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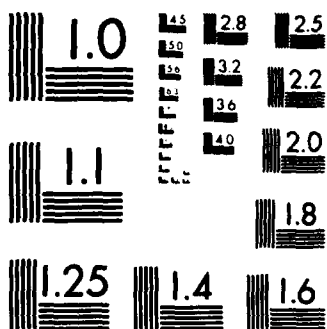
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LOGISTICS STUDIES OFFICE

PROJECT NUMBER ONE
TECHNICAL REPORT

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JULY 1985

U.S. ARMY MATERIEL SYSTEMS ANALYSIS ACTIVITY
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explosive, and about 168 are neither. This particular subset of SKO should be differentiated from other SKO by use of Type Codes so that the perennial question, "When is a SKO really a SKO?" can be permanently laid to rest.

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MANAGEMENT CONCEPTS REVIEW (PHASE I)

LOGISTICS STUDIES OFFICE
PROJECT NUMBER 061

TECHNICAL REPORT
JULY 1985

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SETS, KITS, AND OUTFITS (SKO)
MANAGEMENT CONCEPTS REVIEW (PHASE I)

Chapter 1. INTRODUCTION

1. Background.

a. Sets, Kits, and Outfits (SKO) range in size from small, inexpensive collections of minor items to depot overhaul sets, the components of which may exceed 1,000 items. The more complex sets may cost several hundred thousand dollars.

b. Management and control of the large sets (especially those consisting of hand tools) have historically been troublesome.

(1) For equipment related SKO, authorizations must be created, the proposed components determined, and all items procured or assembled prior to the fielding of the related equipment.

(2) Once fielded, the components of tool SKO are subject to being lost. Tools are easily left on a vehicular frame member after a repair job is completed. They are subject to borrowing for a mechanic's personnel work and may never be returned, or may be returned after an inventory. They may become the target for outright pilferage. Tools can miraculously appear prior to a change-of-accountability inventory, only to disappear just as miraculously after acceptance by a new accountable property officer.

c. As far as readiness is concerned, tools are just as essential as repair parts.

2. Problem Statement.

a. Some SKO are needed for mission support, while others maintain specific equipment. Often no link is apparent between authorizations for SKO and for the underlying equipment; thus, even though the supported equipment is withdrawn from the inventory, the SKO remains.

b. New SKO are sometimes developed without adequate consideration of existing SKO; such a situation can lead to proliferation of SKO components.

c. The problem is compounded because the boundary is not clearly drawn between those SKO which deserve increased management attention, those already being intensively managed, and those requiring little management attention. Although the Army Materiel Command is addressing SKO management, the first question which must be answered is, "When is a SKO really a SKO?"

DARCOM-R¹ 700-12, 2.a.(2), provides this answer:

"SKOs that are type-classified as standard in SB² 700-20; published in supply catalogs (SC) (component-list (CL) type); categorized as common- or general-purpose type; used for a specific mission or to perform a maintenance function on more than one end item; fielded for at least 6 months; and are included in Army Tables of Organization and Equipment (TOE) or authorization documents such as Modification Tables of Organization and Equipment (MTOE), Tables of Distribution and Allowances (TDA), Joint Tables of Allowances (JTA), and additive operational projects."

¹US Army Materiel Development and Readiness Command - Regulation
²Supply Bulletin

The reader will note that the preceding regulation divides the acceptable SKO into those used for specific missions (mission related) and those used to perform a maintenance function (maintenance related) on more than one end item. The reason for distinguishing between the two types of SKO is because mission related SKO is reviewed every four years while maintenance related SKO is reviewed at three year intervals. AR¹ 310-34 divides the same items into those whose components are documented by a Technical Manual (mission related) and those with components documented by a supply catalog and component listing (maintenance related). Refer to Appendix B for an extract of AR 310-34. It is interesting to note that the Army Materiel Command (AMC) uses the term SKO while the Department of the Army uses assemblages/sets. However, the two terms appear to have identical meanings.

3. Language Difficulties.

a. Although the problem "When is a SKO really a SKO?" is new to AMC, similar problems must have existed since the dawn of language. The term SKO means different things to different people.

'Then you should say what you mean,' the March Hare went on.

'I do,' Alice hastily replied; 'at least -- at least I mean what I say -- that's the same thing, you know.'

'Not the same thing a bit!' said the Hatter.²

If Alice had been speaking of SKO, the Hare and the Hatter would have been even more confused and disagreeable.

¹Army Regulation

²Lewis Carroll in Alice's Adventures in Wonderland (1865).

b. Another situation analogous to the SKO problem would be the case of a guest lecturer at a university biology class, who was to speak on the subject of "Blooms, Blossoms, and Flowers." If, after a few minutes of the presentation, the knowledgeable in his audience realized that he was actually addressing the unique subset of "Dandelions and Stinkweeds," even though he continued to refer to them as blooms, blossoms, and flowers, they could understand the lecture. Those who were less knowledgeable would have a perverted understanding of "blooms, blossoms, and flowers."

4. Objectives. The primary objectives of this management concept review are to:

- a. Create a better understanding of SKO.
- b. Eliminate unneeded or obsolete SKO.
- c. Consolidate similar SKO.
- d. Improve funding of SKO.
- e. Stimulate automation of SKO processes.
- f. Assure proper distribution of supply catalogs.
- g. Provide better requirements validation for SKO.

5. Limits and Scope (Phase I).

- a. Determine suitable and workable categorizations of SKO.
- b. Furnish the study sponsor with a machine listing of SKO.

6. Methodology. The study was accomplished through automated and manual screening of catalog data and publications files to determine the various existing types of SKO, so that the particular subset, which the sponsor desired to isolate, could be properly identified and defined.

Chapter 2. DEFINITIONS AND THE USAGE OF WORDS

1. Webster's SKO. The following definitions have been taken from Webster's New World Dictionary of the American Language (1972).

a. The noun kit has two definitions suitable for logistics applications:

(1) "b) a set of tools or implements c) equipment for some sort of activity, sport, etc. [a first-aid kit, a salesman's kit] d) a set containing a number of parts to be assembled [model airplane kit]"

(2) "a box, bag, or other container for carrying such parts, equipment, or tools"

b. The noun outfit has two definitions suited for logistics use:

(1) "a) a set of articles for fitting out, or equipping b) the equipment used in any craft or activity; paraphernalia [a mason's outfit, camping outfit]"

(2) "a fitting out; equipping"

c. The word set is one of the most frequently used words in the language and has many definitions and combination forms, but for logistics use there is only one suitable definition of the noun form:

"a collection of things belonging, issued, used, or growing together; specif., a) a number of tools or instruments used together [a carpentry set].... c) a number of books,

magazines, etc., often in a similar format, by one author, on one subject, etc. d) a matching collection of china, silverware, etc..... i) receiving equipment for radio or television assembled, as in a cabinet, for use...."

2. Discussion.

a. The word set is very broad in its meaning. In fact, almost everything that the Army has chosen to call a kit or outfit could, with equal propriety, be named set. The use of set almost exclusively would not have a strange sound to American ears.

b. While it would be nearly as appropriate to refer to all sets as either kits or outfits, such usage would sound odd to the ear.

c. Although Webster does not delineate differences based on size or complexity, observation of the long nomenclatures found in the Item Identification Records of the Army Catalog Logistics Data Base shows generally that kits are less complex sets, while outfits tend to be more complex.

d. Historically, if an item's heritage goes back to the Quartermaster Department, it seems that the item has a better chance of being named an outfit than would be the case for Ordnance items.

e. The word set has come to be applied to radio components installed in a single cabinet, and by extension can be applied to any largely electronic item even though its components are

installed in a single housing--television sets, repeater sets, radar sets, and others.

f. The Army's catalog data contains numerous examples in which the unit of issue is not in agreement with the item nomenclature. Often the unit of issue for a SKO is EA (each)--for example, one each set, one each kit, one each outfit. Although not in agreement, EA tends to make sense. On the other hand, there are examples of SE (set) being the unit of issue for an item whose nomenclature is kit, and vice versa; for example, one set kit, one kit set. While this usage may be technically correct, a person who is ordering such an item may occasionally wonder exactly what it is that will eventually be received. The most rational way in which to relate unit of issue to item nomenclature is to use SE, KT or OT as the unit of issue and to refrain from describing the item as a set, kit, or outfit. An excellent example is "BRIDGE, FLOATING: FOOT" with a unit of issue of SE; the requisitioner would expect to receive a set of pieces from which to assemble the bridge.

3. Possibilities for change. There are three courses of action which could result in some improvement, but which would be of negative benefit overall.

a. If a particular SKO is an item requiring special management, e.g., a general purpose tool set, SE could be used for its unit of issue, with KT and OT (and EA) being required for use with any other type of SKO. This would have been ideal if implemented 50 years ago. However, the massive changes required

today for implementation would likely create more problems in the cataloging area than would be cured in the SKO area. Not only would the concurrence of the other users of the Federal Catalog System be required, but this course of action goes against the way people write and understand the American language.

b. If an electronic set is housed in one enclosure, EA could be used exclusively for its unit of issue. Then SE could be reserved for use with electronic sets consisting of more than one component, where each component is separately housed. This might be of some benefit to the managers of the items, but would not help the special management of SKO. Most electronic sets are not general purpose and are already being intensively managed. Again, this course runs counter to the way people instinctively use the language, and its implementation would assure a host of errors.

c. A description of whether the SKO was mission related, maintenance related (equipment oriented), or maintenance related (general purpose) could be incorporated into the item's nomenclature, using abbreviations. Such a course of action would require the concurrence of other users of the Federal Catalog System. This concept should be given no further consideration because there is a better way to identify SKO type without consuming valuable space in the item nomenclature field.

Chapter 3. THE POPULATION OF SKO

1. The first step in the research was to identify everything that the Army calls sets, kits, and outfits. The Catalog Data Activity supplied six reels of magnetic computer tape containing 2.4 million card images, consisting of item identification records and item data records for all cataloged items used by the Army as of August 1984.

a. A search was then conducted, extracting the data for all sets, kits, and outfits. The criteria used to extract qualified items were:

(1) The unit of issue (i.e., SE, KT or OT (set, kit, outfit)), or,

(2) The nomenclature of the item where narrative contained either the words set, kit, or outfit, or a reasonable abbreviation (such as "out" for outfit).

b. The search yielded 32,000 items. However, this is only an approximation because:

(1) Items such as "Housing, radio set" were identified by the computer program as a set, and

(2) Items having reasonable abbreviations used in their nomenclature, such as "out dia" for "outer diameter," were identified as outfits.

(3) On the other hand, if an item's nomenclature were concatenated ("Radioset" instead of "Radio Set"), it would not have been counted, unless its unit of issue were SE, KT or OT.

c. This then is the real world of SKO--32,000 items. Most are low value, low demand items for which special management is neither needed nor wanted.

2. Some SKO have been assigned Line Item Numbers (LIN) for use in authorization documents and in TOE. Although not in use at the present time, an appropriate term to apply to this particular subset is "LIN-SKO."

a. LIN are assigned to items for either or both of these principal reasons:

(1) Requirements determinations can be based on initial issue quantities. This process is far more accurate than relying on forecast demand, and it is routinely used for calculating most major item requirements.

(2) Using organizations maintain more stringent control of the items by entering them on their accountable property records.

b. While lack of any SKO item may cause difficulties, the LIN-SKO subset has the potential for creating the most havoc. Cost consideration makes any routine special management procedures for those SKO outside this subset impractical.

c. The whole SKO population was then scanned to extract the LIN-SKO subset. The items so identified totaled 3,021 stock numbers. However, upon visual examination of the print-out, many items were noted which are not subject to the problems stated in paragraph 2, Chapter 1.

3. Next, using computer programming as well as manually manipulating file data via a terminal, an analyst assigned each item to one of 31 item classifications. These are listed below, together with the item count.

Classification	Items
Accessory Kits	134
Alarm Sets	101
Bridging Equipment	17
Cable Sets	19
Camera Sets	54
Chaplains' Gear	10
Communications (other)	61
Detectors	23
Explosives	14
Fire Control Items	16
Generators	23
Graphic Equipment	78
Installation Kits	243
Maintenance SKO	40
Medical Materiel	157
Modification Kits	7
Radar Sets	27
Radiac Sets	14
Radio Sets	145
Receiving Sets	42
Recording Sets	27
Recreational Items	37
Repeater Sets	32
Shop Equipment	278
Teletype Sets	76
Test Sets	613
Tool SKO	491
Training Sets	28
Transmitters	24
Unclassified SKO	175
Water Sets	15

The reader should keep this caveat in mind: The assignments were made by one individual with little technical knowledge of the items themselves. Each item's nomenclature served as the sole source of guidance. Therefore, the figures stated above must be considered approximations.

(1) Accessory Kits (count of 134) consist principally of electrical wiring harnesses for vehicles, mostly managed by the Communications Electronics Command (CECOM). The group is not completely homogeneous; it includes kits of tarp-bows for trucks, a parachute accessory set, accessory outfits for field ranges, and Pershing II accessory kits. Wiring harnesses are assigned LINS to aid their managers in determining time-phased requirements so that receipts of harnesses closely match receipts of the vehicles for which they are intended. They should require no more special management than they are now receiving. Wiring harnesses by themselves are neither mission nor maintenance oriented.

(2) Alarm Sets (count of 101) are all used for anti-intrusion. CECOM manages 98; and the Troop Support Command (TROSCOM), 3. These sets may be considered as mission related.

(3) Bridging Equipment (count of 17) is all managed by TROSCOM. Fixed and floating bridges, as well as erection sets, are included. This classification appears to be totally mission related.

(4) Cable Sets (count of 19) are principally power or signal distribution sets which are managed by the Missile Command (Micom), but cable reinforcement sets (for bridges), a cable swaging kit, and a cable splicer's kit are included. Most items are mission related, but the cable repair items are maintenance related.

(5) Camera Sets (count of 54) are a homogeneous grouping, managed by CECOM, except for two TROSCOM-managed truck mounted camera sections for topographic reproduction. All appear mission related.

(6) Chaplains' Gear (count of 10) is managed totally by the Defense General Supply Center. It consists of such items as communion sets and Protestant, Catholic and Jewish chaplain's kits. It is neither mission nor maintenance related, but is assigned LINS to aid the user in accounting.

(7) Communications (other) (count of 61) groups those items which are not radio sets, receivers, transmitters, or teletype equipment. Most are CECOM items. Examples are multiplexers, crypto auxiliary set, intercom sets, switching sets, and colored smoke signal kits (for personnel distress). None appear to be maintenance related; most appear mission related.

(8) Detectors (count of 23) reveal the presence of infrared and electromagnetic radiation, mines, fuel contamination, and concealed weapons. Some of these detectors may be considered maintenance related, e.g., fuel contamination detectors.

(9) Explosives (count of 14) are detonator, demolition, and foxhole digging kits managed by the Armament, Munitions, and Chemical Command (AMCCOM). All appear mission related.

(10) Fire Control Items (count of 16) are used in laying artillery and missile launchers and for target designation.

AMCCOM and MICOM are the principal managers. Again, these are mission related.

(11) Generators (count of 23) are a homogeneous grouping of electric power generators, mounted and unmounted, powered by gasoline, diesel or turbine engines, and managed by TROSCOM, except for one CECOM managed hydrogen generator. These, too, are mission related.

(12) Graphic Equipment (count of 78) consists principally of topographic sets managed by TROSCOM, with a sprinkling of photographic sets managed by CECOM. They are all mission related.

(13) Installation Kits (count of 243) are used to install specific radios in specific types of vehicles. Some chemical, biological and radioactive protective equipment also require installation kits for vehicles. The managers are principally CECOM, the Communications Security Logistics Activity, and AMCCOM. The discussion of accessory kits in the preceding subparagraph (1) applies equally here to installation kits, which are wiring harnesses and brackets used mostly for installing radios.

(14) Maintenance SKO (count of 40) are items grouped together simply because their nomenclature describes them as maintenance sets or kits. Probably each should be reclassified with either Tool SKO or Shop Equipment, but more than item nomenclature must be known for this action to be successful. Predominant use of the unit of issue KT may signify that most of

these items belong in tool SKO. How many are equipment related as opposed to general purpose is not known.

(15) Medical Materiel (count of 157) consists of items placed in this classification solely because the data for their Army cataloging actions originated with the Medical Materiel Agency. All are managed by the Defense Personnel Support Center (DPSC) and are used for medical, dental and veterinary purposes. No equipment maintenance items were noted.

(16) Modification Kits (count of 7) are managed by TROSCOM, CECOM, MICOM, and DPSC. Little more is known of these items. Perhaps assignment of LINs aided the requirements determination process.

(17) Radar Sets (count of 27) are managed mostly by CECOM with MICOM also represented in this grouping. This classification is totally mission related.

(18) Radiac Sets (count of 14) are managed by CECOM, AMCCOM and MICOM. Their nomenclatures suggest that a part of this grouping may consist of laboratory sets, with the remainder being mission related.

(19) Radio Sets (count of 145) are totally managed by CECOM. Because of English language conventions discussed in the preceding chapter, there is no way to readily identify (from the nomenclature) those items which are one piece and those which consist of several pieces; however, all are mission related.

(20) Receiving Sets (count of 42) are managed mostly by CECOM, but some are items of the Electronics Materiel Readiness Activity (EMRA). All appear to be mission related.

(21) Recording Sets (count of 27) are principally for recording and reproducing sound, although some record other things. The managers are CECOM and EMRA. Again, they are mission related.

(22) Recreational Items (count of 37) are an assortment of mixed athletic equipment and musical instruments. One item, timbales, is a type of pastry; the assumption was made that the item is actually timbals. All except two are managed by the Federal Supply Service. These are the types of items to which LINS are assigned to facilitate the accounting process at the user level.

(23) Repeater Sets (count of 32) are all used to repeat radio signals. The managers are CECOM and EMRA. These are mission oriented.

(24) Shop Equipment (count of 278) includes those items having the word shop in their nomenclatures as well as items whose descriptions suggest shop usage and mobile sets whose nomenclatures suggest that they are based at a fixed or semi-fixed installation. All Major Subordinate Commands (MSC) manage at least some shop equipment. Although all are maintenance related, many may be oriented to specific equipment as opposed to general purpose.

(25) Teletype Sets (count of 76) are all managed by CECOM except for one EMRA item. These are mission related.

(26) Test Sets (count of 613) include items in which the nomenclatures contained the word test or if the nomenclatures suggested that the items were used in some way for testing or for fault isolation. All MSCs manage at least some test equipment. While all of these are maintenance related, many are applicable to a specific item of equipment.

(27) Tool SKO (count of 478) consists of items with the word tool, repair, or service in the nomenclatures. Other items whose descriptions suggested that they were more in the nature of tools than of machinery were added to this classification. Again, all MSCs manage at least some tool SKO. This classification is the most likely to contain a large number of general purpose maintenance related items.

(28) Training Sets (count of 28) are a non-homogeneous menagerie having only the training function in common. Examples are training sets concerning map reading, Soviet land mines, field artillery, floating bridges, and guided missiles. No suspected maintenance related SKO were found in this classification.

(29) Transmitters (count of 24) are all emitters of radio waves except for a Dragon infrared transmitter. CECOM manages all items except one. They are mission related.

(30) Unclassified SKO (count of 175) represent one of a kind (embalming kit) or too few of a kind (rawin sets) for a

separate classification. No items appear to be maintenance related.

(31) Water Sets (count of 15) contain the word water in their nomenclatures. Examples are water well, water storage, water purification, water quality control, and water demineralization. TROSCOM is the sole manager of items in this classification. Again, no items appear to be maintenance related.

4. The conclusion derived from this first step is that the item nomenclature and unit of issue can point to groups, such as Tool SKO, which have a high likelihood of containing many items requiring special management attention. However, even such groups as Tool SKO can contain a large percentage of items documented by technical manual and already intensively managed.

5. There is other information available in the Item Data and the Item Identification records. These data have been studied for possible keys or combinations of keys by which the desired subset of SKO can be extracted, but to no avail. The following items were examined:

- Originator Code
- Federal Supply Class
- Maintenance Repair Code
- Materiel Category Code
 - (Weapon System Code)
- Source of Supply Code
- Automatic Return Item Code
- Fund Code
- Essentiality Code
- Reportable Item Control Code
- Accounting Requirements Code
- Shelf Life Code
- Special Control Item Code

Physical Security/Arms, Ammunition and
Explosives Security Risk/Pilferage
Codes
Acquisition Advice Code
Air Eligible Category Code
Logistics Control Code
Phrase Code
Recoverability Code
Special Requirements Code
Supply Category of Materiel Code
Price Field

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Chapter 4. SUPPLY CATALOG/COMPONENT LIST ITEMS

1. There is a subset of SKO, the composition of which is documented by technical manuals. This subset consists generally of items which are more complex to use, and the manuals provide instructional material in addition to the information needed for accountability purposes. There is another subset of SKO, the composition of which is documented by supply catalogs and component listings. This subset consists generally of less complex items; the knowledge necessary for their use is acquired at service schools during Military Occupational Specialty training. This latter subset is mutually exclusive of the first subset.
2. The second step in the research was to match LIN-SKO with supply catalogs using a listing of publications provided by the Materiel Readiness Support Activity on two reels of magnetic computer tape. Out of a population of 3021 LIN-SKO, there were 682 items documented by supply catalogs and component lists (CL). For the remainder of the report, this subset will be referred to as CL-LIN-SKO (pronounced cee-el-len-sko).
3. The CL-LIN-SKO were then matched to the nomenclature based classifications with the following results:

<u>Classification</u>	<u>Total Items</u>	<u>Total CL-LIN-SKO</u>	<u>Percent CL-LIN-SKO</u>
Accessory Kits	134	1	0.7%
Alarm Sets	101	0	-
Bridging Equipment	17	10	58.8%
Cable Sets	19	1	5.3%
Camera Sets	54	2	3.7%
Chaplains' Gear	10	0	-
Communications (other)	61	0	-
Detectors	23	1	4.3%
Explosives	14	3	21.4%
Fire Control Items	16	5	31.3%
Generators	23	0	-
Graphic Equipment	78	41	52.6%
Installation Kits	243	0	-
Maintenance SKO	40	10	25.0%
Medical Materiel	157	66	42.0%
Modification Kits	7	0	-
Radar Sets	27	0	-
Radiac Sets	14	0	-
Radio Sets	145	0	-
Receiving Sets	42	1	2.4%
Recording Sets	27	0	-
Recreational Items	37	0	-
Repeater Sets	32	0	-
Shop Equipment	278	205	73.7%
Teletype Sets	76	0	-
Test Sets	613	14	2.3%
Tool SKO	491	252	51.3%
Training Sets	28	3	10.7%
Transmitters	24	0	-
Unclassified SKO	175	57	32.6%
Water Sets	15	10	66.7%

4. The preceding table indicates that half of the Tool SKO, three-quarters of the Shop Equipment, and one quarter of the Maintenance SKO, totaling 467 items, are not receiving the intensive management normally accorded items which are documented by technical manuals. Yet, these are the items most troublesome at the user level. Some additional maintenance related items are likely to be found in Bridging Equipment, Cable Sets, and Test Sets, bringing the total to around 500 items.

Chapter 5. DISCUSSION

1. An examination of the CL-LIN-SKO listing suggests that four general classes of items are contained therein:

a. Those which are maintenance related but not oriented to a specific system or family of similar systems. "Common type" or "general purpose" is the modifier normally used to describe this class. An example is a general mechanics tool set, which can be used to tighten and loosen bolts on any equipment item so long as the item is fastened together with bolts. For purposes of the study, this class will be called CL-LIN-SKO, TYPE 1.

b. Those which are maintenance related and which are oriented to a specific system or family of similar systems. An example (based on nomenclature) is a diesel locomotive engine maintenance kit. To work on a diesel locomotive engine, a mechanic would need this kit in addition to a general mechanics tool set. For the remainder of this study, such items will be referred to as CL-LIN-SKO, TYPE 2. The expression, "family of similar systems," in most instances would mean a basic model (M1) as well as follow-on models (M1A1, M1A2).

c. The rest are not maintenance related and will, if non-explosive, be referred to as CL-LIN-SKO, TYPE 3. An example is a plotting set for artillery fire control.

d. Explosive CL-LIN-SKO will be referred to as TYPE 4.

2. In the previous chapter, the process of matching catalog and publication data to identify CL items within the LIN-SKO subset

was described. Without computers the task would have been too time consuming to perform, but, even with data processing facilities, it should not become a routine procedure because of its inconvenience and its consumption of machine time. If an Army used item has a stock number assigned, catalog data may not be complete, but there will be at least some data concerning that item on file. However, the confidence level is not as high for publications data. Is it possible, for many items or even for one item which should have been documented by a supply catalog and component list, that no publication was ever planned or printed? If such an omission(s) does exist, it will never be identified by file matching.

3. One of the objectives of AR 708-1 is to insure that Type 1 and Type 2 CL-LIN-SKO are scheduled for cyclic review every three years, and that Type 3 and Type 4 are scheduled every four years. Thus, a division into only two categories, maintenance related and not maintenance related, serves admirably for meeting current regulatory requirements. However, given AMC's desire to increase the intensity of management, a two division breakout will not suffice.

4. The second objective of the SKO Management Concept Review is to eliminate unneeded or obsolete SKO (and, by implication, unneeded or obsolete components within a SKO). Whatever new management techniques are eventually devised may have vastly different procedures for control of each of the four types.

5. The third objective of the SKO Management Concept Review is to consolidate similar items. Such consolidations, in the near future, would likely not cross Type boundaries, and a division into the four Types would facilitate the process. Type 1 items could be examined first, since the payoff in this category is deemed to be highest.

6. The fourth objective of the SKO Management Concept Review, to improve funding, would not be adversely affected by classification of the items into four types, and might even benefit. At the present, discussion of changes in funding procedures would be premature.

7. The fifth objective of the SKO Management Concept Review, to stimulate automation, promises to be enhanced by breakout into the four Types, because different programs or subroutines within programs can be Type-related.

8. The sixth objective of the SKO Management Concept Review is to assure distribution of supply catalogs. Refer to paragraph 2 of this Chapter. AMC has the capability now of monitoring CL-LIN-SKO items if those items have any publications data associated with them. Items (if any), which should have catalogs but do not, cannot readily be identified.

9. The last objective of the SKO Management Concept Review, to provide better requirements validation [for CL-LIN-SKO authorizations], will be unaffected by classification of the items into Type.

10. Type Codes 1 through 4 have been used here. However, if Type Code assignments are implemented, it may well turn out that more types can be identified, leading to more appropriate management procedures for each separate type. In the long run, it may even be desirable to assign Type Codes to LIN-SKO which are documented by technical manual or by other means. A one position code can be numeric 0 through 9 and alphabetic A through Z (excluding I and O), for up to 34 different Types of SKO. The number is large enough so that no consideration should be given to a two-position Type Code.

11. Type Codes have other capabilities as well. Type A could be assigned to items which would normally be Type 1 but which are of such low planned density that most special management procedures should not apply. Type B, C and D could be used for similarly situated Type 2, 3 and 4 items respectively. Type X (exempt) could be used for CL-LIN-SKO if planned density was low enough to render all special management procedures counterproductive.

Chapter 6. FINDINGS AND CONCLUSIONS

1. Nothing presently contained in the Item Identification or Item Data records of the Army Logistics Catalog Data Base can be used to extract the desired subset of SKO. Both item nomenclature and unit of issue are victims of the vagaries of the American language and are therefore useless as determinants. Other data elements, used singularly or in combinations, also fail to delineate SKO. However, one data element, the LIN, can be used to positively determine about 29,000 less significant sets, kits and outfits which are outside the desired subset, leaving 3,021 items (see Figure 1).

2. Items on the LIN-SKO listing, for which supply catalogs and component listings are published, are a close match to the desired subset. These items, most properly called CL-LIN-SKO, appear to fall handily into four Types:

- a. Common type or general purpose, related to maintenance of equipment,
- b. Maintenance related but oriented to a specific system or family of systems,
- c. Neither explosive nor related to maintenance of equipment items, and
- d. Explosive.

3. Criteria, based on CL-LIN-SKO densities and costs and to be used for determining the practicality of special management procedures, have not yet been developed.

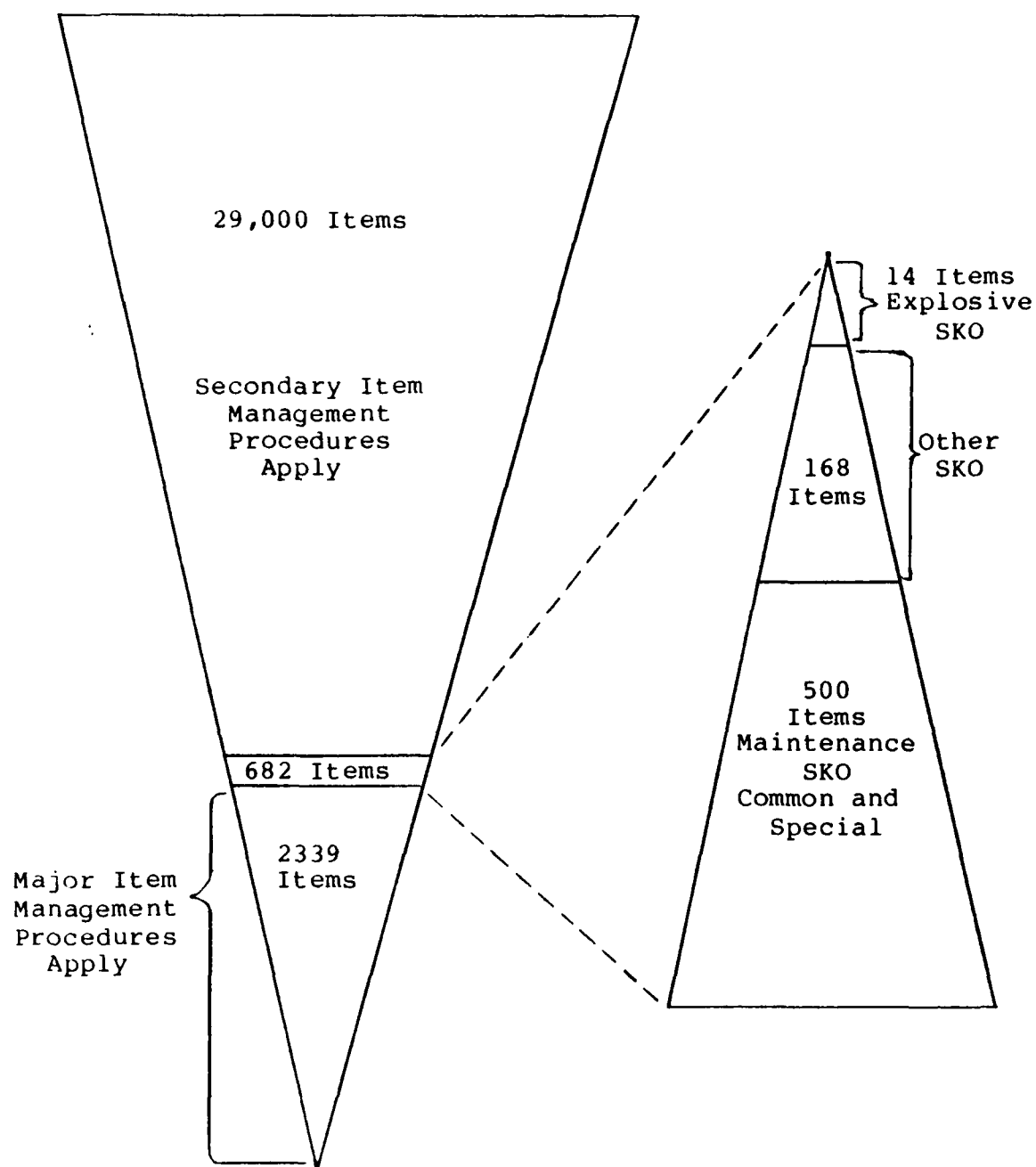


Figure 1. Population of SKO

4. The American language has no word that describes the desired subset of SKO. Unless the type of each SKO item is positively fixed by a readily accessible code, the question, "When is a SKO really a SKO?" will remain. The code itself should relate to the kind of management procedures to be used for the item, and all items assigned the same code should be as nearly homogenous as possible.

5. The automated matching of publications data to catalog data is an awkward, time consuming process. It does not guarantee that somewhere an item exists, which should have a publication either completed or planned, but which has been overlooked.

6. With respect to item nomenclature and unit of issue, catalog data is, at rare times, ambiguous. An item's nomenclature may be "set" while its unit of issue is KT (kit). A requisitioner can quickly determine whether the KT is composed of several sets or of only one, but he should not be required to do so.

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Chapter 7. RECOMMENDATIONS

1. The Catalog Data Activity should reserve a position in the item data record for entry of a code to indicate type of SKO.

a. The coding decision should be made by the Army manager of the item. At least for CL-LIN-SKO, that decision should be coordinated with both the Materiel Readiness Support Agency, where publications records are maintained, and the Equipment Authorizations Review Activity.

b. Although CL-LIN-SKO type codes 1 through 4 were used in this report, the code assignments are arbitrary and may include sets, kits and outfits other than CL-LIN-SKO.

c. Existing CL-LIN-SKO should be assigned Type codes as soon as practical. Items under development are best coded during the normal cataloging routine for new items.

2. The Defense Logistics Agency should prohibit future use of units of issue codes SE, KT and OT if the item's nomenclature describes it respectively as kit or outfit, set or outfit, or set or kit. Routine corrections should take place as other cataloging actions occur, rather than by a concerted, all-out effort.

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APPENDIX A

ACRONYM LIST

AMC	Army Materiel Command
AMCCOM	Armament, Munitions, and Chemical Command
AR	Army Regulation
BOIP	Basis of Issue Plan
CECOM	Communications-Electronics Command
CL	Component List
CTA	Common Tables of Allowances
DA	Department of the Army
DARCOM	Army Materiel Development and Readiness Command
DPSC	Defense Personnel Support Center
EA	Each (Unit of Issue Code)
EMRA	Electronics Materiel Readiness Activity
HQ	Headquarters
JTA	Joint Tables of Allowances
KT	Kit (Unit of Issue Code)
KW	Kilowatt
LIN	Line Item Number
MACOM	Major Army Command
MICOM	Missile Command
MRC	Materiel Readiness Command
MSC	Major Subordinate Command
MTOE	Modification Tables of Organization and Equipment
NSN	National Stock Number
OT	Outfit (Unit of Issue Code)
PAA	Procurement Appropriation, Army
RPSTL	Repair Part and Special Tool List
SB	Supply Bulletin
SC	Supply Catalog
SE	Set (Unit of issue Code)
SKO	Sets, Kits, and/or Outfits

IDA	Tables of Distribution and Allowances
IM	Technical Manual
INDE	Test, Measurement and Diagnostic Equipment
TOE	Tables of Organization and Equipment
TROSCOM	Troop Support Command
USAEARA	US Army Equipment Authorizations Review Activity

APPENDIX B

EXTRACT

AR 310-34, Equipment Authorization and Utilization Policies and Criteria and Common Tables of Allowances, 24 February 1975, with Changes 1 through 6.

* * * * *

Chapter 2, General Policies, paragraph 2-1...

* * * * *

(3) Technical Manual (TM). A TM serves as the authorization document for those components (spares and repair parts), special tools and test equipment which are not required to be type classified separately and which are required for the operation of the end item authorized by the MTOE/TDA/JTA/CTA. Although other items are identified in the TM, such as nonexpendable common tools and test equipment requiring separate type classification, and expendable supplies exempt from type classification, it is for information purposes only. Those nonexpendable tools and test equipment which require separate type classification will be included in and/or authorized by TOE/MTOE/TDA/JTA. The durable common tools, expendable test equipment, and supplies will be included in and authorized by expendable/durable CTA. Also see paragraph 2-5, this regulation.

* * * * *

(8) Supply catalog/component listing (SC/CL). SC/CL contain the listing of components for those end items without TM. The SC/CL use as an authorization document is the same as prescribed for TM. See paragraphs 2-1c(3) and 2-5, this regulation.

* * * * *

2-5. Policies for authorization of end items, components, spares, and repair parts.

a. End items. As a general rule, all non-CTA end items of materiel which have a separate basis of issue plan (AR 71-2), which are separately type classified (AR 70-61), and which are assigned a separate standard LIN (A-Y series except "I", "O", and Y99990) (AR 708-1), will be separately documented in and/or authorized by TOE/MTOE/TDA/JTA. An end item is defined as a final combination of end products, components, and/or materials which is ready for its intended use. Examples are rifle, ship, tank, mobile machine shop, aircraft, common tools, test/measurement/diagnostic equipment (TMDE), and special test/other support equipment designed and developed to perform a specific maintenance

operation on specific assemblies or subassemblies of an end item. The exception to the general rule is an end item, as described above; being applied as a component of a larger end item.

b. Components. There are two types of components--

(1) Components of end items. A component is defined as an assembly or any combination of parts, subassemblies and assemblies mounted together in manufacture, assembly, maintenance, or rebuild. These components will be included in TOE/MTOE/TDA/JTA when separately type classified, assigned a separate standard LIN (A-Y series except "I", "O", and Y99990) and issued as a separate end item. Components not separately type classified/not assigned standard LIN/not issued as a separate end item, are support items and are authorized by the TM, provided that the larger end item is shown as required in TOE and/or is authorized in the MTOE/TDA/JTA and/or the category of maintenance assigned to support the larger end item requires the use of the support items. Schools, training centers, or other activities which require the support items (but not the larger end item) for accomplishment of the mission will obtain MACOM approval for those components costing \$50 and over prior to requisitioning the support items from the appropriate MRC.

(2) Components of equipment assemblages and sets. An equipment assemblage or set is defined as a collection of component items and support items designed to accomplish one general function and is identified, authorized and issued as a single end item. It may be made up of component/support items included in more than one class of supplies; may include separately type classified end items; may include component/support items for which logistic responsibilities are assigned to more than one agency; and may include nonexpendable, durable and expendable component/support items. Examples of equipment assemblages and sets include communications central, pontoon bridge, baking outfit, fire control equipment, tool set, toolkit, or medical assemblage.

c. Spares and repair parts. Components which are authorized for issue for repair and maintenance are identified as spares (recoverable items) and repair parts (consumable items). A spare part is any recoverable component (subassembly or assembly) required for the maintenance or repair of an end item. A repair part is a consumable component (subassembly or assembly) required for the maintenance or repair of an end item. Spares and repair parts required for operation and maintenance of end items or systems are authorized by RPSTL or equivalent document, regardless of relative importance or dollar value, provided that the end item is shown as required in TOE and/or is authorized in the MTOE/TDA/JTA and/or the category of maintenance or training mission assigned to support the end item requires the use of the spare/repair parts.

2-5.1. Policies for authorization of end items supporting assemblages and sets of equipment.

a. General. For the purpose of this paragraph, the following are the types of end items which are authorized separately or are included as components of assemblages. Also see figure 2-1.

(1) Major end item. This type is identified in SB 700-20 as Supply Class VII. The arabic numeral 7 under columnar heading SC denotes the item is categorized as a major end item.

(2) Secondary end item. This type (excluding repair parts) is identified in SB 700-20 as Supply Class II and Supply Class VIII. The arabic numerals 2 and 84 denote the items are other than major/principal and are included in TOE and authorization media.

b. Policies.

(1) The authorization of both major and secondary end items to MTOE/TDA/JTA units/activities requires that the items be separately type classified and documented in TOE/MTOE/TDA/JTA.

(2) The inclusion of major and secondary end items as components in assemblages and sets of equipment is governed by the following criteria--

(a) Secondary end items may be included in assemblages/sets of equipment as determined by the materiel developers.

(b) Major end items, defined in para 2-5.1a(1) above, will not be included as components in assemblages and sets. Those major end items under development and considered for inclusion as components in assemblages and sets will be removed, type classified and separately authorized. Those major end items already type classified and included in assemblages and sets as components will be removed and separately authorized (see para e). Exceptions, which would warrant inclusion/retention of major end items as components in assemblages and sets, are limited to the following:

1. Major end item component installation (exclusive of initial installation) and/or removal is so complex that it must be performed at depot maintenance level.

2. Major end item component(s) is (are) the principal item(s) in the assemblage/set configuration and removal will destroy the identity or integrity of the assemblage/set. Examples of such component items are: the rock crusher in the crush screen and wash plant; the fire truck in the firefighting equipment set;

the teletypewriter in the radio teletypewriter set; the switchboard in the central office communications center; the radio or multiplexer in the radio terminal set; the radar surveillance set, the radio received or the radio transmitter in the radar surveillance system, etc.

3. Major end items component(s) is (are) Army avionics equipment in aircraft or communications/electronics equipment in watercraft.

4. Major end item component removal has been exempted by DA. Unique circumstances that substantiate inclusion/retention of major end item components in assemblages/sets must be documented and provided with justification in a formal request for exemption through HQ, DARCOM (USAEARA) to DA. Exemptions will be considered only on a case-by-case basis and will be judged on the merits of the justification.

(3) Managers of sets/assemblages are responsible for programming/budgeting for all PAA components managed by other managers in accordance with section 5, paragraph 2-35b, AR 710-1.

c. Appendix I, AR 310-34. Selected assemblages/sets requiring major end item support are listed in appendix I. Major end items required to support assemblages/sets are identified and listed as authorized with, and as authorized separately, as appropriate. Instructions and format for preparing transactions cards are included in appendix I.

d. Responsibilities.

(1) HQDA. The Deputy Chief of Staff for Operations and Plans has Army General Staff responsibility for approval of policy and of appendix I.

(2) Materiel developers. The US Army Materiel Development and Readiness Command, the US Army Communications Command, the US Army Computer Systems Command, the Chief of Engineers, HQDA, and The Surgeon General, HQDA, will--

(a) During BOIP development (AR 71-2) for new assemblages/sets for which they are responsible, or in which they have component responsibility, assure that only secondary end items and those major end items which meet the criterion stated in b(2)(b) above are included in sets/assemblages.

(b) Assure that all major end items not meeting the criterion in b(2)(b) above are excluded/removed from assemblages/sets. If assemblage/set and component managers are not the same, the component item manager is responsible for coordinating removal actions with the assemblage/set manager. The inclusion

or retention of any major end item in an assemblage/set requires justification and written agreement between the commodity managers involved and HQDA approval.

(c) Assure that assemblages/sets with supporting major end items are listed in appendix I.

(d) Update appendix I semiannually and submit final manuscript to HQDA (DAMO-FDP) by 10 June and 10 December for approval and publication.

(3) Combat developers. The US Army Training and Doctrine Command as the Army's principal combat developer and user representative is responsible, under provisions of AR 71-2, for--

(a) Developing BOIP for assemblages and sets and for those major end items excluded therefrom and authorized separately.

(b) Advising HQDA when the items have been applied to TOE.

e. Additional guidance.

(1) If the quantity of a secondary end item component of an equipment assemblage or set would be subject to fluctuation on the basis of personnel or other equipment in the TOE/TDA, the materiel developer will not include the component in the equipment assemblage or set. In lieu thereof the materiel developer will identify the item in the set or assemblage supply catalog as a "used with but not part of" item, and the TOE/MTOE/TDA/JTA proponent will document the entire quantity of the item in the TOE/MTOE/TDA/JTA as a separate line item.

(2) When major end items are removed from assemblages and sets, the following actions are required--

(a) Change in the generic description of the assemblage/set to indicate those end items removed.

(b) Assignment of new LIN and NSN to identify the set or assemblage less the removed major end items because the removal of these items changes the functional capability of the assemblage.

(c) Type classification of the removed end items if necessary.

(d) Submission of materiel status reports in accordance with AR 70-61.

(c) Inclusion in the next change or revision of the TOE/MTOE/TDA if the items are required to support the assemblage or sets of equipment. HQDA-controlled items require separate authorization under AR 310-49 prior to documentation in TOE (unless included in TOE) or TDA. See paragraph 2-19.

(d) Proponents of TOE/MTOE/TDA/JTA, when developing or reviewing such documents, will consider the use of lesser numbers of support items through pooling of assets, use of larger support items (i.e., one 10KW generator in lieu of two 5KW generators), and, for TDA organizations, the use of commercially available power instead of standard generators.

(4) Proponents of supply catalogs and other appropriate publications for assemblages and sets of equipment will identify major end items excluded removed therefrom with the note "used with but not part of."

6. Authorization of nonexpendable, durable, and expendable items. See paragraph 2-4h.

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GIST

 AMSAA	TITLE Sets, Kits and Outfits (SKO) Management Concepts Review (Phase I)	
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THE PRINCIPAL FINDINGS and recommendations of the work reported herein are as follows:

1. The total population of sets, kits and outfits comprises 29,000 secondary items, excluded from the Management Concepts Review; 2,339 major items, the components of which are documented by Technical Manual, also excluded from the review; and, 682 items, the components of which are documented by Supply Catalog/Component Listing. This latter group can be categorized into four types: explosive SKO, 14 items; common maintenance SKO plus equipment-oriented maintenance SKO, about 500 items; and, other SKO, about 168 items. It is this group of 682 items which is targeted for improved management.

2. The principal recommendation is that a type code be assigned to all items for which documentation by Supply Catalog/Component Listing is appropriate, and that future management procedures be based upon type.

THE MAIN ASSUMPTION was that sets, kits and outfits, the components of which are documented by Supply Catalog/Component Listing included all items for which such documentation was proper and did not include any items for which documentation by Technical Manual was proper.

THE PRINCIPAL LIMITATION was the jargonistic use of the acronym SKO among personnel working with it, leading to expressions such as "real SKO" and "bona fide SKO." In this jargon, SKO refers not to the whole population of sets, kits and outfits, but only to that subset whose components are documented by Supply Catalog/Component Listing. There is no word in the American language with which to replace the jargon.

THE SCOPE OF THE STUDY is to extract from catalog data a listing of SKO and to develop complete, fully descriptive, and restrictive definitions for sets, kits and outfits.

THE STUDY OBJECTIVE was to develop strict and specific categorizations for sets, kits and outfits; and to identify SKO now in the Army inventory and in the development process.

THE BASIC APPROACH was to extract from the Army Catalog Logistics Data Base all Army-used items whose nomenclature or whose unit of issue identified them as being sets, kits or outfits. This was subsequently matched by National Item Identification Number to sets, kits and outfits which were documented by Supply Catalog/Component Listing.

THE REASONS FOR PERFORMING THE STUDY were to determine some methodology for classifying sets, kits and outfits into categories so that new common management techniques can be developed and applied on that basis.

THE STUDY SPONSOR was the US Army Materiel Command, Directorate for Supply, Maintenance, and Transportation.

THE STUDY EFFORT was directed by Mr. Royce Walz, Directorate for Supply Maintenance, and Transportation.

COMMENTS AND QUESTIONS may be directed to AMSAA, ATTN: AMXSY-LLSO, Mr. W. H. Brisendine

END

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