occurs.

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2.3.4 SIMS-43 and SIMS-40, Supplements to Catalog I

These volumes describe the Type B and Type C LB, the mock-up, and the ballistic assembly respectively. The supplements list the items peculiar to the Type B and Type C assemblies. Most components are common to the AAA assembly and are listed merely by reference to SIMS-38. There is not a formal reference on which to base the details of the supplements. The details were arranged by the writer, R. G. Pershing, and personnel of SLE-4.

2.4 Packing Sheets and Inspection Sheets

One of the functions of SLR-5 is to produce packing sheets and inspection sheets. The specifications contained in these sheets must conform to the catalogs literally to the letter. These were produced for LB as required. In an attempt to keep pace with production, most packing and inspection sheets were produced prior to or simultaneously with the catalogs.

Normal SLR procedures require inspection records for only a small quantity of the materiel listed in the catalogs. In the case of LB inspection records, it was convenient to produce Inspection Sheets for every item of LB materiel.

Packing sheets were produced in conjunction with SLR-4 and the prototype packing section of SLE.

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3. Procurement & Scheduling

During the early weeks, September and October, the writer attended weekly SLR Division Leader meetings to supply general LB knowledge and to confirm proceedings regarding LB. When it appeared that meeting procedures regarding LB were assuming a normal course, the writer stopped attending.

One of the primary questions directed to the writer regarded availability of materiel and new procurement required. The status of LB materiel was originally determined by the SLE-A monthly engineering status chart. The answers given served as a basis for scheduling LB production. In the beginning it was assumed that real schedules could agree with predictions as defined in the Stable reports of the summer of 1948. It became apparent that LB priority was not sufficient to overcome the myriad obstacles that blocked the original schedule.

Initiation of new procurement and expediting was carried on by the author as a continuous but waning task. LB scheduling and expediting gradually became spontaneous SLR functions.

During the period that the catalogs were in preparation, LB production scheduling was carried on by using amended SLE-A references and catalog rough drafts, and by continuous consultation of all concerned.

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4. Inventory

Scheduling of LB production required a knowledge of a real inventory. It was known by the writer that all major components and almost all the minor components and tools were on hand or due within a few weeks. It was not considered desirable to attempt a comprehensive survey and inventory of LB materiel, since this would eventually be accomplished by a scheduled inventory of all Road materiel in the custody of SLR. Consequently numerous surveys were carried out by the writer to determine the existence and location of LB materiel.

A comprehensive inventory of all SLR materiel was made in January of 1949. The writer was requested to monitor the inventory of LB stock. It was desirable to carry out the inventory in a special fashion. Due to the quantities and schedules involved, it was not considered economical to open, inspect, and warehouse all LB components. Most vendor's boxes were identified and counted by reference to shipping documents. It was realized then that someone with comprehensive knowledge of LB procurement details would be needed to adjust the records and confirm identification as the boxes were processed. This has proved true. A collection of papers related to LB inventory are included in SLR-5 LB file #2.4. These papers will be useful in solving future inventory and warehousing problems throughout the program.

5. Drawings

In the beginning, SLR files were almost devoid of LB drawings. To accommodate this situation, the drawings were collected in the form of photostats. When the majority of the LB drawings were available, these were divided into convenient groups and published (Ref. 11 through 17). These have been

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distributed to SLE-4, SLD, and interested groups in SLR. The balance of LB drawings were collected and filed numerically by normal SLR-5 routine.

6. Explosives

The major quantity of LB explosives was received at Sandia after assumption of the program by SLR.

By their nature, explosives require handling and procedures separate, if not unique, from other materiel. Storage of the bulk stores is handled informally by AEC security. Identification of these has been a continuous problem since SLR does not have direct custody.

Production of the LB explosive assemblies (Can LB-3) began in January. Prior to that time, specifications for LB-3 were under discussion and study by SLE-4, SLS, and SLR. Specifications were submitted by H. W. Russ (Ref. 18) and a prototype package was begun immediately. The prototype was produced in the presence of representatives of SLE, SLR, and SLS, and was inspected the following day by the SLS department head (Ref. 19).

On the basis of the proceedings related in the previous paragraph, Ref. 18 was re-written (Ref. 20) to suit SLR general methods and LB-3 production was scheduled.

7. Files

A small quantity of formal literature relating to the LB program is available in the custody of SLR-5. It is the intent of the writer that the folders referred to should remain intact and available until the end of the LB program.

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Retention of the literature in these files will be a matter for decision by SLR at a later date. Most of the literature pertaining to major program policy is in the custody of the SLR department head.

The SLR-5 LB files are segregated by a decimal system similar to one used by SLE-4. The numbers of primary subjects are listed below.

- 1.0 Program
- 1.2 Component Catalogs
- 1.3 Kit Catalogs
- 2.0 Procurement
- 2.4 Inventory
- 5.0 Drawings
- 9.0 Security
- 13.0 Propellant
- 15.0 Road
- 17.0 Inspection

7.1 A diary was maintained by the writer in notebook #SBN-149. This will be retained as a personal notebook on future assignments.

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- Ref. 2 SLE-4 (303), LB parts List, Type A, Classified Secret, dated 7/1/48
- Ref. 3 SLE-4 (206), Kit LB-1
- Ref. 4 SLE-4 (204), Kit LB-2
- Ref. 5 SLE-4 (205), Kit LB-3
- Ref. 6 SLE-4 (212), Kit LB-4
- Ref. 7 SLE-4 (270), Kit LB-5
- Ref. 8 SLE-4 (311), Kit LB-6
- Ref. 9 SLE-4 (437), Kit LB-7
- Ref. 10 Z-2913, Secret memo, W. H. Lawrence to Joint Road Materiel Board, dated 21 September 1948, Subject: Report of Sub-Committee for Little Boy Road Materiel
- Ref. 11 Z-12077, LB Drawings, Type B
- Ref. 12 Z-3956, Type A LB Drawings, Gun and Breech Assemblies
- Ref. 13 Z-11984, Type A LB Drawings, Nuclear Components
- Ref. 14 Z-3928, LB Drawings, Type A, Case Assembly
- Ref. 15 Z-12076, LB Drawings, Mounting Assemblies and Tail Structure
- Ref. 16 Z-3955, LB Drawings, Fuzing
- Ref. 17 Z-12086, LB Drawings, Kit Materiel
- Ref. 18 Z-12172, Secret memo, Russ to Longyear, dated 22 December 1948, Subject: S.O.P. for Preparation of LB-3

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- Ref. 19 Restricted memo, Lawrence to Russ, dated 3 January 1949,
Subject: LB-3 Inspection of Prototype
- Ref. 20 Confidential memo, Lawrence to Bailey, dated 24 January 1949,
Subject: Procedures, LB-3

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