CHAPTER 3

STORAGE PROCEDURES

Section 1. RECEIVING

3-101. General

a. Prompt and accurate processing of receipts is a prime requisite of an effective supply system. The details of receiving operations are influenced by the types of supplies to be handled, distance to the storage location, type of MHE available, and the physical characteristics of the storage installation.

b. Although the basic principles of receiving are universally applicable wherever supplies are received for storage and subsequent distribution, receipts of classified, pilferable, and sensitive items (including small arms) require special handling and controls over and above the basic receiving principles. Section 8 of this chapter delineates the controls necessary to process these type materials.

3-102. Planning and Coordinating the Operation

a. The planning of receiving operations requires complete coordination among the storage activities responsible for the different phases of the operation. This is particularly true for items with a security classification. The proper evaluation of advance information prior to actual material receipt is of utmost importance to ensure that appropriate preliminary steps are taken to receive the supplies as efficiently and economically as possible. Any correspondence concerning due-in receipts should be considered in planning. Prepositioned material receipt documents, purchase orders, contract schedules, advance bills of lading or other shipping documents are types of data used to determine approximate arrival dates and type and quantity of supplies. Pertinent information on significant due-in receipts must be given to personnel concerned with warehousing, transportation, preservation, packing, and inspection.

b. Planning and coordinating promote effective storage space utilization, efficient assignment of labor and equipment, and recognition of receipts requiring special handling or processing. Normally it is not recommended practice to reserve specific storage space for expected due-ins. However, through advance planning general determinations can be made on where receipts will be stored.

3-103. Spotting and Control of Carriers

a. Although current directives require that the consignee be notified prior to the shipment arrival, rail cars and trucks may arrive with little or no advance notice.

b. Upon notification of or arrival of a shipment the carrier must be directed to the desired unloading site. This action is called spotting. Proper spotting results in-

(1) Straight line flow so that minimum travel distances and handling actions will be necessary from the carrier to the receiving area or storage location.

(2) Continuous flow and proper balance between labor and equipment. Lost motion and waiting time for labor and equipment must be held to a minimum.

(3) Localizing the unloading operation hence supervision is easier. Also, the use of shorter hauls may reduce requirements for MHE.

c. Truckloads or carloads of a single item or other large quantities of an item should be spotted for unloading at the warehouse where the material will be stored, This should also be done for heavy or large cube items not suitable for handling in a central receiving area. Some carrier tariff provisions provide for multiple deliveries at the receiving installation. Such a provision should be used when practical to position material near the final storage location, ."

d. Carloads or truckloads of mixed material, containers with more than one line item, parcel post itmes, returns from local shop facilities and using organization can normally be spotted and processed more efficiently through a central receiving activity.

e. Unloading operations to release the carrier must be closely monitored as there are specific periods for carrier holding without a penalty charge. These periods are called free time. If the carrier is retained beyond the authorized free time, time in excess is subject to demurrage or detention charges.

(1) Rail car demurrage charges are assessed for the detention of freight cars on the basis of a specified amount per car-day. Shippers or consignees who detain cars for loading, unloading, or furnishing orders to the carriers beyond the free time allowed by carrier tariffs are required to pay the lawfully published charge. Specific questions related to rail car demurrage should be referred to the installation transportation officer to ensure that current charges and rules are considered.

(2) Truck detention rules and penalty charges vary with individual trucking concerns and locations. Specific questions must be referred to the carrier freight traffic office.

3-104. Unloading Operations

a. Each unloading operation requires planning and on-the-spot supervision. The unloading of supplies should be compatible with procedures involved in tally-in and inspection of the receipt. In general, the mechanics of unloading supplies will vary according to the type of carrier, type and weight of supplies, type of unloading facility, and MHE available.

b. The general unloading sequence described below is applicable to supplies received by rail car or motor truck.

(1) Before a sealed rail car or truck is opened, the seal must be checked for condition and serial number. If the seal is broken or missing, or if in the case of exclusive use of van shipments and rail car shipments the serial numbers do not agree, an annotation should be made on the documentation and in the case of sensitive cargo, the transportation office and security office notified prior to unloading.

(2) Rail car doors are opened by a device similar to that illustrated in chapter IV, section 2. Federal safety regulations specifically prohibit the use of forklift trucks to open rail car doors even when the doors are equipped with "pockets" to provide for this type of operation. Truck doors are opened manually. by the truck driver. Doors must always be opened so that personnel are protected against falling containers or items.

(3) A preliminary inspection should be made when the carrier's equipment is opened. If there is obvious evidence of shortage or damage, the unloading operation should be suspended, if practical, pending inspection by the carrier's representative.

(4) The method of entry into the carrier for unloading depends upon the type of carrier, type of material received and the physical characteristics of the receiving area. If unloading is to be accomplished at a dock level warehouse platform, abridge plate or some type of mechanical or hydraulic dock leveler may be used to permit entry of unloading equipment into the carrier. Extensive conveyors may also be used at dock level warehouse platforms. If the warehouse platform is at ground level, a portable platform may be used to aid in unloading by forklift truck. Also, a portable ramp may be used to allow entry of a forklift truck into the carrier.

(5) Supplies which will move to the storage location either directly from the carrier or from the receiving area should be palletized, while in the carrier or as the receipt is offloaded from the carrier to the extent practicable.

a. In placing containers on pallets within the carrier, the aim must be toward maximum palletization (or unitization) so that the unloading operation can be accomplished as rapidly and efficiently as possible. During this stage of the operation the supervisor should make certain that the appropriate pallet pattern is used. (See pallet pattern selection table (table 3-1) and pattern outline table (table 3–2)).

b. The pattern should be reversed on successive layers so that containers will interlock and be tied together. Protection of personnel, consideration of container strength, the size of the door opening, and capacity of equipment affect the size of the pallet load.

c. Palletized containers should be positioned so that the identification markings are visible at the outer rows of the pallet load. Proper palletization upon receipt permits warehousing with a minimum of delay.

(6) A forklift truck must have a limited collapsed mast height to enter a conveyance to remove the supplies. Generally, a forklift truck with a capacity of 2,000 or 4,000 pounds and a collapsed mast height of 83 inches or less can be used for unloading rail cars, trucks or interrnodal containers. However, the floor strength of carrier equipment must be checked to assure that the floor can support the equipment and load. Forklift trucks should not be used in semi-vans unless the tractor is in place or suitable jacks are in place to prevent the van from upending. Because of size limitations, a 4,000-pound forklift truck with a collapsed mast height of 91 inches is the largest that can normally be used for direct rail car unloading, and a 4,000-pound forklift truck with a collapsed mast height of 83 inches is the largest that can be used for direct motor truck unloading.

(7) Intermodal containers on chassis, rail cars or on the ground can be offloaded with the same MHE used to unload material from trucks. In general, containers are removed from rail cars before contents are removed.

(8) Figures 3-1, 3–2, and 3–3 depict various workable methods of unloading and movement of supplies.

3–105. Checking Incoming Material

a. Tallying incoming material. Accurate checking for number of containers and apparent darnage to material is a basic receiving action. Material should be tallied concurrently with the unloading operation (see para 3-104). The inbound receipt document is generally used as the tally record. When not available, a blank copy of the receipt document normally used may be used to record and tally. When a blank copy is used for record and tally purposes, all available information pertaining to the receipt will be inserted in the appropriate portions of the form. The tally count maybe made by lining through the numbers around the border of the inbound document and circling the number of missing packages; or it may ba accomplished by the stroke tally method or by recording of container quantities using the reverse side of the document as a work sheet. The quantity of supplies actually unloaded and accounted for must be reported as received. In many instances, full truck and freight car shipments of items packed in uniform quantities may be checked by the pallet load as they are removed from the conveyance. This method of checking is particularly advantageous for all unloading operations where the unit load method has been used by the shipping activity.

b. Inspecting supplies.

(1) Once unloading has begun, damaged containers should be set aside for examination by technically qualified personnel. In addition to these inspections, a Packaging Improvement Report (DD Form 6) should be made for supplies that have been improperly preserved, packed or marked as defined in AR 700–58/NAVSUPINST 4030.29/AFR 71-13/MCO P4030.29A/DSAR 4145.8 Discrepancy in Shipment Confirmation (DISCON) (SF-363) and/or Discrepancy in Shipment Report (short title DISREP), (SF-361) will be prepared to report over, short, astray, damaged freight or other type transportation discrepancies as defined in AR 55-38/NAVSUPINST 4610.33B/AFR 75–18/MCO P4610.19C/DSAR 4500.15 (RCS MTMC-54 (RI)). Photographs are extremely valuable and should be used when details of the discrepancy cannot be adequately explained or can be more fully supported by such documentation. Additional inspection will be performed at the discretion of the Service/Agency concerned.

(2) The inspection-at-destination directives of the military services dictate whether a complete or a sample inspection is required.

(3) If point of acceptance is at source, exterior containers except for classified items and small arms need not be opened unless there is evidence of tampering, damage during transit, or other indications that warrant such action. Classified items and small arms will require a 100 percent verification of quantity received by opening containers and physically viewing container contents (see sec. 8 of this chap.). Similarly, sealed inner containers need not be opened unless there is justifiable reason.

(4) Repackaging and marking of receipts may be necessary if received in damaged containers or

Table 3-1. Pallet pattern selection table (40 x 48 inch pallet)

INCHES IN LENGTH

INCHES IN WIDTH

USE OF TABLE

1. Determine width and length of container to nearest ½ inch.

2. Locate the length of container at the top, and width at left side of index chart, the container pattern number will be found at the intersection of two columns.

3* Tie load by reversing pattern for each tier.

4. Height may be substituted for width when the containers are of sufficient strength to withstand superimposed loads, and where such placement will cause no adverse effect in the shipment or storage of the materiel.

Table 3-1.-Continued

INCHES IN LENGTH

INCHES IN WIDTH

	22	22½	23	23½	24	24½	25	25½	26	26½	27	27½	28	28½	29	29½	30	30½	31	31½	32	32½	33	33½	34	34½	35	35½	36	36½	37	37½
6	43	43	56	56	56	56	56	56	56	81	81	81				10	10	10	70	70	70	70	70	70	70	55	55	55	55	55	55	184
6½	56	56	56	56	56	56	56	56	56			10	10	10	10	10	10		80	80	80	80	55	55	55	55	55	55	55	55	69	69
7	41	41	33	33	33	93	93	93	93	10	10	10	10	10	10	10	80	80	80	80		54	54	54	54	54	54	54	54	54	69	69	69
7½	40				10	10	10	10	10	10	10	10	10												68	68	68	68	68	60	60	50
8	40	10	10	10	10	10	10	10	10	10	10														68	68	68	68	68	50	50	50
8½	10	10	10	10	10	10	10	10	10									68	23	83	23	83	83	23	23	83	50	50	50	50	50	50
9		36	36	36	36	36	36	92	92														35	35	53							
9½	36	36	36	36	92	92	92	92	92												35	35	35	35	53							
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10½	92	92	92	92	92	92	92	92	92						35	35	35	35	35	35	35								31	31	31	31
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11½									35	35	35	35	35	35	35					79												
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13			35	35	35	35	35	35	35			79	79	79	79	79	79									8	8	8	8	8	8	8
13½	32	32	32	32	32	32	32	91	91														8	8	8	8	8	8	8	8	8	8
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15½			3	3	3	3	3	3	3																							
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16½	3	3	3	3	3	3	3	3	3																				94	94	94	94
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18							6	90	90															1	1							
18½						6	90	90	90														1	1	1							
19				6	6	90	90	90	90											1	1	1	1									
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20		6	6	90	90	90	90	90	90								1	1	1	1	1											
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Table 3-1.-Continued

INCHES IN LENGTH

INCHES IN WIDTH

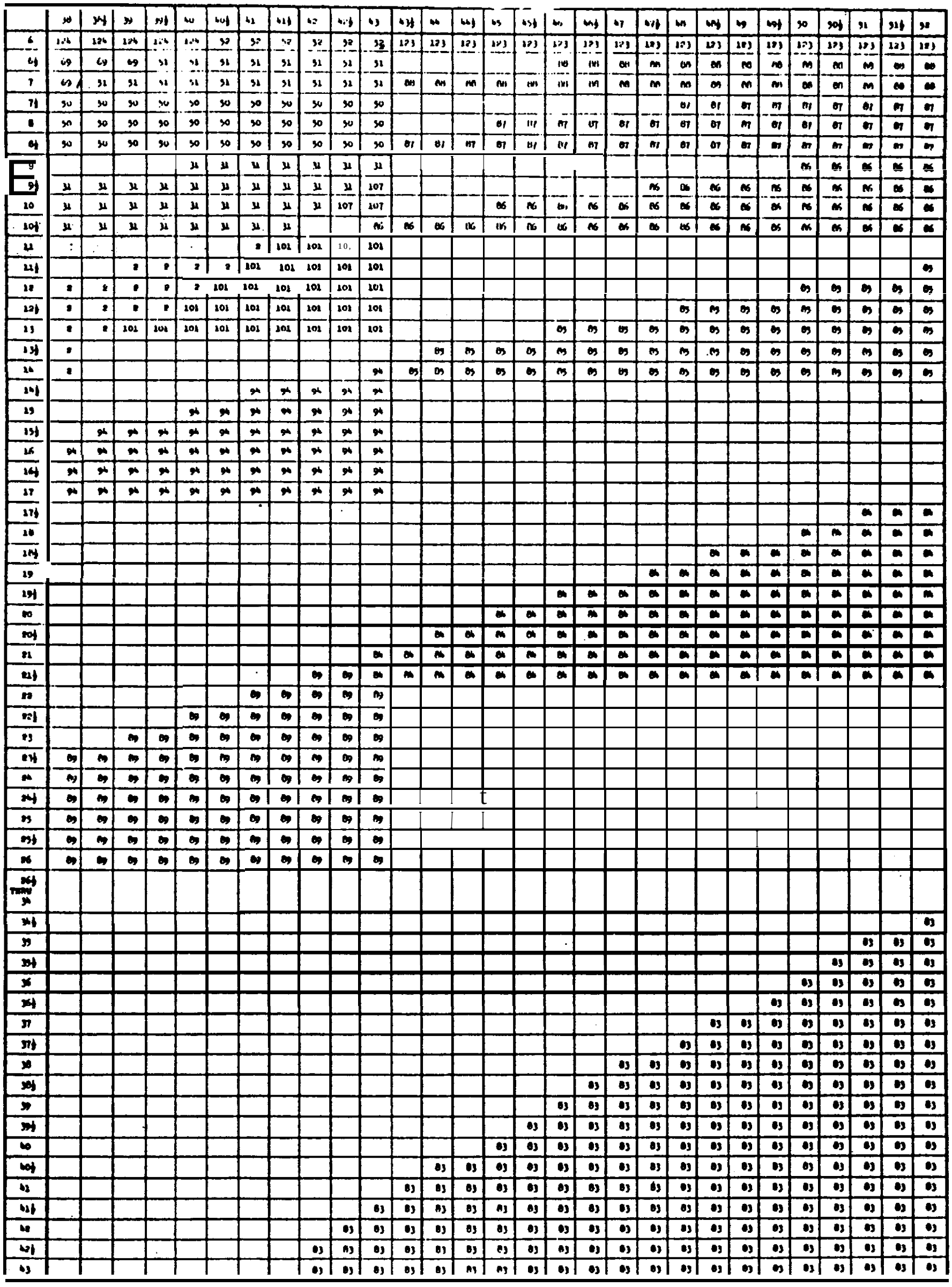
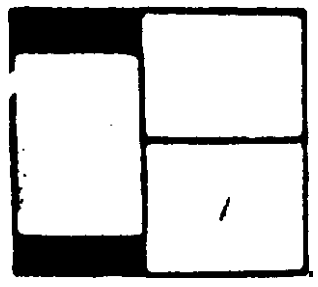


Table 3-2. Pallet pattern outline table (40 x 48 inch pallet)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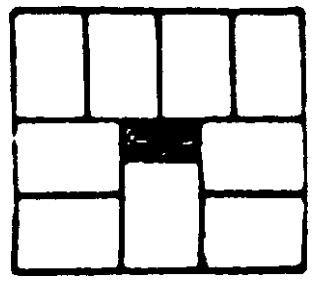
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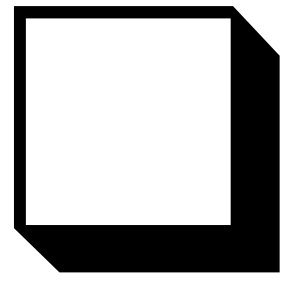
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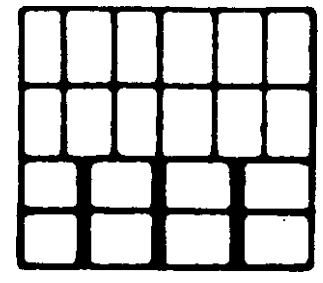
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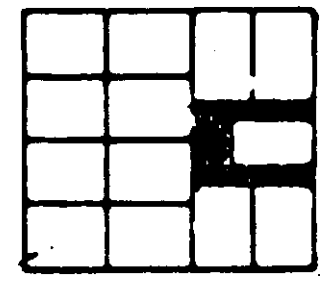
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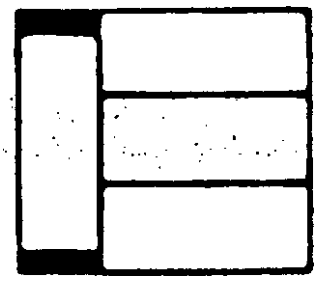
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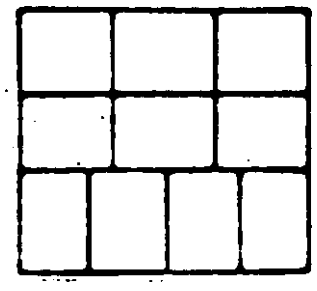
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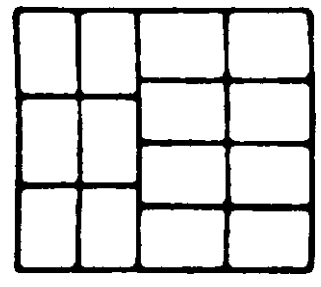
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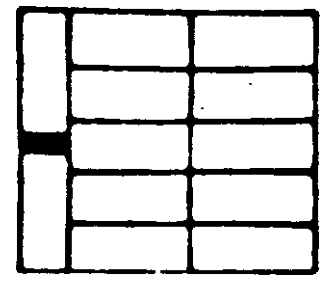
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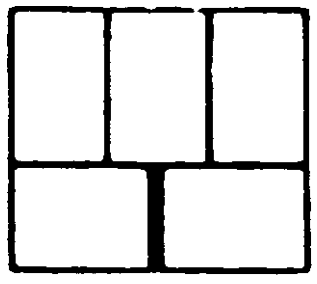
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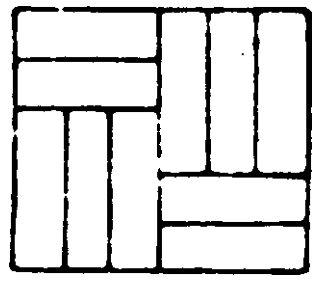
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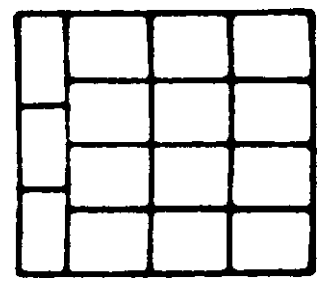
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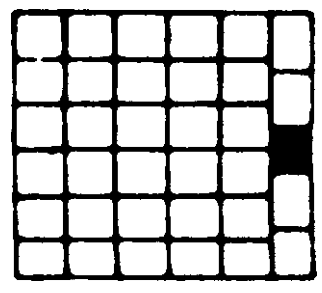
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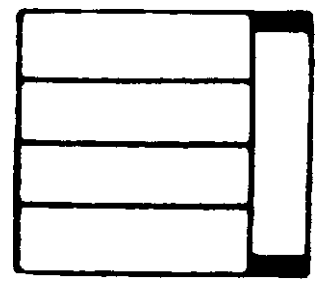
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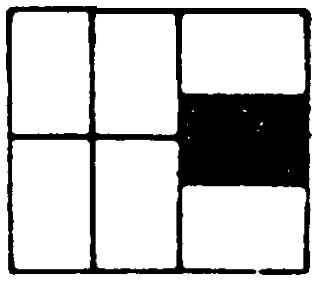
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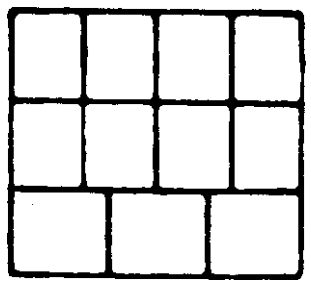
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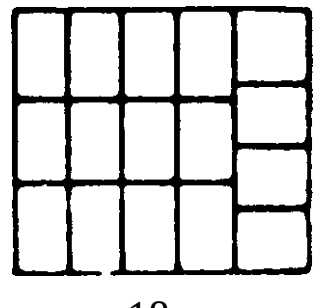
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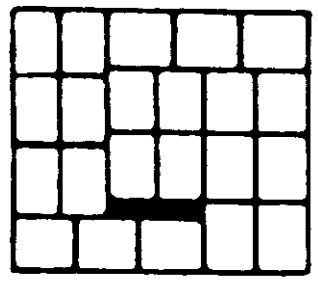
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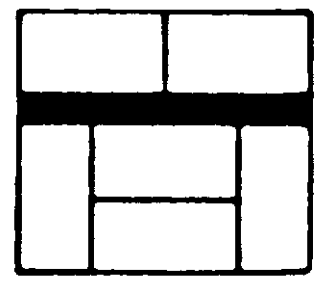
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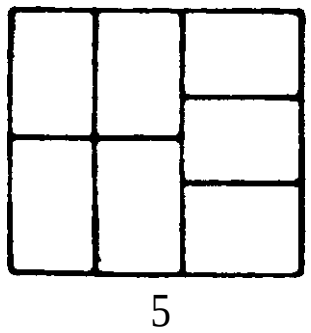
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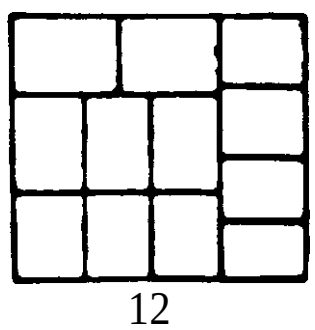
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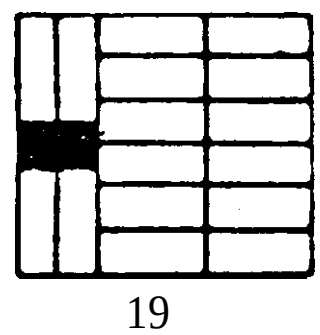
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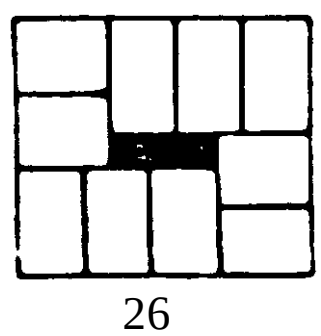
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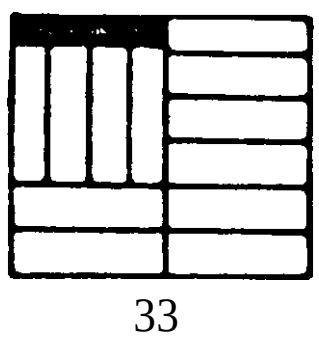
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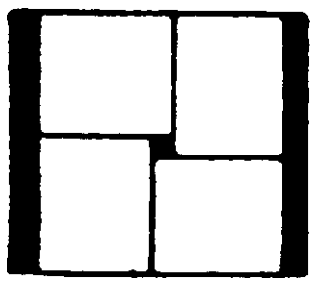
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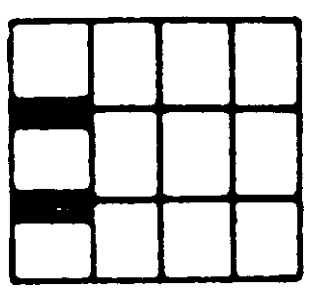
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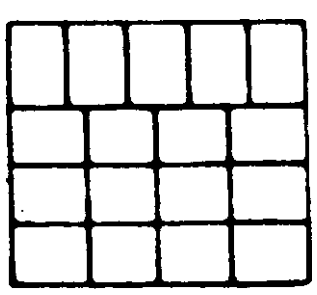
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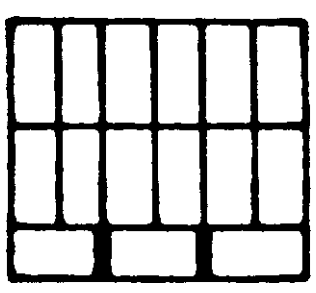
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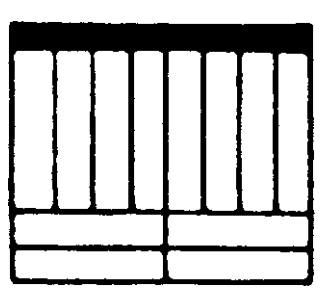
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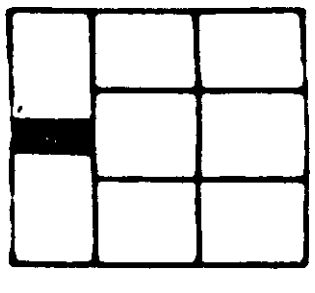
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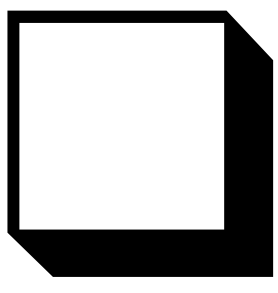
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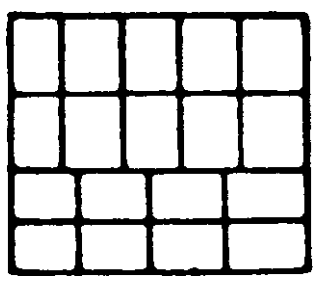
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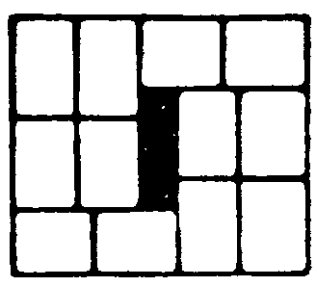
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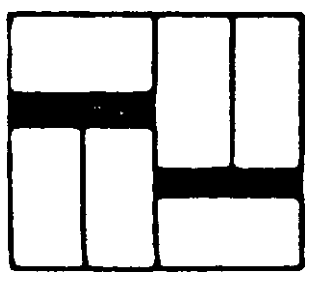
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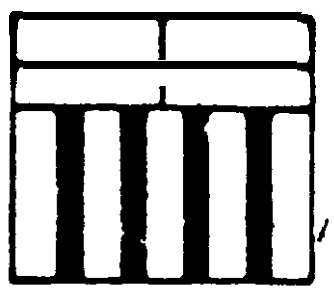
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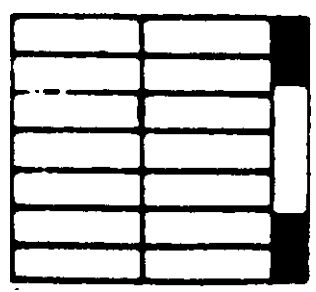
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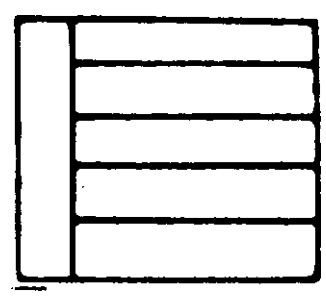
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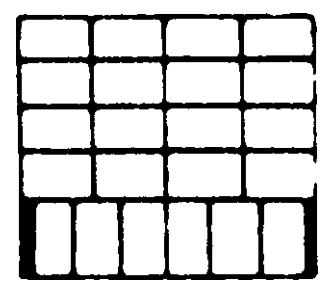
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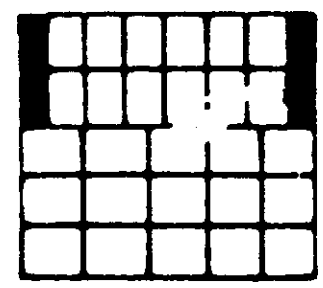
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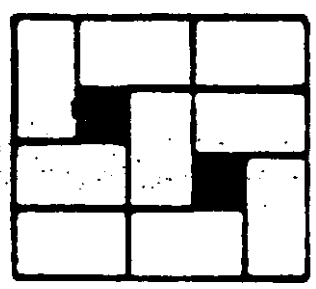
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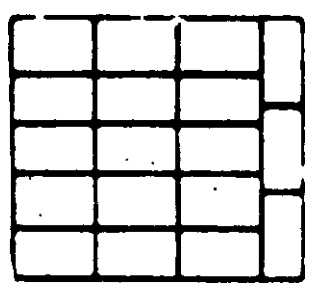
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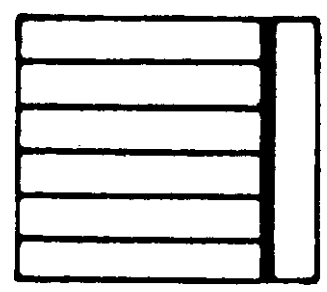
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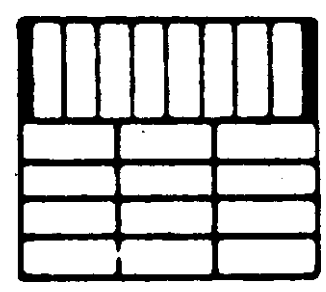
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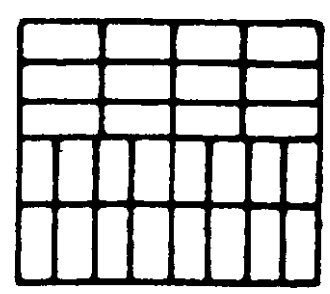
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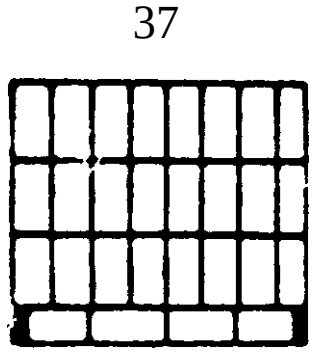
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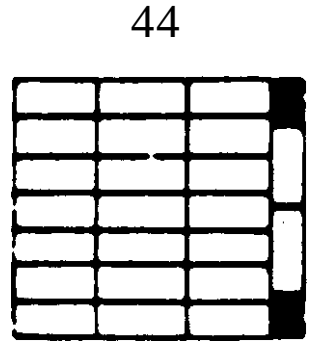
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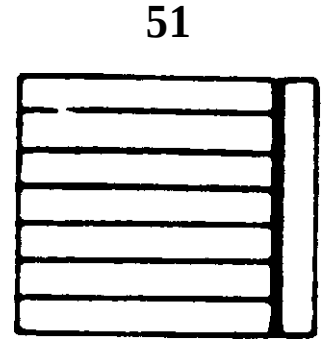
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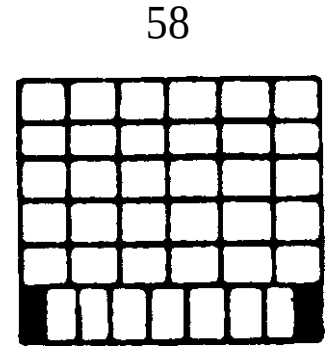
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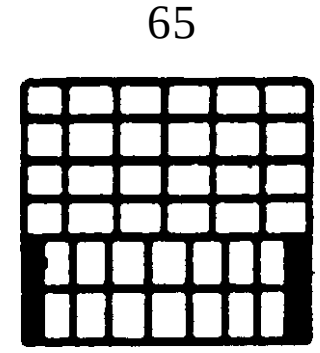
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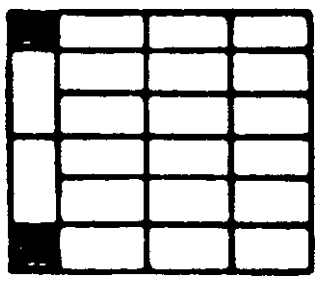
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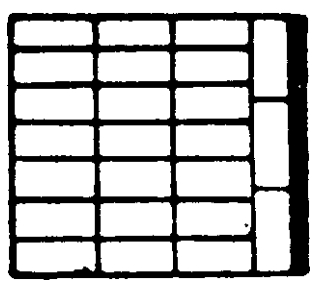
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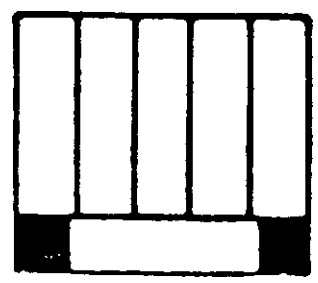
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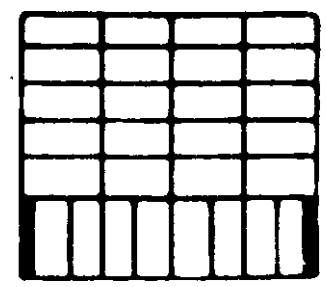
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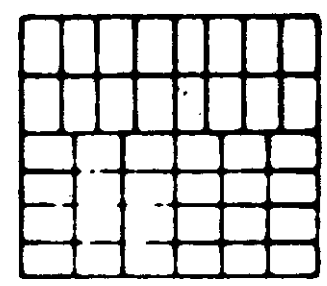
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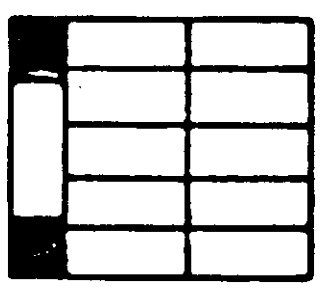
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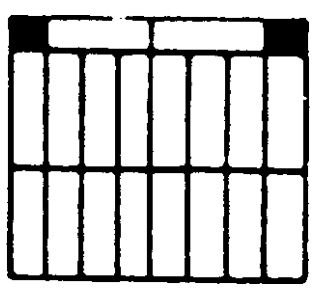
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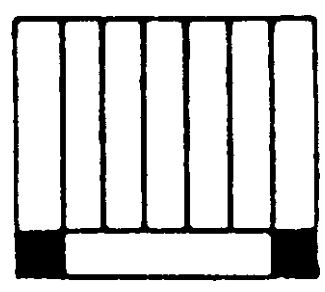
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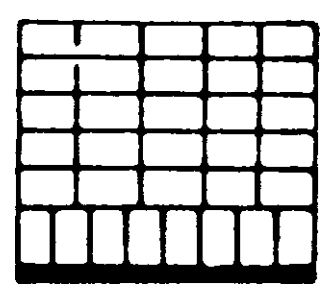
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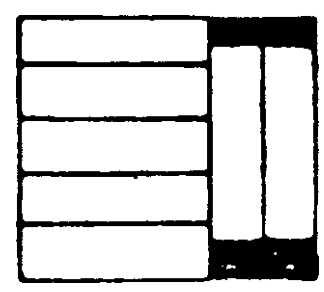
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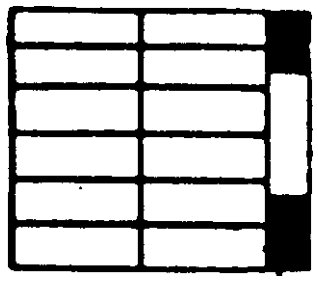
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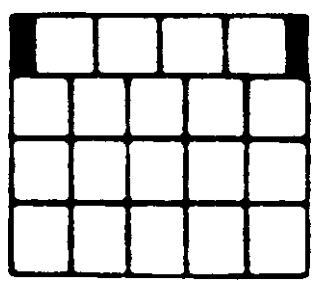
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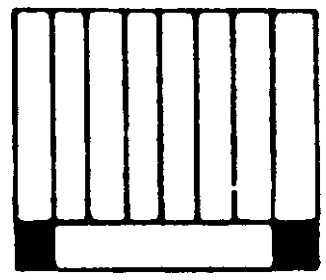
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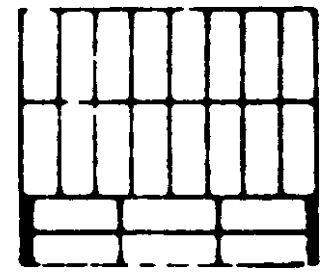
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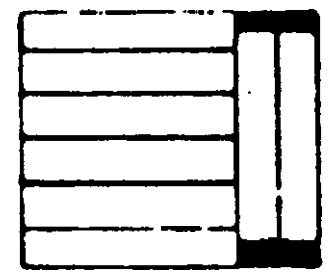
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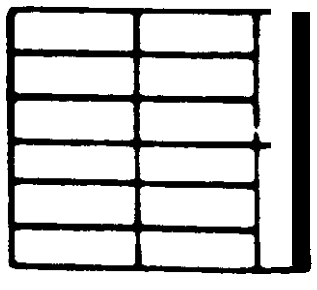
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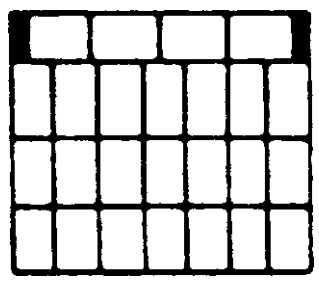
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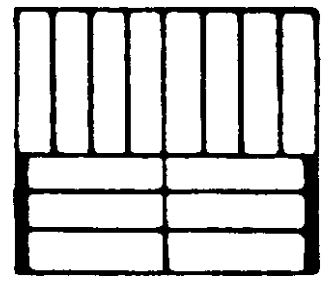
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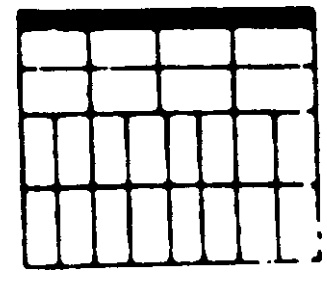
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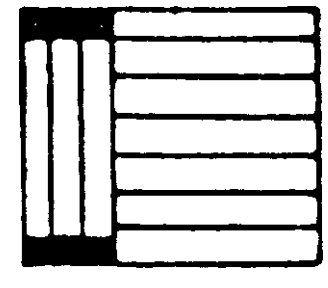
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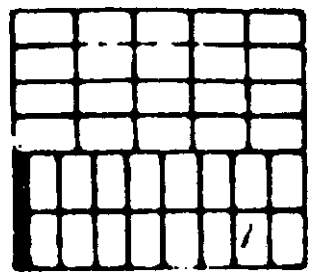
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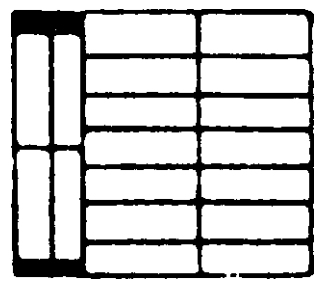
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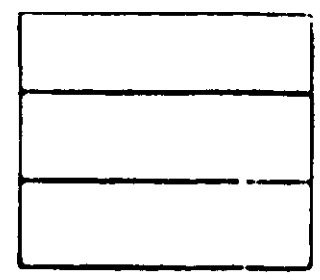
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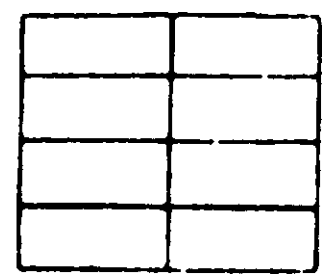
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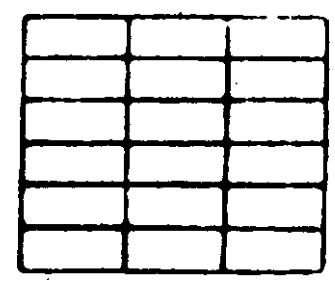
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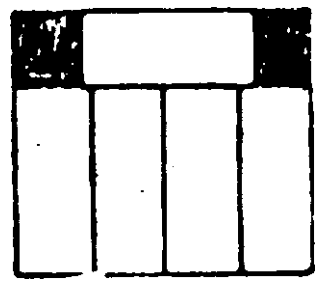
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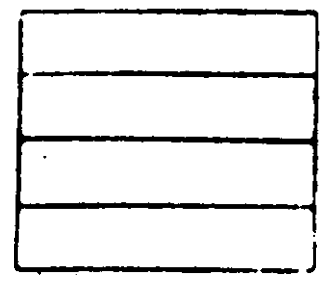
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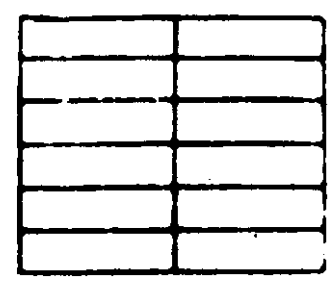
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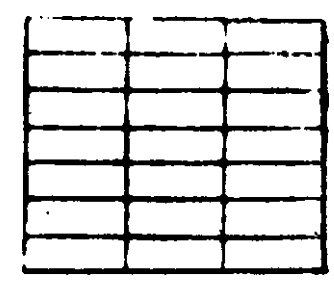
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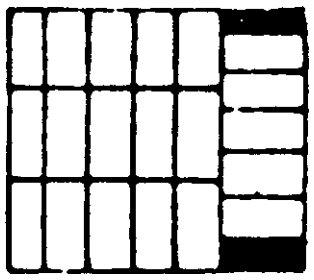
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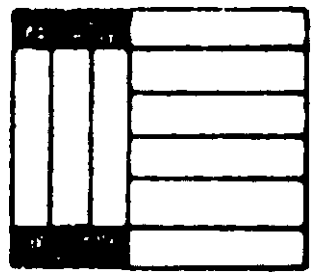
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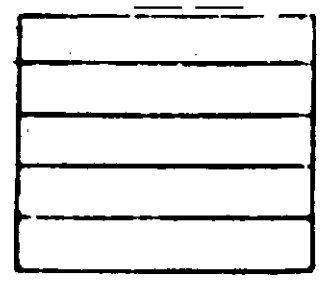
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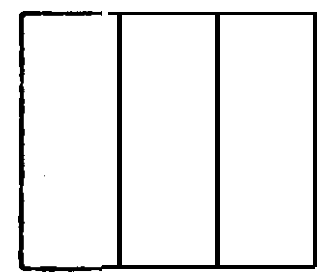
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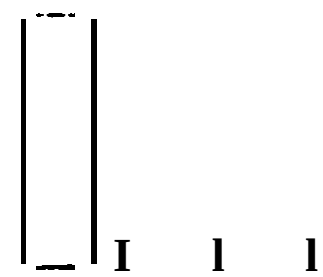
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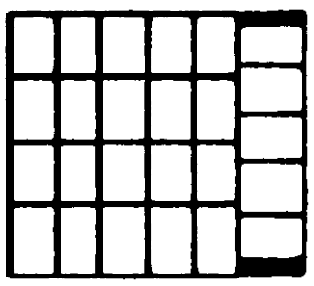
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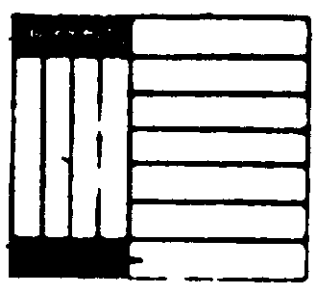
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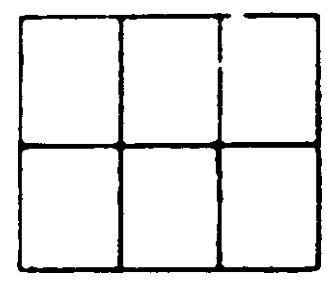
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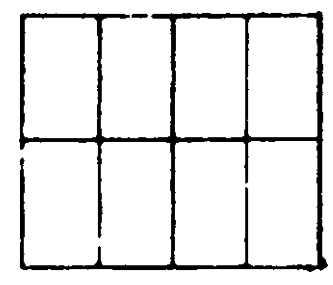
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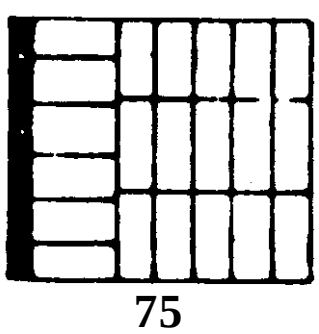
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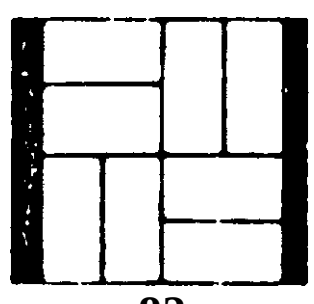
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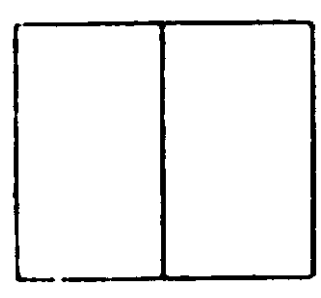
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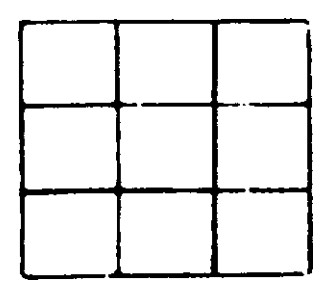
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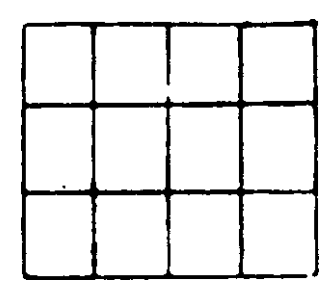
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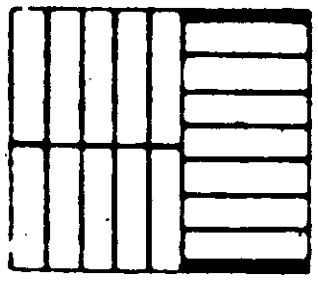
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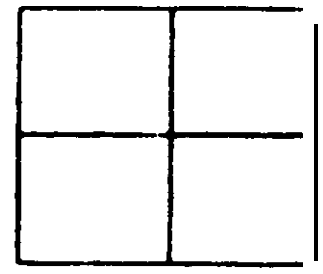
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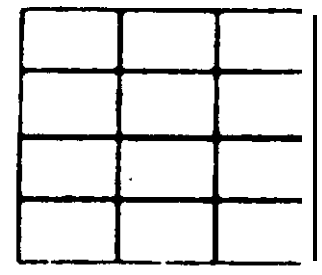
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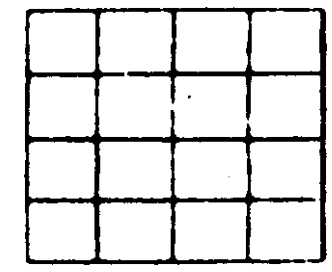
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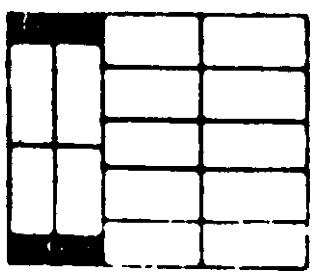
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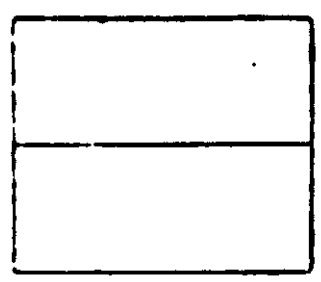
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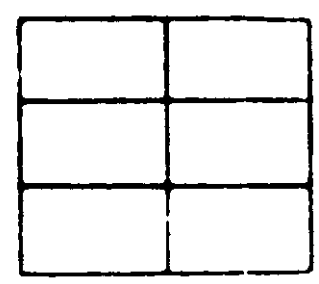
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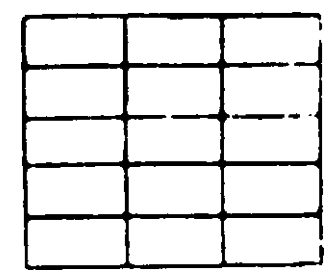
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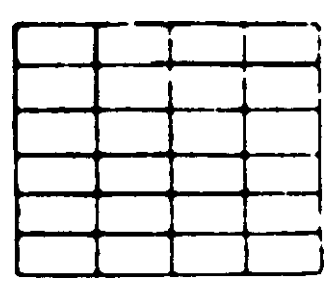
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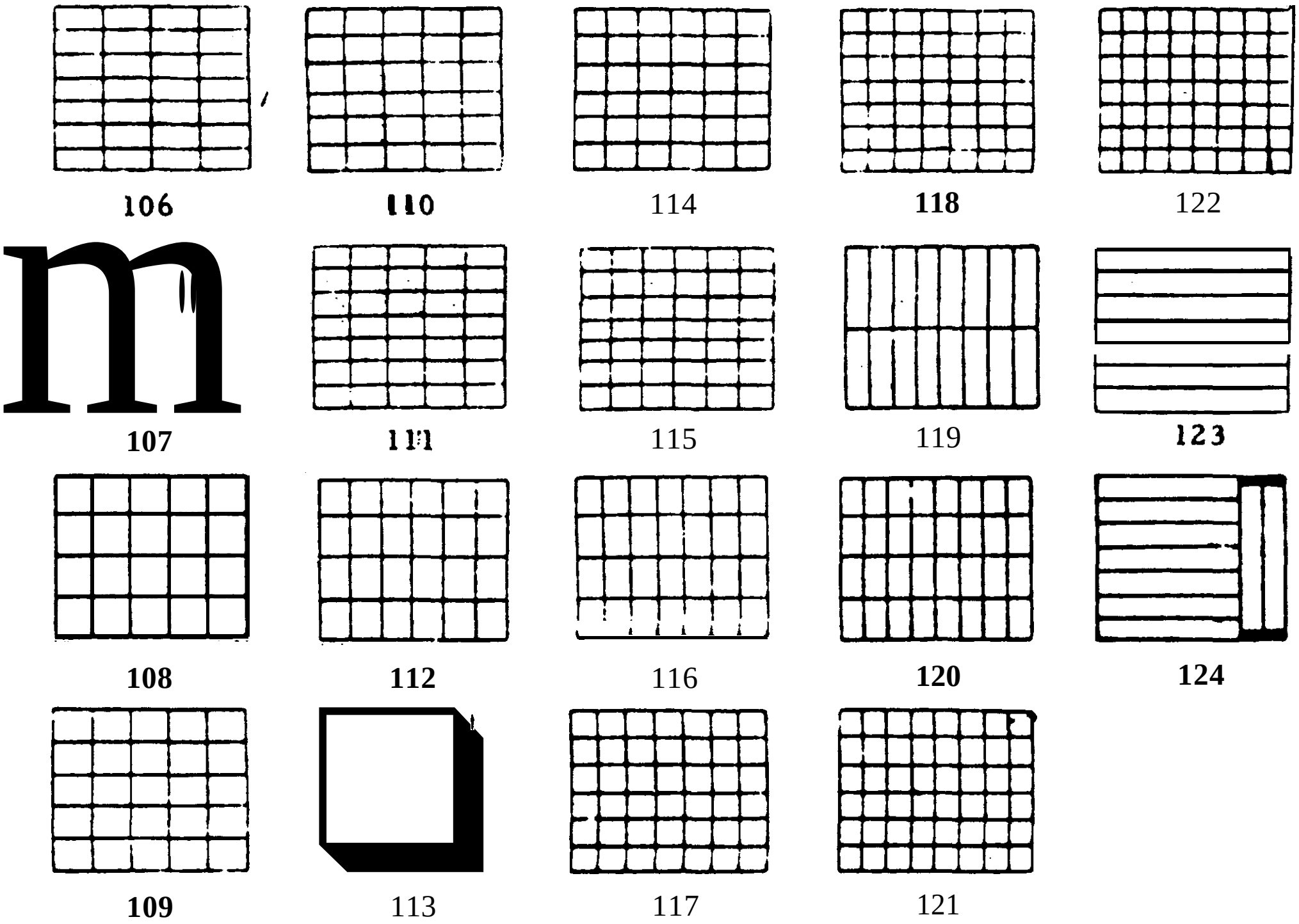
Table 3-2.-Continued

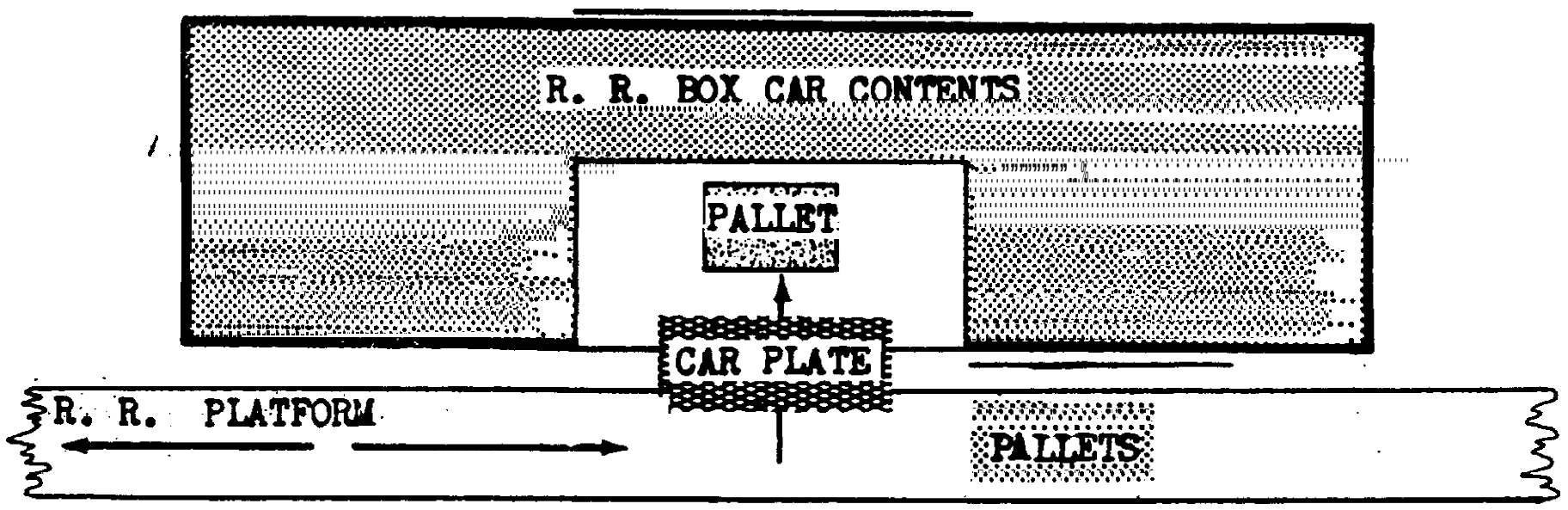


in containers unsuitable for proper storage. Opening and repacking may also be required if there is any question concerning the contents of the container. When containers of radioactive materials are damaged in shipment, subsequent actions must be directed by a qualified Radiological Protection Officer.

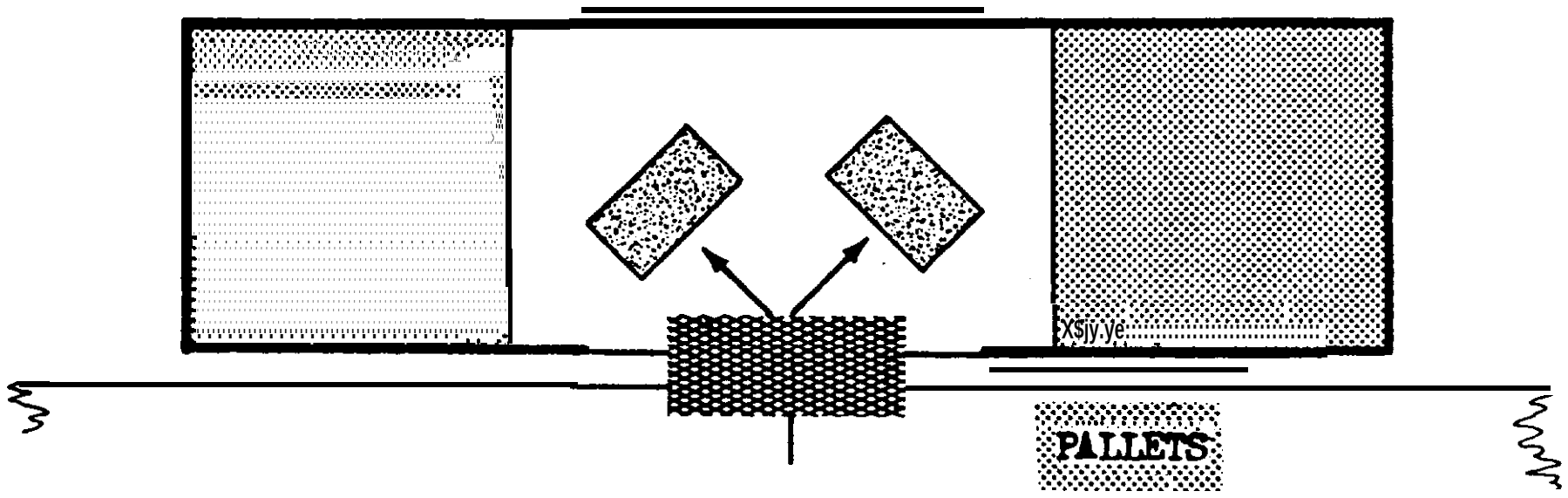
3–106. Receipt Documents

a. Control. The control of receipt documents is basic to effective receiving operations. It is essential that controls provide appropriate measures to avoid confusion in document handling and also provide timely status information. Such controls can be established through the use of document registers, a file of document suspense copies, or by. use of microfilming techniques. Manual *or* computer methods may be used to develop and maintain the control system. A daily review of file make-up will be made to assess delays in the processing of receipts. The control system may be expanded to serve as a proof of storage tool or as a base for quality control samples on receipt actions. The specific type and extent of control will be determined by the appropriate service or agency.

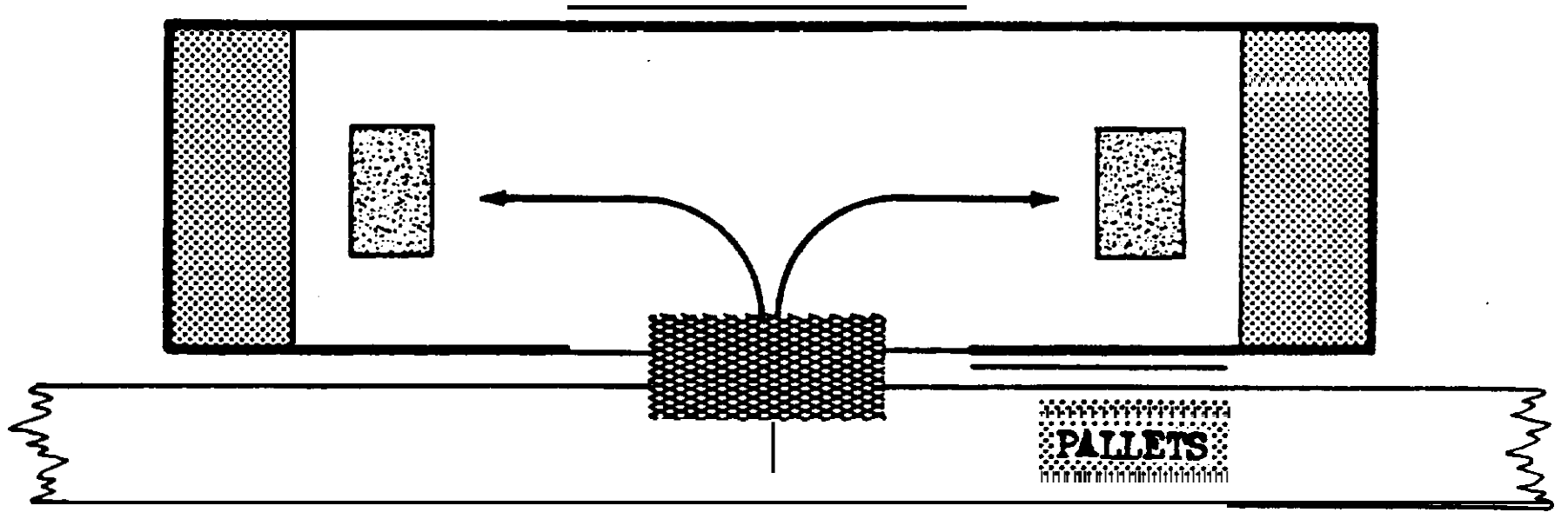
b. Processing. The flow of documents in the re-



A. AFTER DOORNAY HAS BEEN BROKEN, PALLET SHOULD BE PLACED IN A STRAIGHT FORWARD POSTION.



B. AFTER SUFFICIENT SPACE IN CENTER OF CAR HAS BEEN CLEARED, PLACE PALLETS *AT* 45° ANGLE.



C. AFTER CENTER THIRD OF CAR CONTENTS HAS BEEN UNLOADED, PLACE SUBSEQUENT PALLETS AT 90° ANGLES.

Figure 3–1. Unloading and movement to storage using forklift truck.

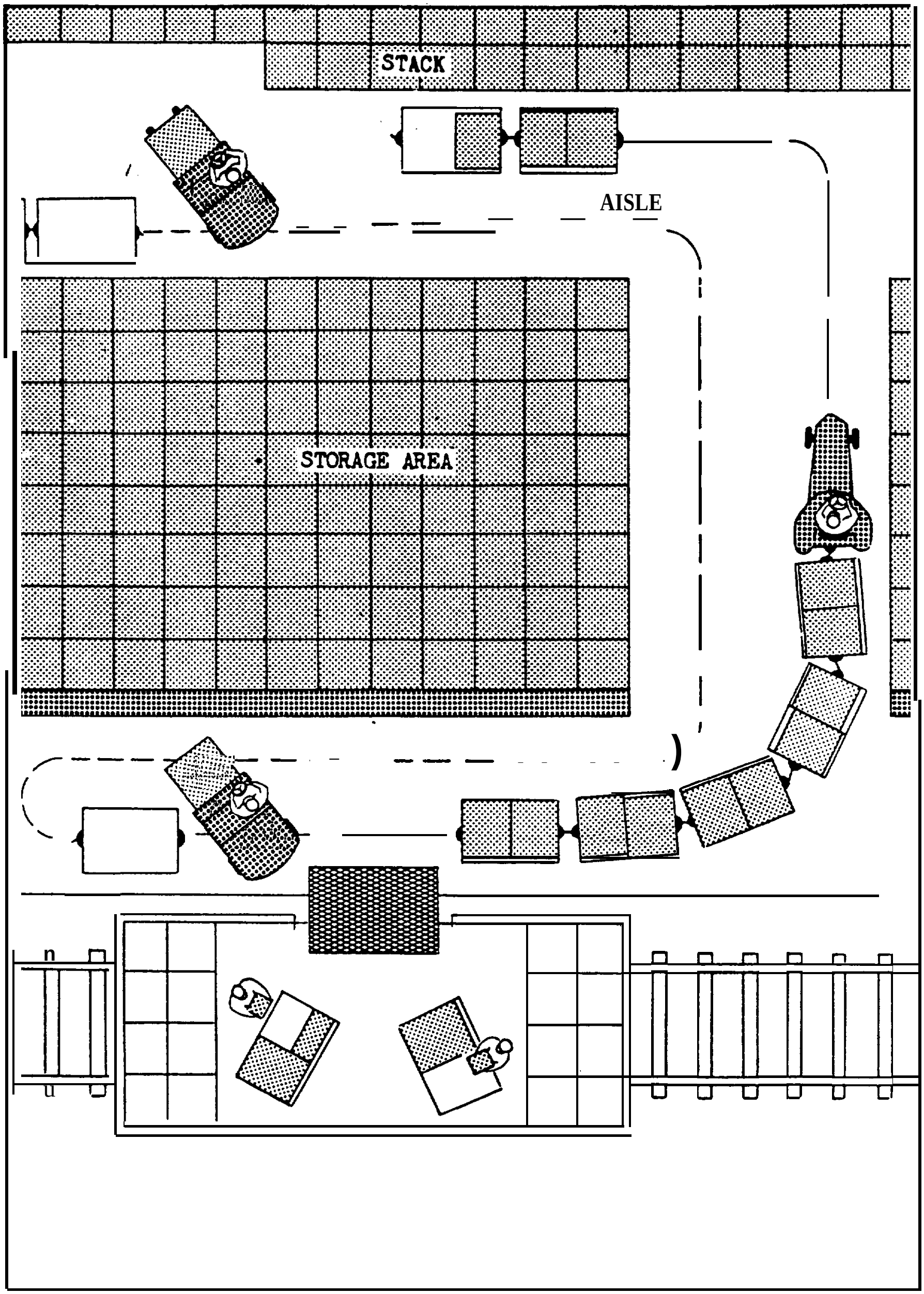
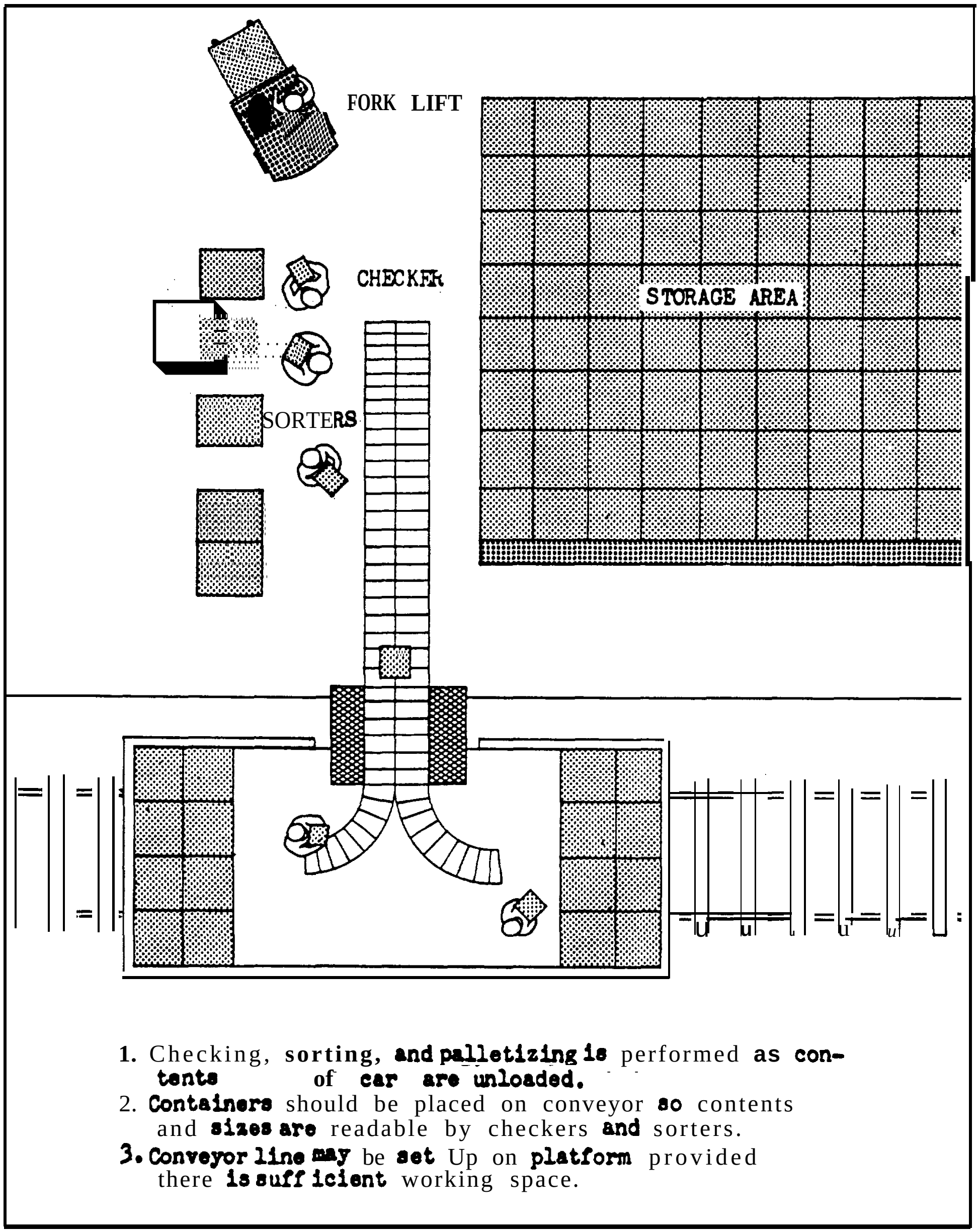


Figure 3–2. Unloading and movement to storage using tractor-trailer train.



1. Checking, sorting, and palletizing is performed as contents of car are unloaded.
2. Containers should be placed on conveyor so contents and sizes are readable by checkers and sorters.
3. Conveyor line may be set Up on platform provided there is sufficient working space.

Figure S-S. Unloading and movement to storage-?nixed car lots.

ceipt processing cycle will vary depending on the type of receipt and the location of activities involved in the receipt actions. Copies of the document or information extracted from the documents are used for inquiries to the locator file and for updating the various accounting records associated with material receipts.

3-107. Marketing of Material for Storage

a. Material properly marked prior to movement to storage will result in more accurate stock accounting, more accurate issues, and easier inventory actions.

b. All material or its container (excluding small items of retail stock) must be marked clearly with the stock number, nomenclature, quantity and unit of issue. Material which deteriorates in storage (subsistence, batteries, film, etc.) requires date marking to aid in first in-first out issue. Any markings on containers not applicable to the present material will be obliterated.

c. Small items of retail stock may be identified by marking the bin or shelf where item is stored. However, one item in each bin or shelf may be marked as a sample to assure positive identification of stock therein. The sample unit should not be issued except when quantity of items has been depleted to a point where issue is required.

3-108. Moving Supplies to Storage

a. Movement of supplies to storage is a continuation of the unloading and receipt processing actions. The material movement should be made by the most expeditious and economical means available. Matters for consideration include the selection of equipment to be used, the type of supplies to be moved, and the distance of the storage area from the carrier or receiving area. Where conveyor' or in-floor tow systems are not available, a forklift truck is generally used for short distance movements (less than 400 feet each way); a tractor-trailer train (possibly electronically guided) for larger distances (over 400 feet); or automotive equipment for certain conditions such as difficult terrain or excessive weight of material. The latter equipment may be radio controlled intra-installation transport vehicles. See chapter HI, section 3, of this regulation for location control of material movement.

b. Repacking operations should be integrated with overall movement actions to reduce handling. In other words, the material should be routed through the appropriate processing actions prior to final storage.

Section 2. SHIPPING

3-201. General

a. This section provides guidelines in shipping operations as they pertain to storage functions. Primarily the guidelines deal with selection and movement of material through the supply operations and subsequent delivery to the transportation officer for outloading. Specific shipping instructions are found in DOD 4500.32–R (Military Standard Transportation and Movement Procedures (MILSTAMP)). In addition to the provisions of this section, the procedures and controls, prescribed in section 8 of this chapter, will be applied to shipments of classified, pilferable and sensitive items, including small arms.

b. The term "shipping" in its broad application covers many functions and tasks. When "shipping" is related to wholesale storage operation it encompasses the actions necessary to deiiver material to the carrier for movement to a consignee. Its effectiveness depends upon accurate recording of receipts, proper storage, and correct marking of material.

c. The application of the principles of efficient shipping practices can alleviate unnecessary strain on transport facilities and provide more efficient and economical handling and movement of DOD cargo.

d. The shipping operation involves different or-

ganizational elements. This section does not imply that functions mentioned will be performed by a particular element within the installation.

e. The provisions of this section do not apply to shipments of ammunition and other dangerous articles. Directions for the preparation and shipment of such items are contained in directives issued by the military services.

3-202. Shipment Planning

a. Planning for shipping operations actually begins long before receipt of a document authorizing issue. "The receipt, location, and storage of supplies should be planned in a manner to expedite and simplify subsequent stock selection and preparation for shipment.

b. Planning for a specific supply movement begins upon receipt of information regarding items to be shipped to a particular destination. Proper consideration of the factors shown below will determine when and where to spot carrier equipment, when and where to use special equipment, and the most efficient way to assemble the material for shipment.

(1) Quantity, weight, and cube of material to be shipped.

(2) Requirements for security, packing, shipment marking, intra-installation material movement, personnel, and materials handling equipment.

(3) Mode(s) of transport to consignee.

(4) Date required for release to transportation.

3–203. Freight Planning

a. Freight planning is the process of determining the number of transportation units (truckload, less than truckload, or carload and less than carload, and container) needed to move a given shipment. This is accomplished by determiningg the weight and (if Possible) the cube of the line items shown on the shipping documents and ascertaining the mode of transportation. Transportation equipment of adequate capacities should then be obtained. Supplies and material should be assembled and shipped in intermodal containers, carload or truckload lots whenever practicable, in order to reduce the transit costs and conserve transportation equipment.

b. All shipments, regardless of weight, should be referred to the transportation officer at the originating installation. While route orders may be requested and obtained on all shipments, generally a 10,000-pound minimum (subject to specific exemption by the individual services) is observed. A route order will specify the mode of transportation and routing. If a domestic shipment is involved, the route order will be valid for a time frame as designated in the Military Traffic Management Regulation (AR 55-355, NAVSUPINST 4600.70; AFM 75-2, MCO P4600.14A, DSAR 4500.3); if an oversea shipment is involved, the order will specify a date for arrival at port.

c. It is the responsibility of the storage office to furnish the transportation office with all necessary information for obtaining routings.

3-204. Documentation

a. Efficient handling of supplies being readied for shipment requires the preparation of documentation in time to accompany shipment. The system for control of outbound shipments varies with the services and is therefore not covered in detail here.

b. An overriding factor, regardless of shipping service, is the fact that all shipments must be properly documented to eliminate delay, damage, or loss. Unless properly documented there can be delays in loading, turn-around time of equipment; time to reach destination; or material loss due to misdirected shipments.

3-205. Shipment Preparation

a. Whenever a shipment is to be made, the supplies should immediately be properly packed, documented, marked, inspected and assembled in a convenient area so that no time will be lost in carrier loading. Equipment should not be ordered from the carrier before it is known that supplies@ be ready for loading.

b. Generally, supplies are moved to an assembly area or shipped direct from the storage area. The latter method permits expeditious loading with elimination of the in-between step of consolidation at a preassigned area.

c. Supplies requiring preservation, packing, marking or other processing should be moved to and from these functional areas via mechanized transport facilities when possible. Mechanized transport includes use of powered conveyors, intra-installation transport facilities designed especially for this task, and electronically controlled tractor trailer trucks. The key is minimal or zero manual handling, cross hauling and double handling. Intra-installation transport conveyances should be radio controlled and operate on appropriate sched-

ules to prevent backlog and bottlenecks at material transfer points.

d. After the load has been prepared for shipment (or before if possible), the transportation office should be requested to order equipment from the carrier. The request should include precise information for spotting of equipment and any special requirements such as the need for double door freight cars, refrigerated trucks, etc.

e. When supplies must come from different warehouses or storage locations, the carrier equipment may be spotted accordingly, rather than being held at a single loading point. Effective spotting will ensure loading within, the prescribed free time limits and maintain a balanced operation by effective use of material handling equipment and personnel.

3-206. Loading

Section 9 of this chapter provides procedures and techniques for loading carriers.

Section 3. STOCK LOCATION

3-301. General

Stock location systems must pinpoint an exact storage location in a simple, easily understood manner. This is necessary to minimize training requirements, to assist in timely and accurate storage or selection of stock, and to provide abase for optimum utilization of storage space. This section prescribes the basic requirements of a location system.

3-302. Policy

a. Each military service/agency will establish a uniform stock location system to be used by subordinate supply and storage activities. These systems will provide a centralized stock locator file to the maximum extent practicable. Stock location systems will make optimum use of mechanized processing equipment, communications systems, and automatic data processing (ADP) equipment. Ammunition stock locations systems including planographs, storage site data records, and identifications, locator and inventory records and procedures will be established as prescribed by the responsible military services commands.

b. Planning for storage locations for classified, sensitive, and/or pilferable items will include coordination with the Security Officer/Provost Marshal to ensure that the security guidance provided in chapter III, section 8 is implemented.

3-303. Design of a Stock Location System

a. Planograph. A planograph is a drawing of the actual layout of a storage structure or outside storage area. The planograph portrays the manner in which the gross space within the storage structure or outside storage area is subdivided. These subdivisions can be for such functions or uses as storage areas, shipping and receiving areas, main aisles, working aisles, locker or restrooms, and offices. The chief of the storage activity is responsible for the preparation and use of planographs. Planograph layouts are subject to approval of the individual designated by the pertinent commodity and capacity factors established in chapter II, section 2. Planographs for ammunition igloos will be developed as prescribed by the responsible military service. The warehouse planograph will be located in a prominent or focal point of activity in each warehouse, shed or other storage area of comparable size. It should be mounted on a wood back and covered with a clear, acetate overlay. Space vacancy information may be incorporated on this overlay by use. of a grease pencil which will enable easy revision as required. Maintenance of planographs is at the discretion of each DOD component.

b. Perimeter lines. The lines drawn around the outer side of any space subdivision on a planograph are called perimeter lines. The term describes the outer boundary of any storage area.

(1) The area shown on general purpose warehouse planographs for bulk storage will be divided into equal 52-inch segments in width and length directions. These segments will be subsequently

referred to as "grids." This concept is based on use of the general purpose pallet, 40 inches long and 48 inches wide plus 4 inches for material overhang and handling space. These grids are used to denote locations and the position of pallets along working aisles. The depth of pallet storage can be shown on the planograph by broken lines (figs. 3-4 and 3-5). If the perimeter line along any side of the storage area is not equally divisible by 52 inches, the marginal difference should be prorated to increase each grid proprotionately.

(2) The details of drawing perimeter and intersecting lines on the planograph for large lot and medium lot bulk storage are the same (figs. 3-4 and 3-5). Large and medium lot terms are explained in chapter 1, section 2.

(3) Use of perimeter and intersecting lines in establishing grid patterns for small lot bulk storage is shown in section 2 of figure 3-6. The term "small lot" is explained in chapter 1, section 2.

(4) For storage areas with bin, shelving, and pallet rack storage aids, the dimensions of the storage aids will govern the planograph grid layout. In these areas the 52-inch grid pattern will be disregarded. Section 1 of figure 3-6 is an example bin or shelving layout. Figure 3-7 is an example pallet rack type storage layout.

(5) Perimeter and intersecting lines for shed, transitory shelter, standard magazine, and open storage areas are shown on the planograph in the same manner as prescribed for general purpose warehouses.

c. *Identification of grids.*

(1) Identification of individual grids will begin at the bottom left side of the planograph and continue in sequence to the top. This procedure will be repeated for each row of grids moving in sequence from the left to the right side of the planograph (figs. 3-4 and 3-5). Sequence of left to right identity may begin anew for each section, bay, etc., if desired. The sequence of planograph identity for these length and width grids will be consistent for all installation storage areas regardless of the number of area subdivisions. These grid identities then become part of the location description pattern *(d* below) used for locating material. Generally, a specific grid will be situated in the same relative position within similar storage structures or within open storage areas. This minimizes the need for personnel to reorient themselves when moving from one storage area to another. Once the grid identities have been determined, it is unnecessary to show on the planograph those grids not being used for material storage except aisles in bulk storage areas ((2) below). The planograph should show the grid identities required to locate stocks. Unused grids will remain available for floor plan changes as necessary.

(2) In order to provide flexibility for stock increases which require layout changes, grid identities will be provided for aisle space surface areas *on* bulk storage area planographs. Thus, grids required for locations in the new layout will be readily available in proper sequence without disturbing the marking of grids previously established (figs. 3-4 and 3-5).

d. Location description pattern. Each material location in storage must have a description pattern which will permit immediate recognition of the specific site. This description consists of numeric or alpha numeric characters and is preferably separated into groups for easier reading. The significance of individual characters or group of characters in the location description will be established by each military service or agency. The location description pattern established should assure that the number of characters used are kept to a minimum and yet clearly identify material locations.

(1) Installations with building, warehouse, area, or block designations which have permanently assigned engineer drawing numbers or letters may assign other code designators to such facilities for location description pattern purposes only. However, reports related to utilization, building schedules, etc., will refer only to the permanently assigned number or letters.

%304. Location Site Identification

a. *Marking.* When planographs have been drawn and the location description pattern has been established, location identifications at the actual sites are necessary.

(1) In open storage areas, appropriate location identification at strategic points will be shown on permanent, weatherproof placards or signs.

(2) In warehouses where floor surfaces permit, location description markings should be displayed on the floor. Marking can be applied with decals, by stencil brush, or by spray paint equipment. When applied to a clean floor and protected by a coat of clear lacquer or other suitable compound, sprayed or stenciled markings should last for sev-

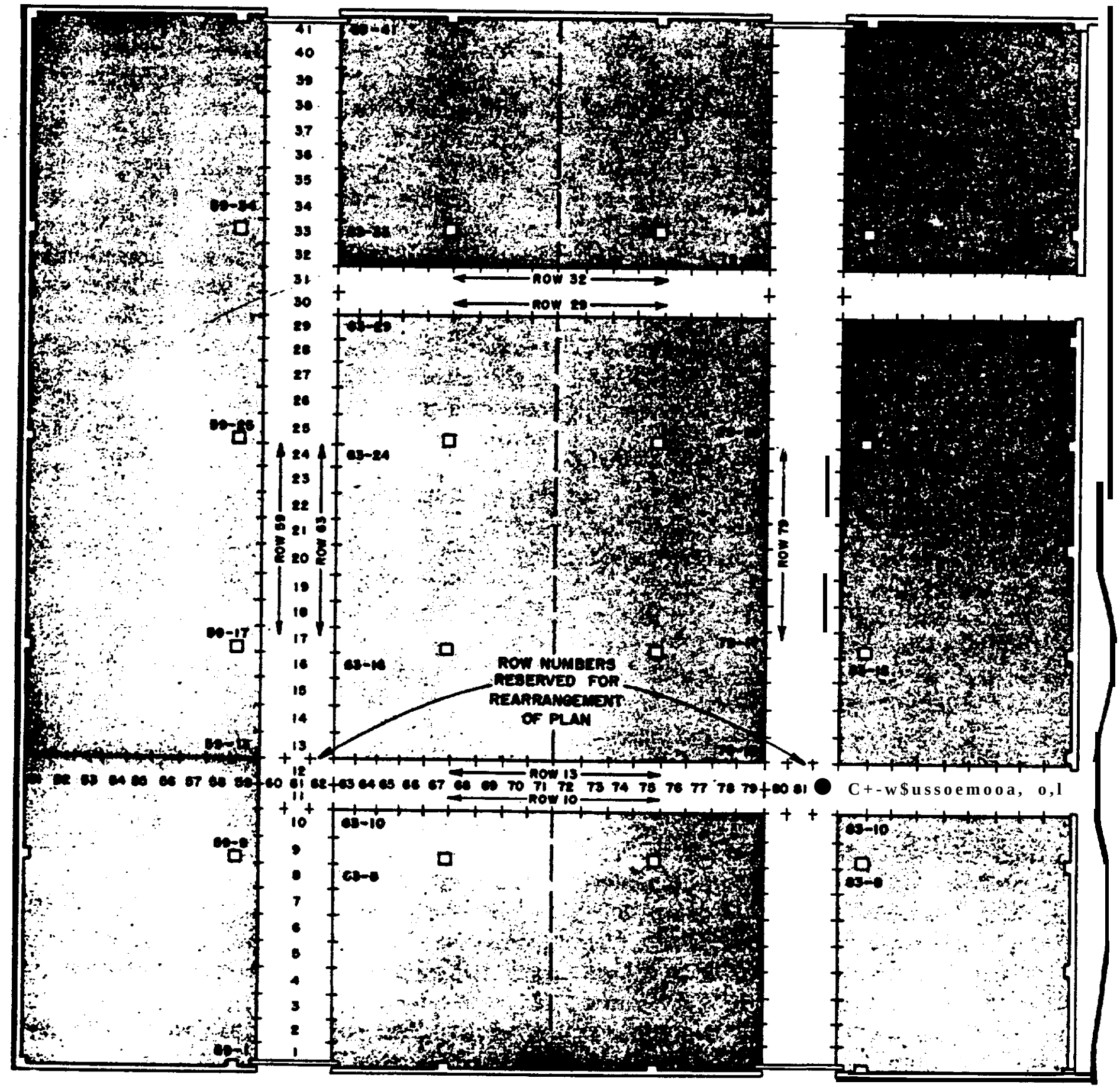


Figure S-4.. Example of stock location layout for large lot bulk storage.

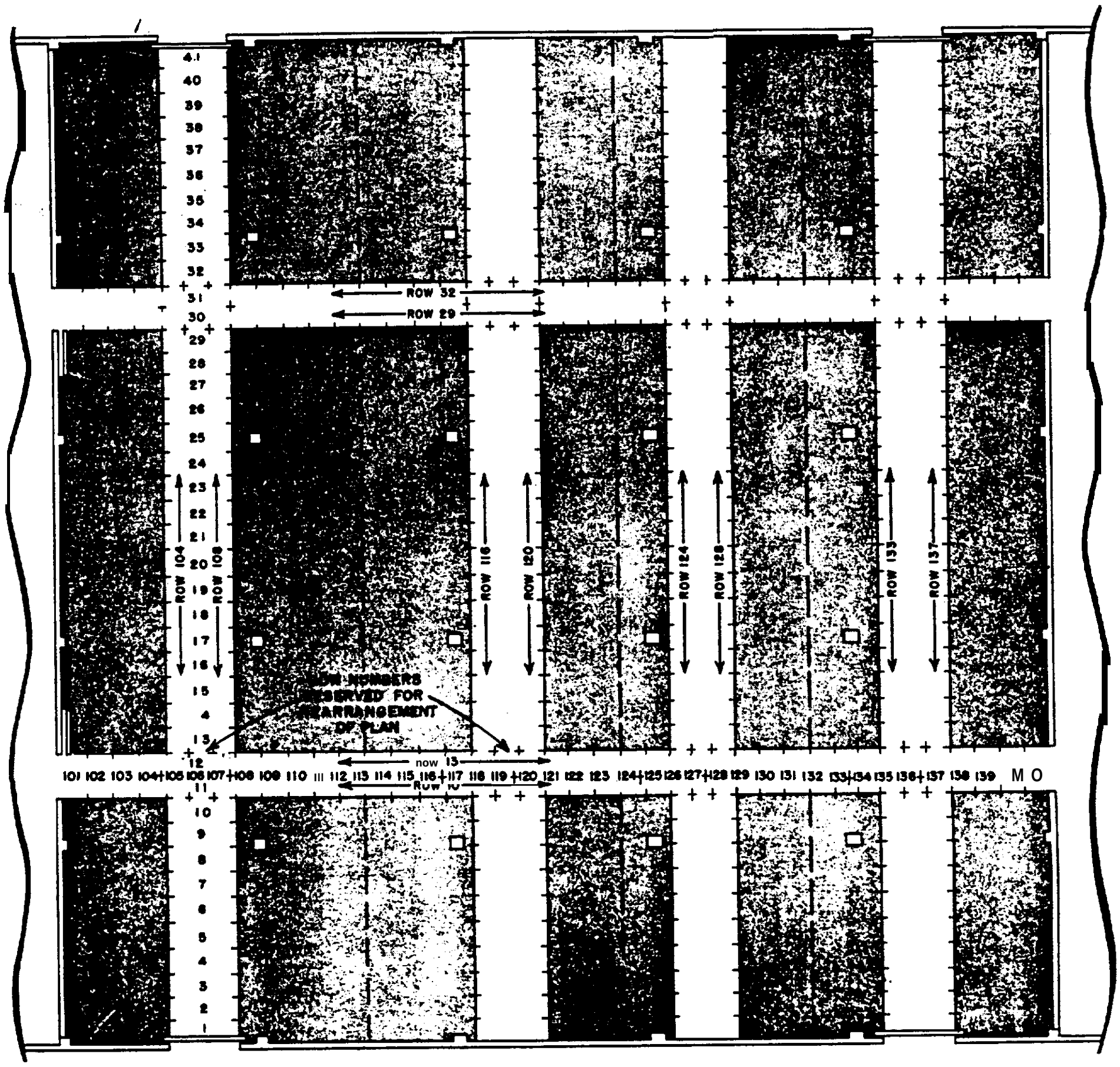


Figure 9-5. Example of stock location layout for medium lot bulk storage.

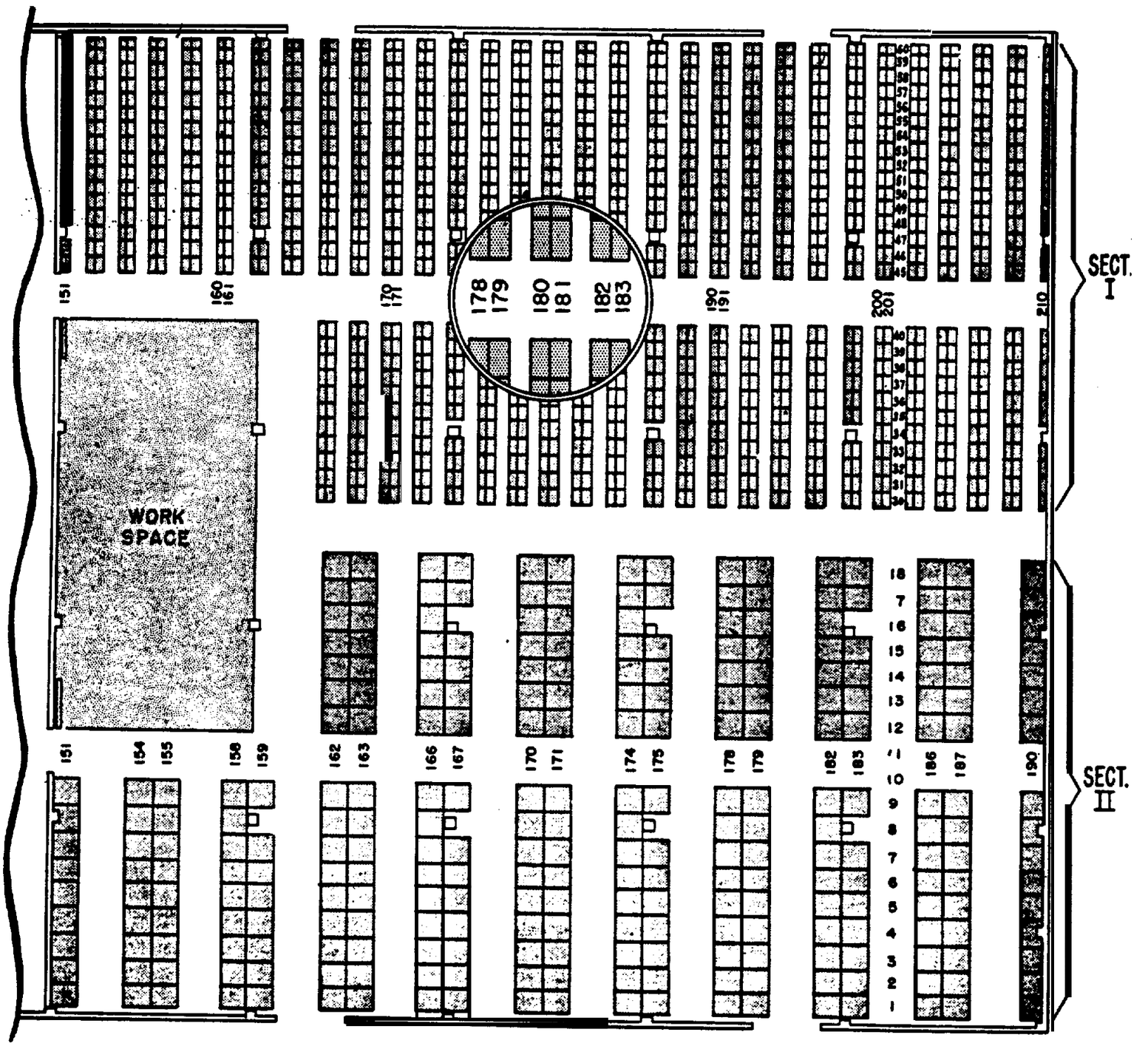


Figure 3-6. Example stock location layout for retail bin or shelving and small lot bulk storage.

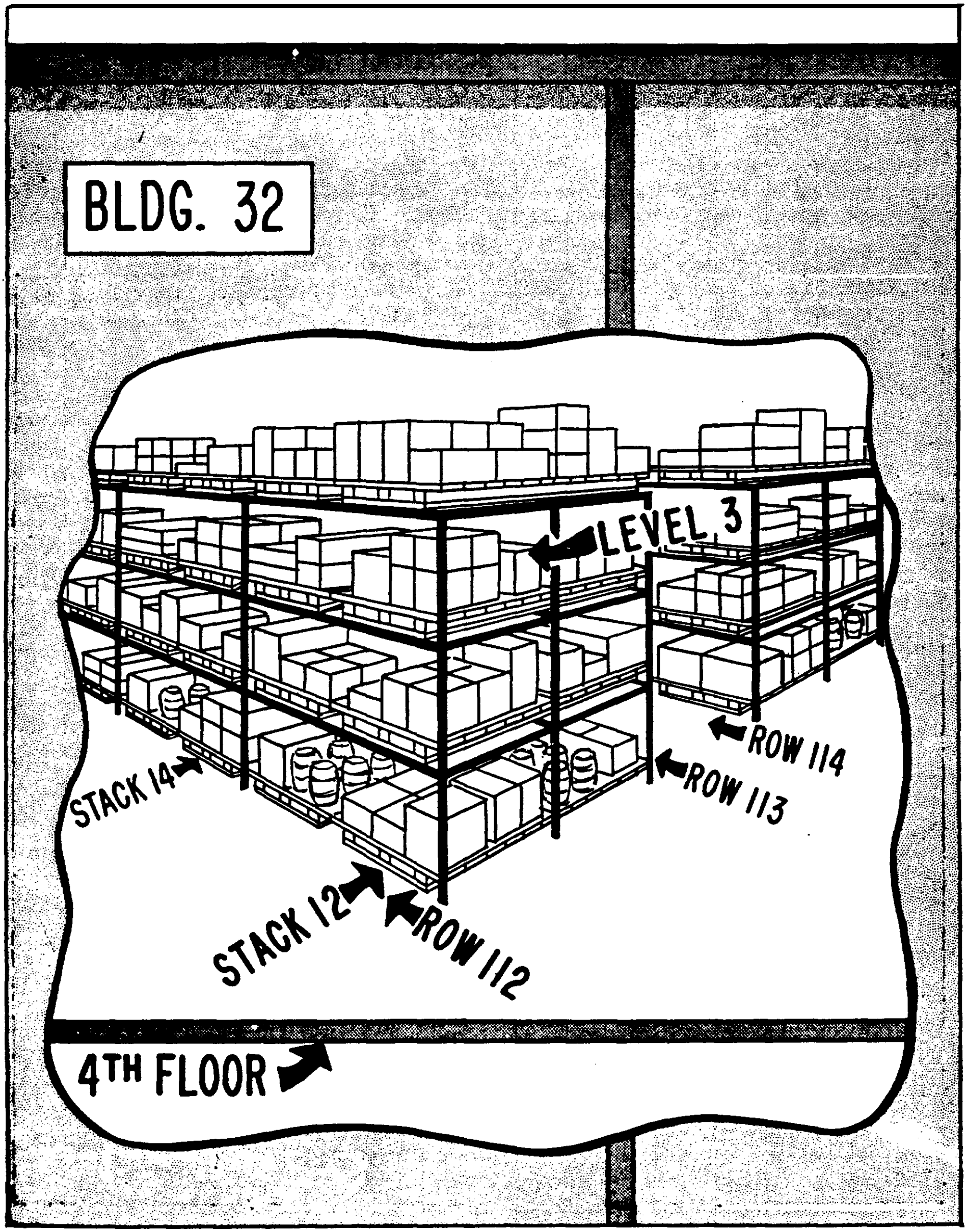


Figure s-7. Example of view of a pallet rack type stock location layout.

eral years in normal warehouse operations. Markings should be placed within the aisle boundaries in order to be visible at all times and at the edges of the aisle to reduce wear from personnel and vehicle traffic. Where the floor-marking method is not practical due to type of floor surface, markings may be displayed on posts facing operating aisles, or on other suitable easily visible structural members, or as otherwise directed by the responsible military service/agency.

(3) For sheds and transitory shelters, location markings will be displayed in the same manner as warehouse markings.

(4) The quantity of location markings in storage areas will be as directed by the responsible military service/agency. As a minimum, each aisle intersection should be marked and every fifth grid should be marked along working aisles.

(5) Due to variables in aisle and sotrage aid dimensions in bin, shelf, and pallet rack storage areas, the standard method of marking prescribed for bulk storage areas cannot always be applied. However, suitable location identification will be displayed. Applicable markings will be posted on storage aid ends facing working or traffic aisles. Additional markings may be painted on the floor (fig. 3–8).

(6) In addition to the site marking described in preceding prargraphs, marking is also required for vertical location identification in certain cases. For example, this type marking is required on bin, shelf and pallet rack openings to designate a particular vertical location. Numeric or alpha characters may be used (figs. 3-7 and 3-8). In the case of bulk storage areas where vertical identification is not required, a standard alpha or numeric character should be used within the location description pattern to maintain uniformity.

3-305. Maintaining the Location System

Maintaining the stock location system is a responsibility of the storage management activity. Warehousing personnel will not normally keep records of receipts and issues or maintain balance records, however military services may authorize an exception for ammunition.

a. Stock locator file. A stock locator file is the "heart" of a stock location system. It is an address directory for all stored material.

(1) Existing records may be used to initially develop the locator file. To assure optimum accuracy, however, file establishment should include a complete wall-to-wall survey of material on hand. Appropriate location information is then entered into the locator file. The file must contain a locator record for each item stored. A record should reflect, as a minimum, the stock number, condition code, unit of issue, and location(s). Additional data may be entered as deemed essential to operations, for example, noun nomenclature, physical security/pilferage codes, shelf life codes, expiration dates, or lot numbers.

(2) Procedures must be established to insure positive control of all additions, deletions, and changes to the locator file. Effort must also be directed to limiting the number of stock locator records. This can be done, in part, by selecting storage locations which can hold the total quantity on hand. Intelligent selection of locations for stock issues and receipts plus consolidation of multilocation material into fewer or into a single location will also aid in reduction of locations per item.

(3) Site of the locator file will depend on the installation layout and the type of stock locator system used, i.e., maintained by manual means, or by use of EAM equipment, or by use of ADP equipment. The file could be located in an appropriate storage operation, in a central machine processing office, or as part of central computer records. There will, however, be only one locator file maintained except when a supplementary file is necessary for control of security items.

(4) Activities without an EAM or ADP capability or activities which store only a small number of items may use a locator file system which is maintained entirely on a manual basis. Location data maintained on ADP equipment can be available almost instantaneously by use of certain ADP remote inquiry equipment. The EAM and ADP methods can mechanically or automatically provide, in varying degrees, related supply documentation such as labels, stock selection forms, material movement forms, and inventory count cards. Use of EAM and ADP equipment will minimize actions and provide speed and accuracy in processing location actions and in the maintenance of the locator file.

b. Receipt *of material.* Upon receipt of material, the locator file will be screened for the stock number received. When a location already exists, the material will normally be routed to that location upon completion of identification and classification actions. If the quantity received obviously would not

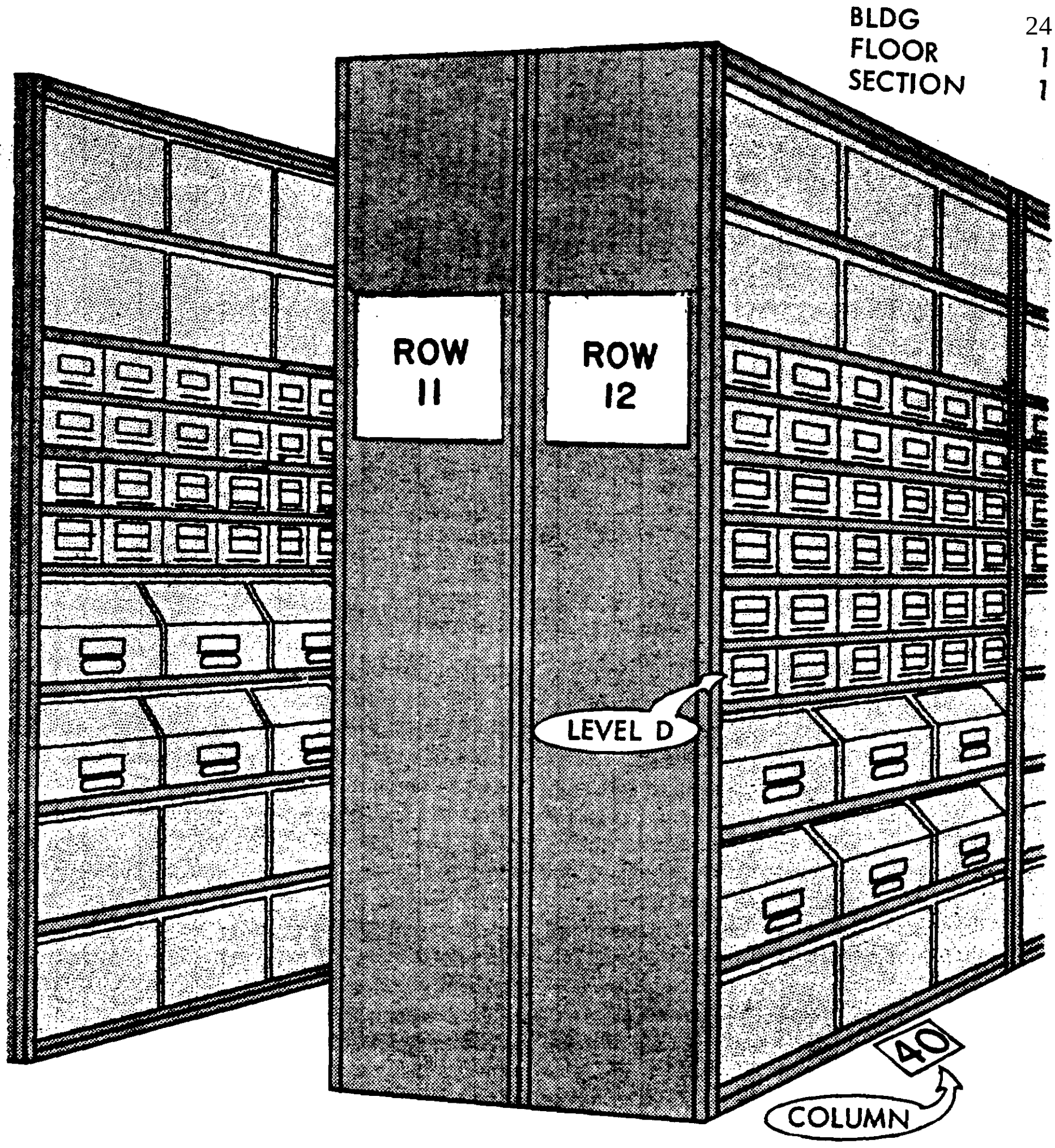


Figure 3–8. Example bin location descriptive pattern, including use of vertical location identifier.

MATERIAL TRANSFER RECORD	DATE MATERIAL RECEIVED
CONSIGNOR	
INVOICE OR IR NUMBER	TO (Building)
LOCATION DATA	QUANTITY
1. Enter stock number and nomenclature of item. 2. Enter existing location (s) if one or more exist. 3. Warehouseman will annotate final location data and return to locator activity.	

DD, FORM AUG 55 858 REPLACES NAV. S. AND A. FORM 663, OCT 54, WHICH WILL BE USED UNTIL EXHAUSTED. GPO : 1958 OF—4 57723

Figure .?-9. Material transfer record.

fit into the existing location, the material will be routed to an appropriate warehouse area for final location selection by the warehouseman.

(1) For receipts without an existing location, if a file of empty locations by size and type is maintained this file will be used to prelocate applicable items. If such a file is not maintained, the material will be routed to the appropriate warehouse for selection of a final location by the warehouseman.

(2) Placing material into an existing location, establishing a new location, or deleting a location requires feedback to the locator file control activity. For this purpose, receipts moving to the storage location will be accompanied by either a Material Transfer Record (DD Form 858, fig. 3–9), or other approved service/agency form, or a copy of the receiving document. The document accompanying the material to storage must be annotated by the warehouseman with the final location data and returned to or through the locator file control activity for proper recording.

c. Issue of material. EAM machine or ADP computer generated issue documents may have material locations printed on stock selection documents. Activities without this capability must" screen the locator file and manually annotate locations.

For general supply items, when the quantity selected reduces the location balance to zero, the warehouseman will prepare a location delete action on the appropriate service/agency form and forward it to the locator file control acitivity. Because of item configuration or replenishment frequency, certain locations may be designated as permanent and not require deletion when temporarily empty. Criteria and procedures for control of this will be established by each service /agency.

d. Location changes. Warehousing actions frequently involve movement of stored material into anew location or consolidation with similar material in existing location(s). The location additions or deletions caused by these actions will be immediately annotated by the warehouseman on the ap-

propriate service/agency form and forwarded to the locator tile control activity.

e. Changes *to data elements* in *locator file.* Changes to standard elements of management data in the locator record, such as stock number, physical security/pilferage code, shelf life code, etc., may be accomplished automatically based on centralized service/agency data broadcasts when ADP capability exists. Activities without this ADP capability will require manual actions to alter locator file records. Service/agencies will establish procedures and documents to assure that the required data changes are addressed at the material location.

3-306. Special Requirements

Stock location systems require aperiodic validation of locator record data to ensure accuracy. This validation is accomplished in two phases. The first phase, a location survey, is done by comparing certain data in actual warehouse location with that in locator records. The second phase, a location audit reconciliation, involves a reconciliation between the validated storage activity locator records and the accountable activity stock record. The DODI 4140.35, Physical Inventory Control for DOD Supply System Material, is the basic document which requires these validations and establishes accuracy levels for the surveys and audits.

Section 4. PEST MANAGEMENT

3-401. Purpose and Scope

This section establishes the guidelines necessary to successfully maintain an effective stored products pest management program. Pest control is an element in the overall care of supplies in storage, which, in turn, is an integral part of the storage function.

3402. General

Many types of supplies are susceptible to infestation and damage by insects, rodents, birds, and other pests. Methods and equipment are not normally available to the consuming organization to permit reclaiming of infested stock or to provide adequate control measures. Therefore, both supply economy and troop health and welfare require that supplies be uncontaminated and undamaged by pests upon receipt by the consignee. The success and continuity of a pest management program is enhanced by the maintenance of accurate records and reports. Results of work accomplished should be reviewed periodically to measure the effectiveness of preventive control actions,

3-403. Objective

The prime objective of pest management activities is to prevent or minimize loss of supplies caused by such pests. This objective can best be achieved through the segregation and arrangement of infestible subsistence, proper warehouse sanitation, regularly scheduled inspections by trained personnel, and utilization of appropriate equipment, insecti-

tides, rodenticides and other control measures. Pest management is a continuous activity which begins with the production of stock, through the initial receipt of the stock and continues through to the ultimate consumer. In order for a stored product pest management program to be effective, the program must utilize various techniques, including both chemical and nonchemical controls, and actively involve storage, transportation, inspection, pest control, and concerned command elements.

3–404. Policy

DD Form 1532 (Pest Control Summary Report) (DODI 4150.7). will be prepared by installations to provide necessary data to ensure effective programs for selection and safe application of pesticides.

3–405. Responsibilities

a. *Assistance from other agencies.* Specialists of the United States Department of Health, Education, and Welfare (Public Health Service), the United States Department of Agriculture, the United States Department of Interior, and the United States Department of Treasury (Bureau of Customs) provide consultation service and assistance on problems of medical and agricultural importance (e.g., disease and pest control, quarantine control, customs inspection) as requested. Required technical assistance can be obtained from the area or command entomologist or applied biologists. Requests for services of these specialists will be made by the installation commander to the appropriate operating agency commander.

b. Quarantine control. Full cooperation will be given by all echelons of command to officials of other Governmental agencies to ensure compliance by supply activities with the quarantine regulations, requirements, and controls of such agencies as they pertain to supply operations. The responsible entomologist will provide technical guidance on the elimination of pests from military cargo and other aspects of quarantine control.

c. *Materials and equipment.* Only standard issue pesticides and equipment will normally be used in pest control operations. Pesticides and/or equip ment proposed to be substituted for those listed in the Federal Supply Catalog will be approved in accordance with instructions of the Military Department concerned. Equipment for the application of pesticides includes:

(1) Appropriate safety equipment.

(2) Aerosol generators.

(3) Fumigation equipment and facilities.

(4) Ultra-low volume dispensers.

(5) Power spray equipment.

(6) Fumigation chambers (in special cases).

d. Stored supplies.

(1) The installation engineer or public works officer will operate and maintain approved equipment for elimination of pests infesting stored sup plies in general purpose warehouse storage, controlled humidity storage, shed storage, and open storage. Fumigation, whether it be preventive or corrective in nature, is one of the basic tools of an effective pest management program. It includes the following

(a) The installation engineer or public works official will be responsible to assure safety precautions are in effect prior and subsequent to fumigation or other chemical pest control.

(*b*) As a minimum, individuals in charge will have the responsibility to notify station safety, security and fire supervisors and the resident medical authority of the fumigation operations, building number, proposed length of fumigation time, and name of fumigant being used.

(2) Approval of the installation commander will be obtained for fumigation of entire buildings to control pests and insect infestation in stored supplies.

(3) The storage officer will provide for movement of items to and from fumigation chambers and will prepare the items for fumigation. Items infested by insects or damaged by other pests may require shipment to commercial contractors for fumigation and cleaning. Repacking contracts may be utilized if adequate facilities are not available at the installation or if the work can be done more economically by this means. Such contracts will be reviewed by the appropriate area (including Naval applied biologist) command entomologist.

(4) Only trained and certified pest control personnel will apply residual or space treatment pesticides, fumigation, operate fumigation chambers and aerate treated items.

%406. Pest **Control Operations**

Pest control operations will provide the necessary measures to insure the safe and efficient control and quarantine of insects, rodents, and other pests. Pest control operations will be conducted as a sched-

uled part of the installation's regular repairs and maintenance program and will include—

a. Inspections by trained and certified pest control operators to determine the need for and effectiveness of pest control measures.

b. Establishment of construction needs and maintenance criteria for prevention of pests.

c. Land drainage, clearing and control of vegetation in outside storage and pest breeding areas.

d. Application of pesticides on materials, in buildings, on grounds, and as soil treatment.

e. Use of wood preservatives.

f. Fumigation and disinfecting of stored supplies.

g. Control of pests, grasses, or other weeds in storage areas.

h. Safe storage of pesticides and maintenance of pest control equipment.

3–407. Inspection

a. Spot inspection. Virtually all items of subsistence, except canned or bottled foods, are susceptible to infestation or damage by insects, rodents, and other pests. Woolens, mixed woolens, furs, feathers, felt, natural fibers, and untreated hard woods are subject to attack by insects. A spot inspection of any commodity to determine degree of infestation should rarely exceed 10 percent of the lot. Normally a 5 percent inspection will indicate the condition of the lot being inspected. In either event, inspection should be discontinued when infestation is first detected and the lot will be fumigated or otherwise appropriately treated. Subsequently, a further examination will be accomplished to determine whether or not the stock is suitable for issue.

(1) The importance of detecting insect infestation in the early stages cannot be overemphasized, particular y when climatic and other environmental conditions are conducive to incubation and migration. Certain insects are attracted to light and infestations may be detected by scanning windows and other sources of light. Insect activity can be anticipated when the product temperature is 50° F and above, or the air temperature is 60° F and above, and the relative humidity is in excess of 35 percent. Generally, insect activity will increase as the temperature and relative humidity rise. Therefore, the frequency of inspections will be increased during prolonged hot, humid weather.

(2) Some of the most common types of destructive insects are shown in figures 3-10 through 3–13. Figure 3-14 illustrates bread made with flour previously infested for various periods. Rodents and birds present a continuous, year-round problem.

(3) In the fall of the year, rodents in the fields are attracted to warm warehouses, especially warehouses where subsistence items are stored. Birds contaminate stored supplies when they enter warehouses to feed on spilled foods or to obtain shelter. Termites, which penetrate warehouses through expansion joints in the floor, destroy wood, paper and other supplies containing cellulose. Losses due to these pests can be held to a minimum by timely inspections and" prompt remedial action.

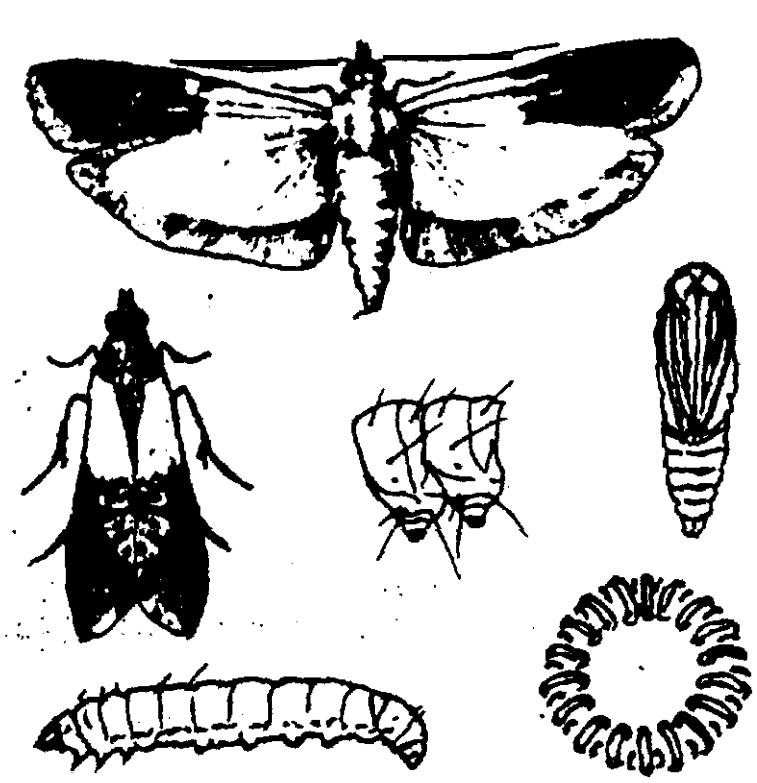
b. Inspection at time of receipt. A visual inspection must be made of ingestible supplies at time of receipt prior to unloading operations unless exempted by the headquarters having stock accountability for the" supplies.

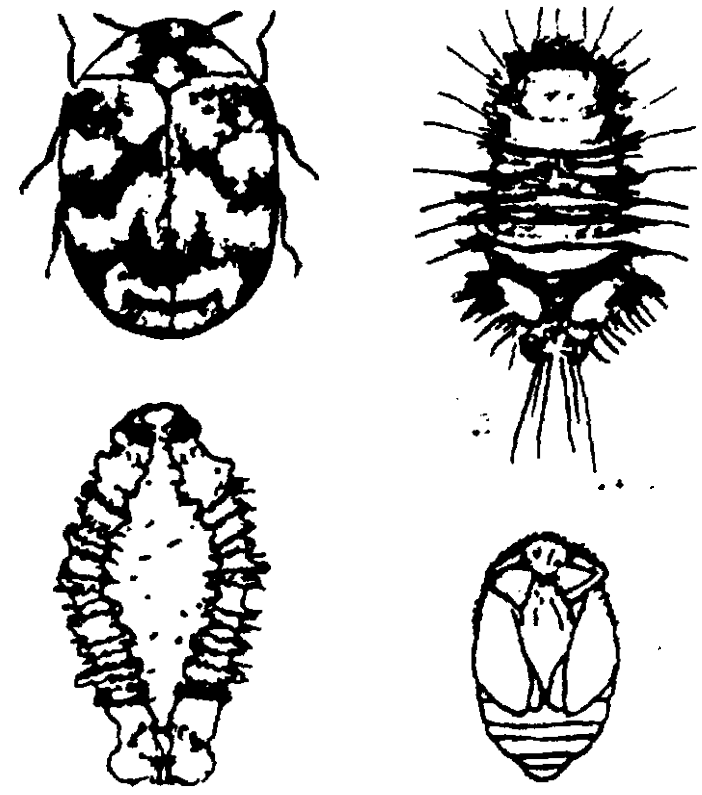
(1) If the supplies from the vendor are infested, the shipment should be rejected. However, if the inspection shows only a light car or container surface infestation, the stock will be placed in an isolation area which has been treated with an insecticide and will be fumigated before being placed in the storage area. The stock may be fumigated in the car or van prior to unloading.

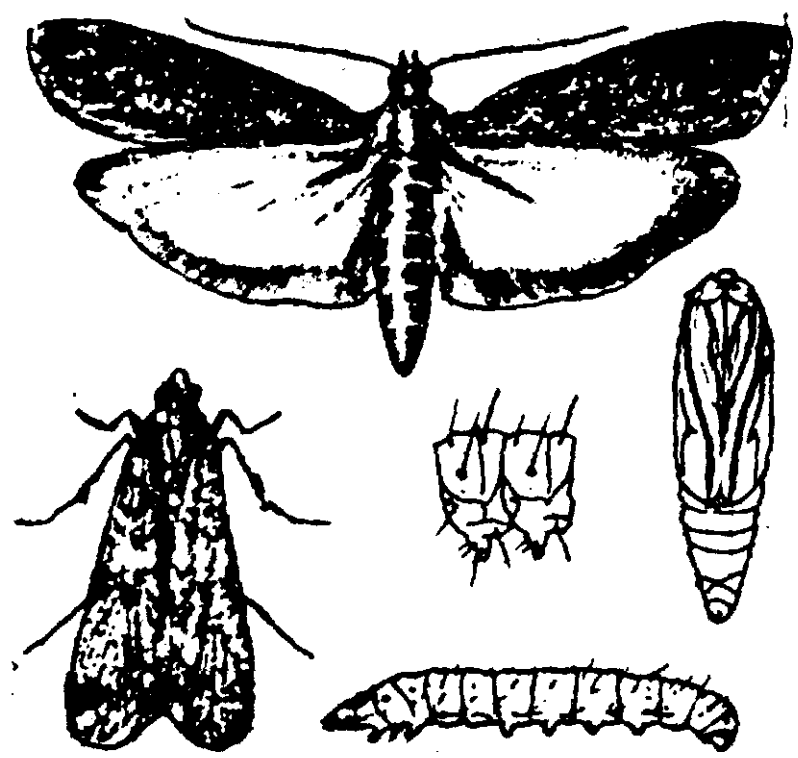
(2) When infestation is noted upon receipt, the headquarters having stock accountability should be contacted for specific instructions prior to acceptance or fumigation.

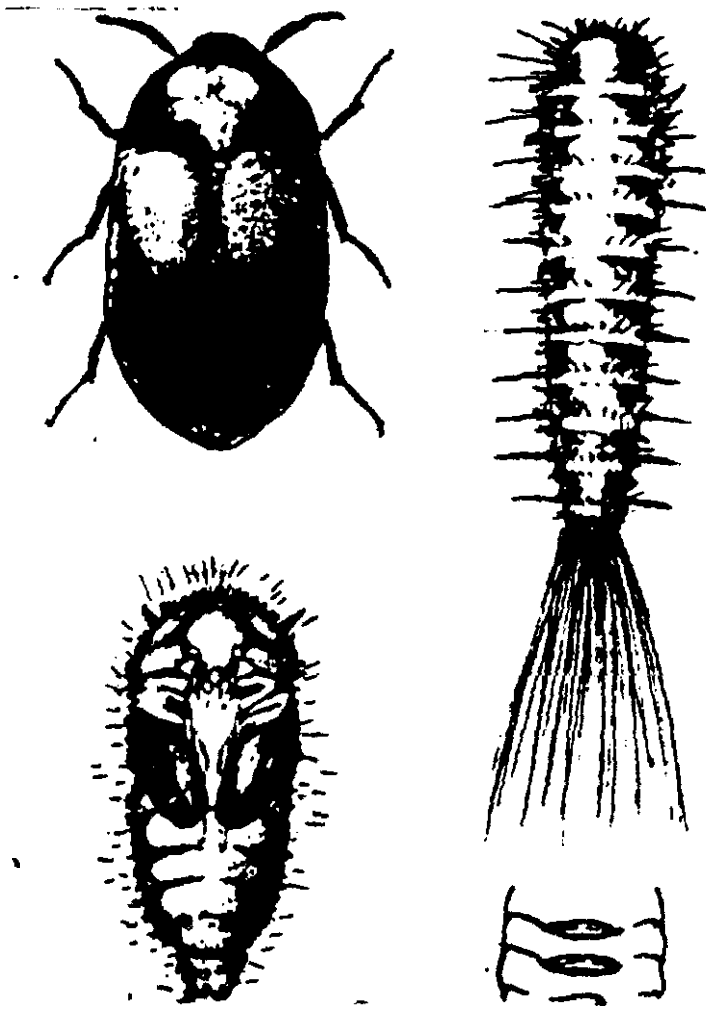
(3) Samples of infested supply items will be collected at time of inspection for technical evaluation and analysis by entomologists or taxonomically qualified entomology technicians. Such analyses are required for identification of insects, degree of contamination, and other purposes related to disposition of the lot concerned. Samples will also be taken of supply items suspected of being infested and these samples incubated for final determination of insect infestation.

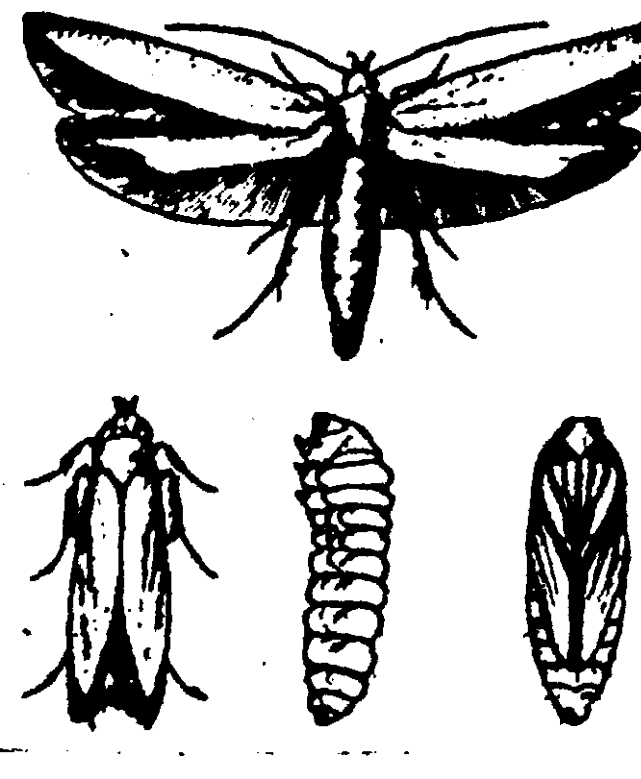
c. *Inspection of returned material.* Material returning to storage sites from using activities (especially inter-country movement) presents the possibility for introduction of pests and diseases of medical and agricultural importance. Disease vectors and agricultural pests may be introduced into the country receiving material in or on cargo, cargo containers, foodstuffs, or soil adhering to bags, boxes, vehicles, or other military equipment. A carrier manifest certifying that retrograde *cargo is*


INDIAN MEAL MOTH


VARIED CARPET BEETLE


MEDITERRANEAN FLOUR MOTH


BLACK CARPET BEETLE


ANGUMOIS GRAIN MOTH

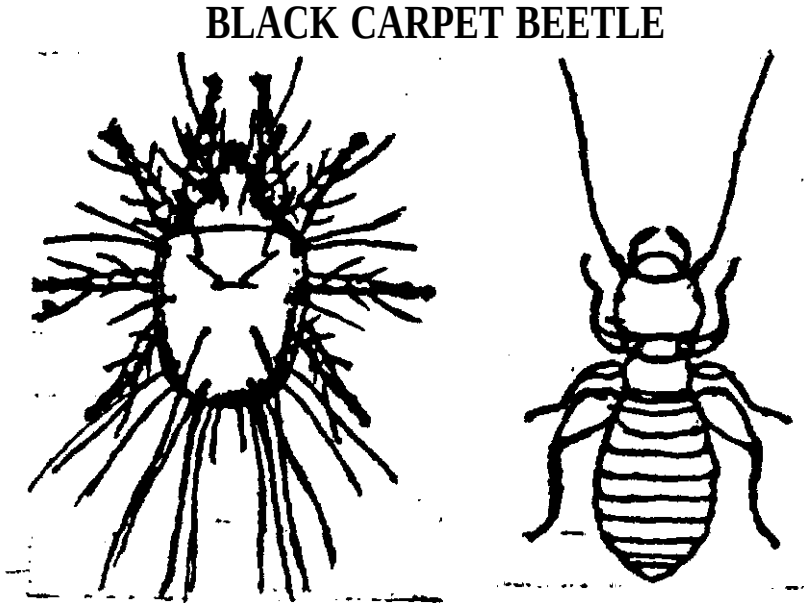
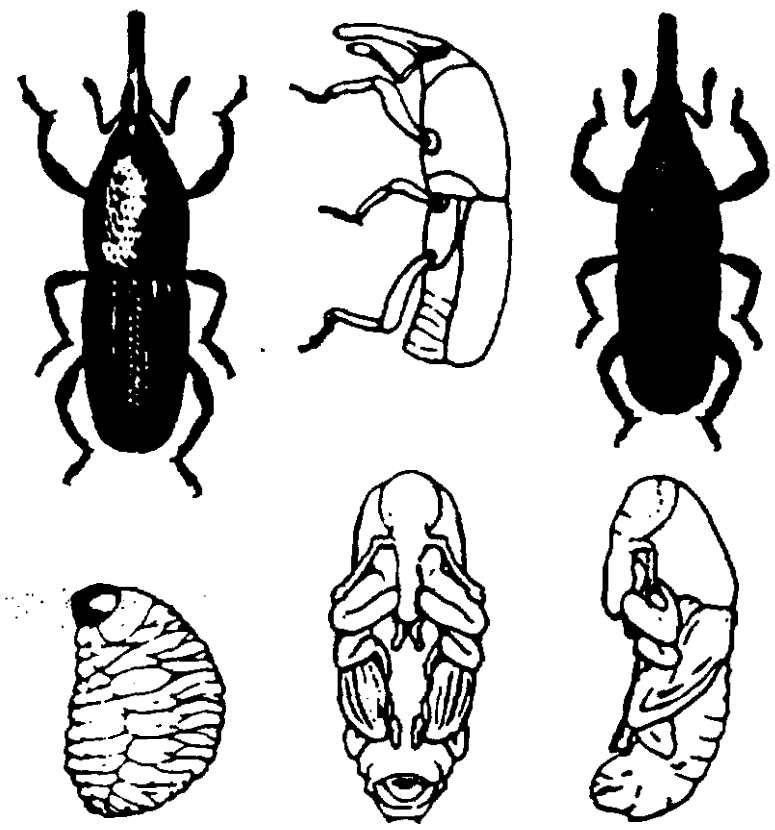
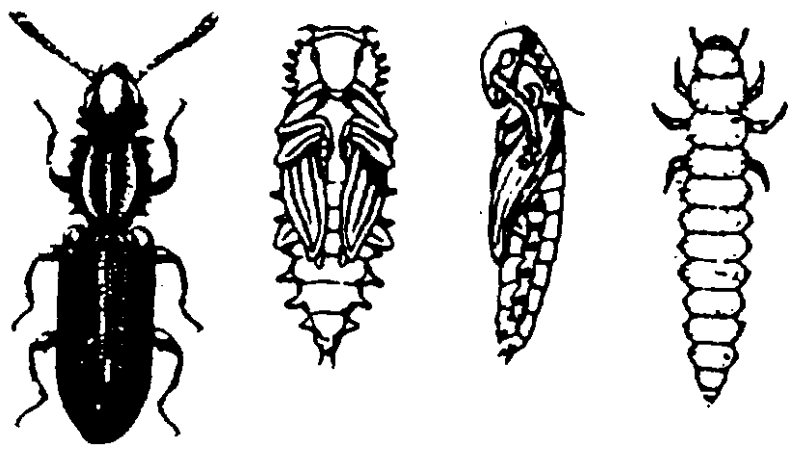

MITE
BOOK LOUSE

Figure 3–10.

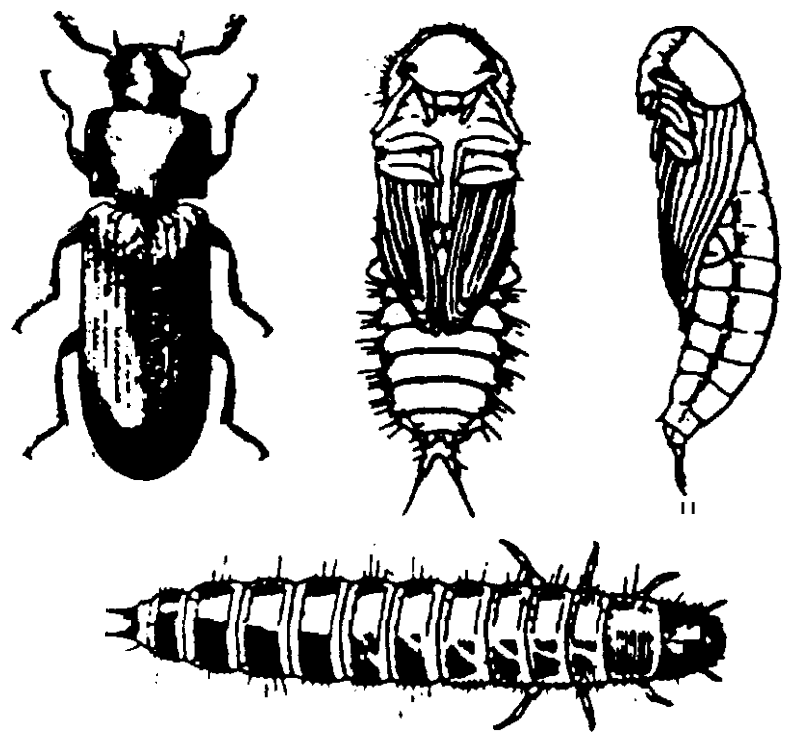


GRANARY WEEVIL

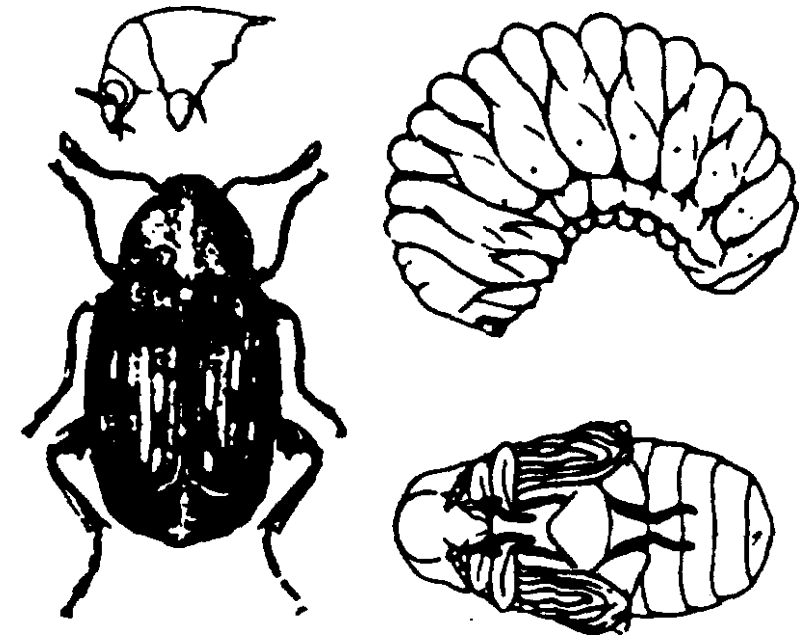
RICE WEEVIL



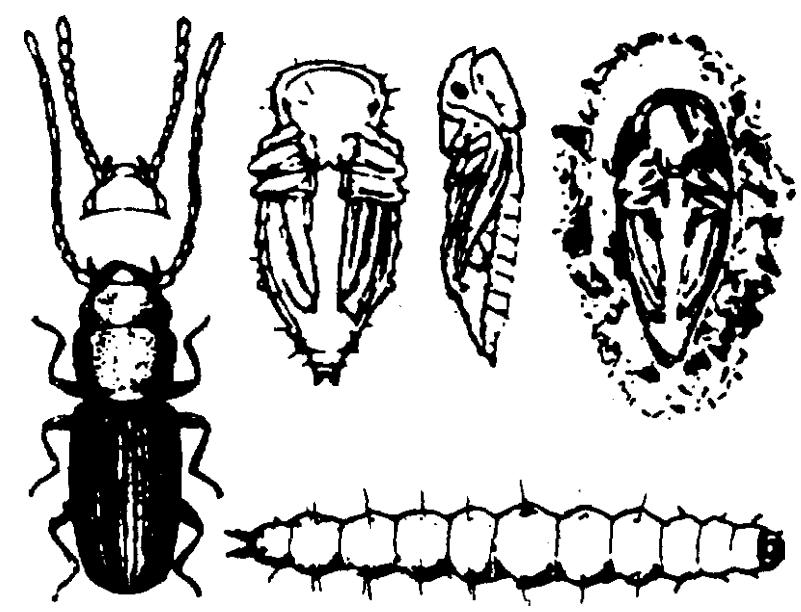
SAWTOOTH GRAIN BEETLE



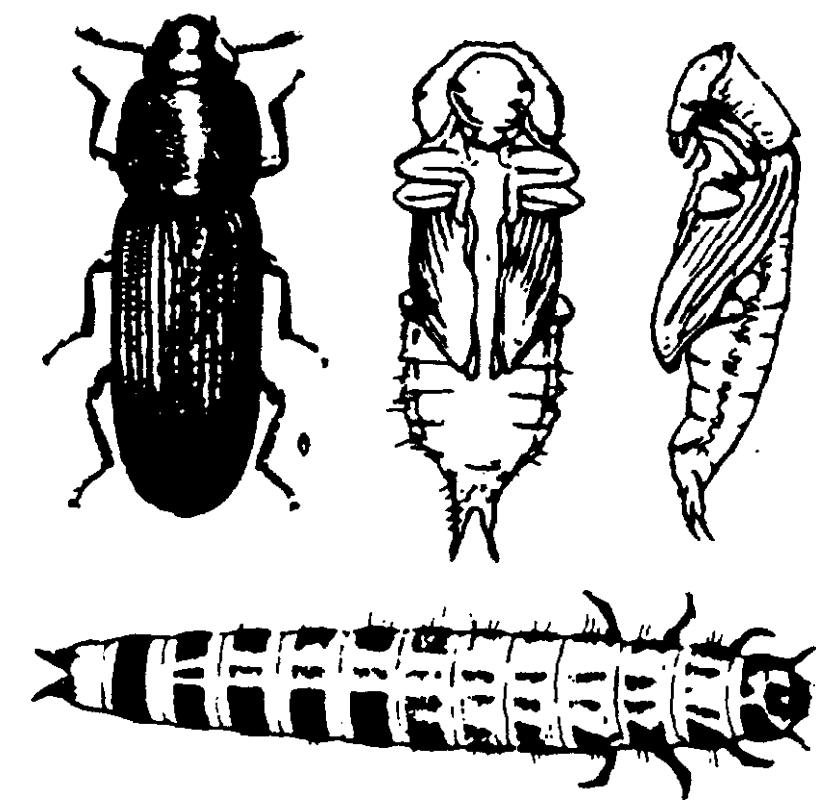
CONFUSED FLOUR BEETLE



BEAN WEEVIL

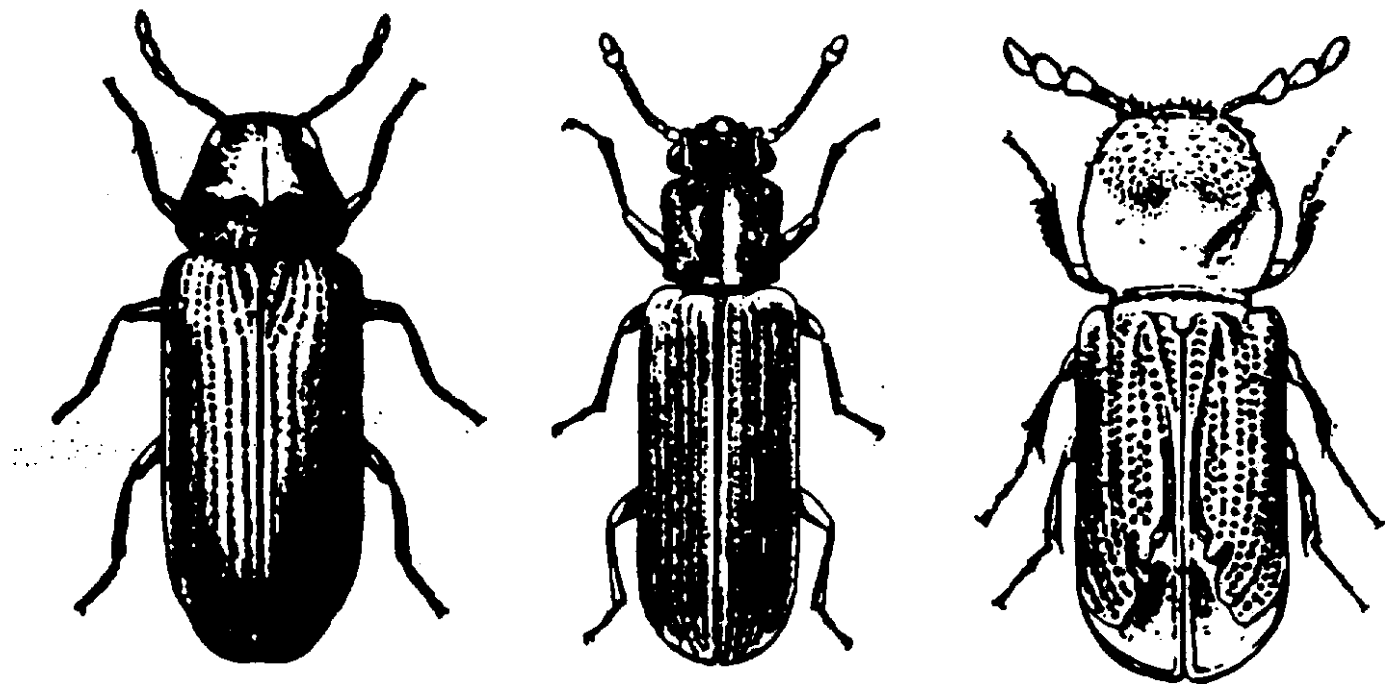


FLAT GRAIN BEETLE



BLACK FLOUR BEETLE

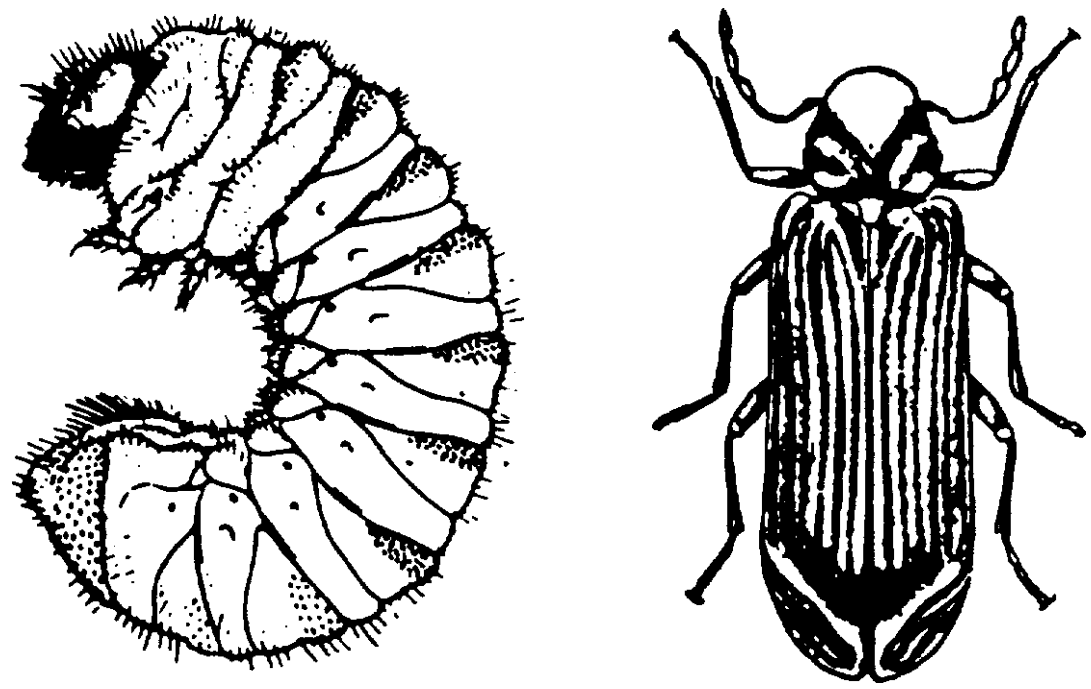
Figure 3–11.



FURNITURE BEETLE

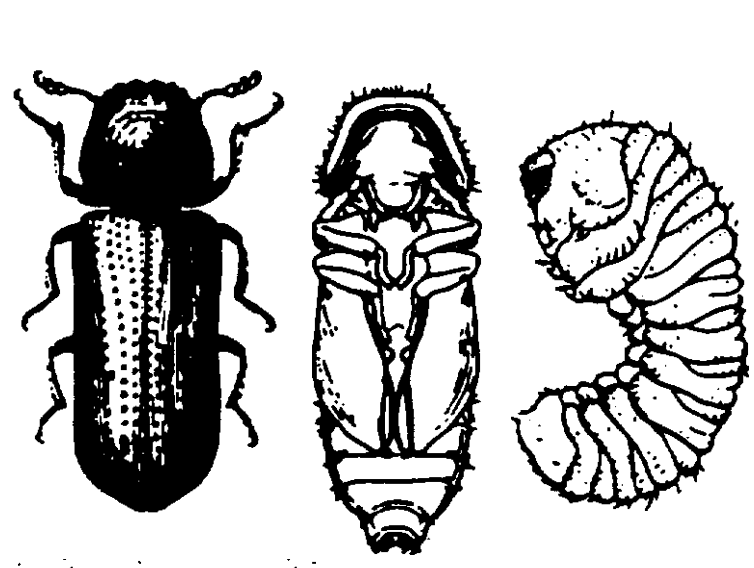
LEAD CABLE BORER

WESTERN POWDERPOST BEETLE

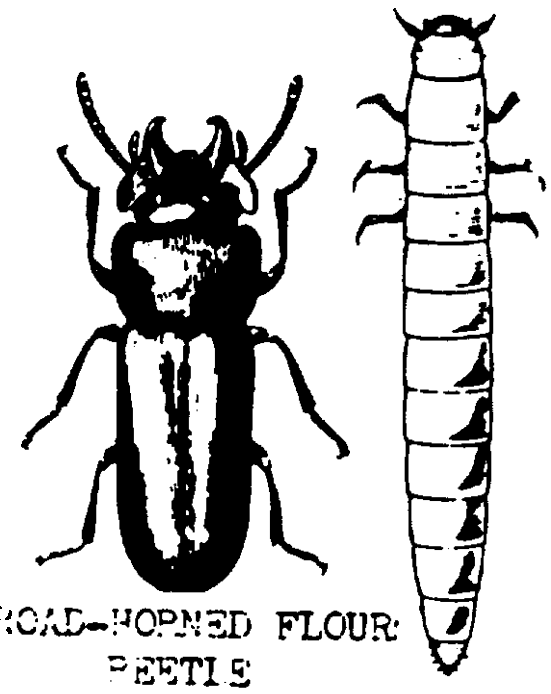


CALIFORNIA DEATH-WATCH BEETLE

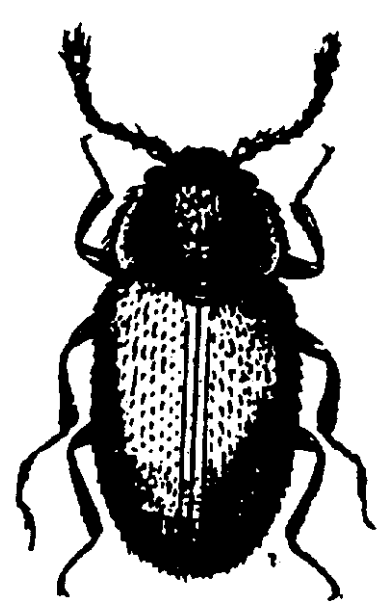
Figure 3-12.



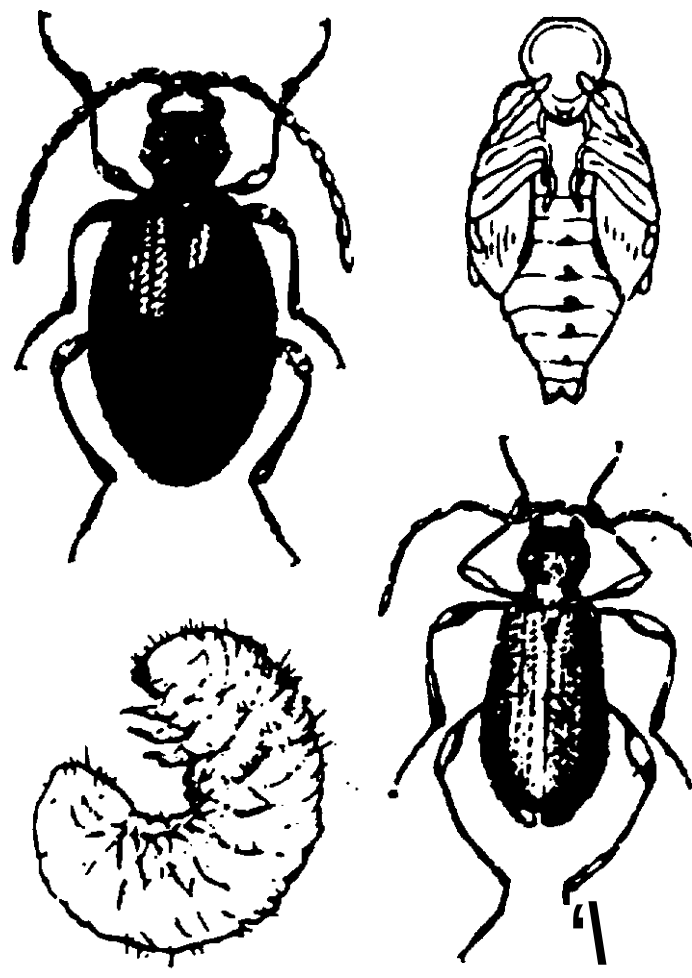
LESSER GRAIN BORER



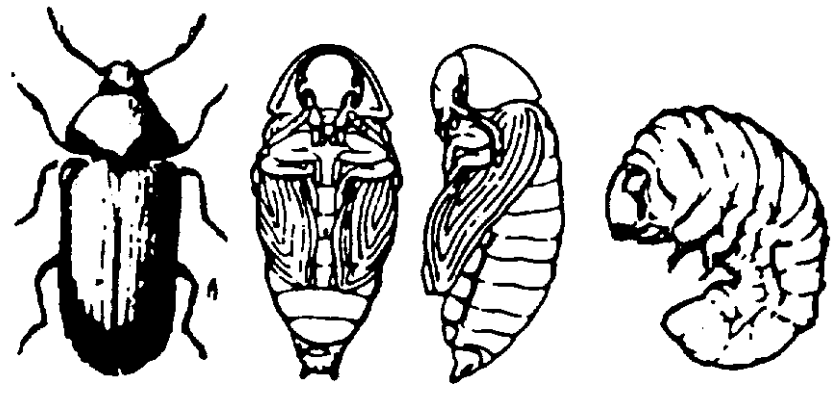
BROAD-HORNED FLOUR BEETLE



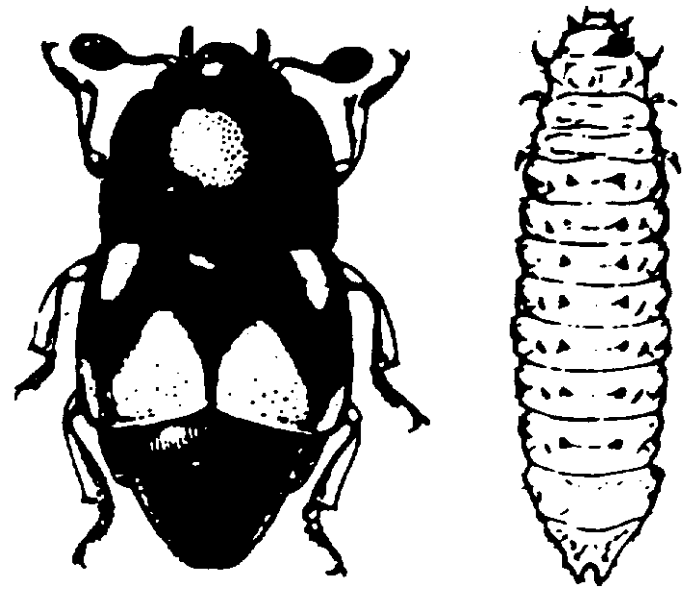
CALIFORNIA FUNGUS BEETLE



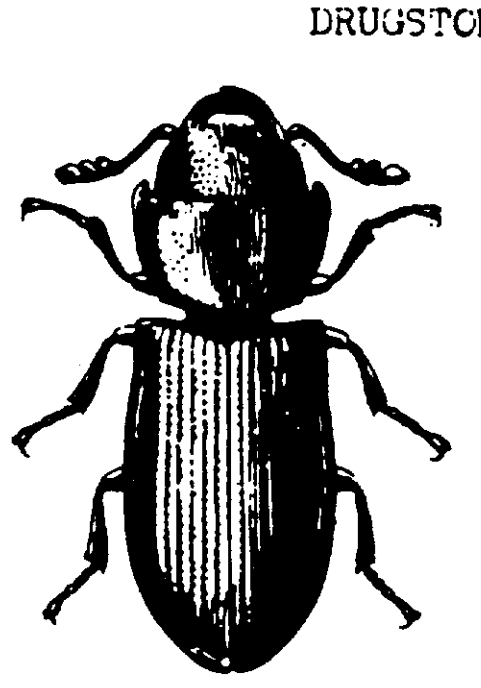
SPIDER BEETLES



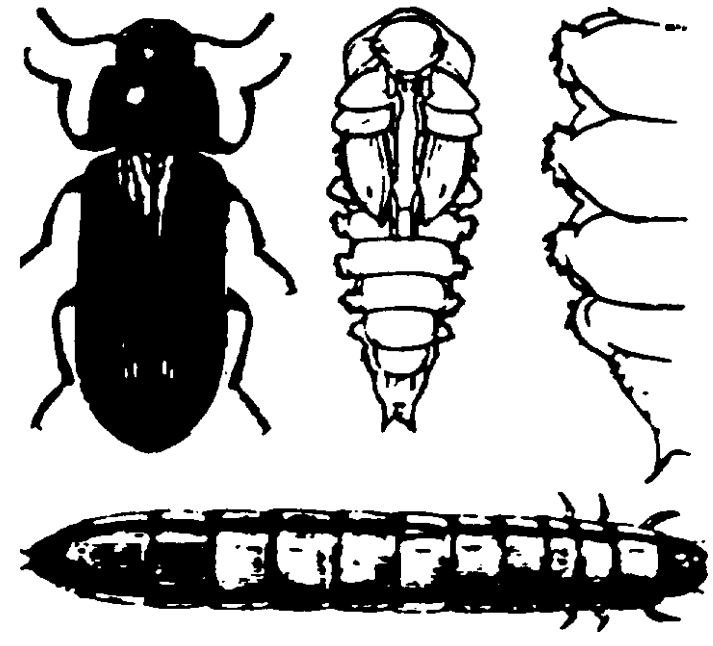
DRUGSTORE BEETLE



DRIED-FRUIT BEETLE



CADELLE



MEALWORM

Figure 3–13.

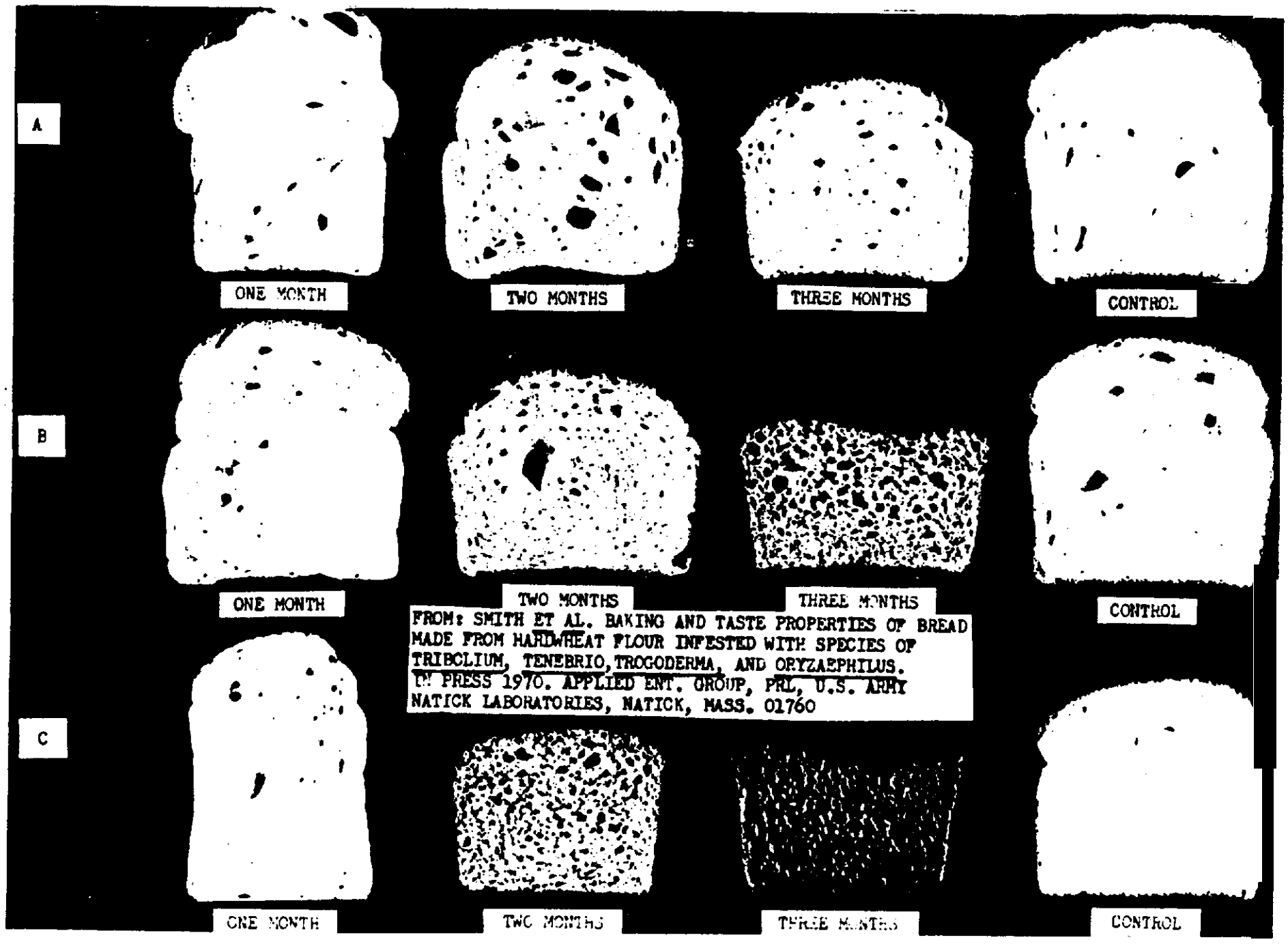


Figure 3–14. Slices of bread made from flour previously infested by flour beetles for periods of one. two and three months as follows: A—Tribolium confusum, ebony strain, 50 adults per replicate; B—Tribolium castaneum, 50 adults per replicate; and C—Tribolium castaneum, 100 adults per replicate.

free from contamination as well as free from hazardous and dangerous articles is not licensed to treat these returns lightly. The recommended procedure, in the case of subsistence, is to fumigate prior to placement in the warehouse when such returning material must be accepted.

(1) Hazardous and dangerous articles have been detected in cargo classified as general cargo. These articles (e.g., ammunition shells, bombs, poisonous gases) must not be introduced inadvertently into the United States or other nations.

(2) Normally every precaution is taken at point of foreign origin to assure that hazardous articles are not included in shipments of general cargo and that the shipment is free of contamination. However, an intensive, continuous, and aggressive public health and agricultural quarantine program must be carried on in all United States Armed Forces operations throughout the world involving retrograde cargo.

(3) To provide safeguards, inspections uncovering the presence of dangerous and/or hazardous material will be reported expeditiously. This includes the inspection of these materials in retrograde cargo as the presence of quarantinable rodent and/or insect infestations including prohibited packaging materials such as native grasses, mattresses, etc.

(4) The report, as a minimum, should identify the shipper, type of cargo affected, probable cause of the situation (if known), immediate corrective action taken, and any additional information considered applicable. The report should be submitted to the Armed Services Explosive Safety Board (ASESB) or the Armed Forces Pest Control Board (AFPCB) as appropriate (DODI 4500.35).

(5) Returned material found, or suspected, to be contaminated by hazardous material or pest infestation will be placed in an isolated area and will be treated as prescribed herein before being sent through the processing area.

d. *Inspection while in storage.* Storage facilities and exteriors of ingestible material will be inspected at regular intervals by trained and qualified pest control personnel. The ingestible contents of such products will be inspected by veterinary, food, or qualified subsistence quality assurance inspectors. The storage activity's insect and rodent control personnel and the inspection specialists should perform a joint monthly inspection of vulnerable stocks and storage areas. A report should be prepared on each inspection to show the results thereof and recommended action. Inspection personnel will be provided with required equipment such as flashlight, magnifying glass, hand sifter and grain thief. Visual and spot inspections should be accomplished at the storage stack. A central inspection area should be available for the performance of more thorough and extensive examinations.

e. *Inspection of outbound shipments.* Supplies will be visually inspected at time of outbound shipment. The car or truck will also be inspected prior to loading for evidence of insects and rodents. Cracks and ruptures in car and truck interiors provide a good harborage for insects. Due to the condition of the car interior, climatic conditions, and type of pack, it may be necessary to provide for intransit fumigation of the carrier.

f. Inspection procedure for subsistence. Advanced infestation in bagged, domestic pack subsistence can usually be readily detected by a visual inspection. To detect infestation in an earlier stage, or to any degree within a multiwall bag, it is necessary to open the bag and sift sample lots of the contents. A hand sieve with catch pan is required for this operation. Recommended for this purpose is sieve, sifting, 8- or 12-inch diameter, No. 10 mesh, or locally made sieves which utilize an 8XX bolting cloth as the screening material for flours. A No. 8 mesh sieve or locally made sieves which utilize normal window screens may be used for bulk items such as macaroni or beans. Mechanical sifting equipment will be made available when workload warrants. More specific details for inspecting insect-infested subsistence are provided in MIL-STD-904, Guidelines for Insect Infestation of Subsistence.

(1) The seams and ears of the bags will be carefully examined for evidence of insect infestation. The top layer of stacked subsistence is the most vulnerable area affected by bird droppings, and will be inspected frequently when it is known that birds are entering warehouses.

(2) Containers of spices, pepper, dried milk and other finely divided subsistence stocks will be selected at random, emptied and sifted.

(3) Spaghetti, macaroni, and cereal products will be visually inspected and then sieved for insect and rodent infestation. .

(4) All paperboard and other nonmetal containers will be checked" for areas damaged by rodents and the contents inspected for evidence of insects. Under some circumstances it may be desirable to incubate a sample of the commodity to determine the presence of immature stages of insects.

(5) All other ingestible subsistence will be inspected by visual and/or open container examination as prescribed by the material manager.

g. *Inspection procedure for textiles, textile products.* Treated woolen clothing, blankets and similar items in compressed bales are seldom affected by insects. Insecticide vapors are trapped within the bale for long periods of time due to the type of packaging. Wooden boxes and fiberboard containers do not afford similar protection. Sample lots of items should be selected at random, removed from the containers and examined for evidence of moths, larvae, silverfish, and other destructive pests. Folds and seams particularly should be carefully inspected. Naphthalene flakes or other insecticides will be replenished at time of inspection. Wearing apparel fabricated from textiles that have been treated with an insecticidal repellent within the last two years is not normally susceptible to insect infestation. These stocks can be identified by labels on the exterior of package captioned "moth-icicle. "

h. Inspection Procedure for Wood Products. Powder/post beetle infestation can be readily detected by the presence of wood dust and small holes in the stock. Shipments received from tropical areas are particularly prone to this type of infestation. All types of hardwood items without protective treatments are subject to attack by this insect, e.g., furniture, craft items, tool handles, wooden equipment parts and pallets. When inspecting canvas

folding cots, the side rail concealed by the canvas slip-on should be carefully examined.

(1) Termites are the most destructive insect pests at military activities. They may damage a building so severely that condemnation and replacement are required., They eat wood and other cellulose products such as paper, cardboard and fiberboard, and will destroy structural timbers, pallets, crates, boxes, tool handles, furniture, books, and other wood products and even cotton products. In attacking packaging or crating in storage areas, they will seriously damage stored items such as nylon parachutes and woolen clothing. All structures built wholly or partially of wood should be inspected at least annually for active termite infestation regardless of preventive measures employed in construction. Attention must also be given to those conditions conducive to further termite attack.

(2) The installation engineer *or* public works officer will assist the storage officer in the inspection of lumber and other forest products for infestation by insects and wooddestroying fungi. Infested timbers will be treated with approved pesticides; depot stocks of wood products will be treated to prevent further infestation and damage when infestation conditions exist.

i. *Inspection procedures and control measures for household goods.* Items of household goods susceptible to attack by insects should be carefully inspected immediately prior to packaging. The appropriate insecticide or repellent should be applied during packaging and packing operations. The exterior of the boxes and packages should be inspected upon receipt at warehouse and at regular intervals while in storage for indications of insect and rodent infestation. If infestation is detected, the box or package should be fumigated using the atmospheric pressure method only. Boxed or crated household goods must not be vacuum fumigated. The entomologist or a certified pest control operator especially trained in fumigation techniques should prescribe the fumigant and the method of fumigation. Storage areas for household goods should be sprayed at regular intervals with residual sprays.

(1) As required, the installation engineer or public works officer will apply appropriate control measures for eliminating infestations in household goods and furniture that are in use.

(2) Household goods will be inspected immediately prior to packing and crating for storage and shipment. When infestation is found, appropriate control measures will be applied.

3-408. Housekeeping

Proper housekeeping practices are essential for the protection of supplies in storage. Floors, containers, materials handling equipment, storage areas, pallets, and other storage aids must be clean and free of any substances that will attract, provide food for, or harbor insects, birds, and rodents. Tears and ruptures in sacked and boxed subsistence must be closed with a patch or repackaged. Dead rodents, birds, and other pests should be removed from the storage area. Rodent proof garbage and trash receptacles in sufficient numbers will be provided and their use enforced. Removal of all garbage and trash should be accomplished at least weekly.

3-409. Insect Control Measures

Control programs for insects and related pests at military installations will provide for the application of preventive as well as direct measures. An economical and effective control program requires, among other things, the selective use of spraying, dusting, fumigation, insect proofing, the use of wood preservatives, drainage, poison baits, the elimination of breeding areas, and the practice of good sanitation. Inasmuch as there are several hundred species of pests of stored products which may require one or more control methods, the specific information regarding choice of treatment, safe application, formulation, and operational guidelines will be found in the tri-Department technical publication, Insect and Rodent Control (TM 5-632/AFM 9-16/NAVFAC MO-31O) and Rodent Control (TB MED 144/NAV-MED P-5052-26/AFM 161-3). Additional technical assistance required should be requested from the appropriate command or area entomologist.

a. Personnel for application of insecticides. The application of insecticides and similar chemicals will be made by personnel trained and certified in their safe and effective use as required by DOD standards for insect and rodent control operations. The entire control program will be supervised by trained and DOD certified personnel qualified to determine requirements and program effectiveness. Environmental pest control measures in the peripheral civilian community will be supported and encouraged.

b. Low temperatures. Subsistence items susceptible to insect infestation are not normally adversely affected by prolonged periods of low temperatures, O°F through 32°F. Insect activity at such temperatures is arrested or substantially retarded. Textile, wood items and ingestible subsistence should be stored in unheated warehouse sections when space and storage conditions permit. Temperatures lower than O"F maintained for a minimum of two weeks will normally be required to kill insect eggs.

C., *Fumigation and treatment.* Fumigation will normally produce satisfactory insect kill when the ambient temperature and temperature of the stock is 60"F and higher. This operation will not adversely affect items of subsistence or other types of stock, when directions on the fumigant label are followed, When infested processed ingestible subsistence must be fumigated, the fumigant of choice is aluminum phosphide. Under unusual circumstances, other fumigants might be required. However, fumigants other than aluminum phosphide will not be utilized unless they are recommended by the area command or district (applied biologist) entomologist. Also, there is no residue generated to provide continued protection following fumigation. Therefore, fumigation stocks should be stored in an area that has been sprayed previously with a residual insecticide. With the exception of subsistence items, fumigation by vacuum chamber is an effective and efficient method. A high degree of penetration into the interior of the item is achieved by most fumigants making unnecessary the opening of bales, boxes, multiwall bags, and similar type of packs.

(1) Stocks can be fumigated satisfactorily under tarpaulins, in sealed atmospheric chambers, boxcars, and vans.

(2) As a precautionary measure, processed subsistence items susceptible to insect infestation may be fumigated with hydrogen phosphide upon receipt when ambient air temperatures exceed 50°F. However, any such preventive type of fumigation should only be conducted with the concurrence of a command or district (applied biologist) entomologist.

(3) Stocks in storage found to be infested must be fumigated as early as practicable to prevent further contamination.

Note: Boxed and crated household goods will not be vacuum fumigated. Other methods of fumigation are authorized. Also, processed subsistence items will not be fumigated with methyl bromide. Repeated fumigation with methyl bromide will result in a buildup of inorganic bromide residues which can exceed FDA established tolerances.

d. Dosages and exposure times. Vacuum chamber fumigation dosages and exposure times will adhere to the label instructions of the fumigant utilized. For fumigants recommended use in vacuum chambers, consult the appropriate area, command, *or* district (applied biologist) entomologist.

e. *In-place atmosphere fumigation.* (The Armed Forces Pest Control Board Technical Information Memorandum No. 11, Hydrogen Phosphide Fumigation with Aluminum Phosphide). Processed subsistence items that become infested can be effectively fumigated in place when covered with lightweight polyethylene film. The fumigant of choice for this method is phosphine gas which is generated from aluminum phosphide. Aluminum phosphide in the presence of atmospheric moisture produces phosphine or hydrogen phosphide gas. The effects of this gas upon ammunition items are not well known, but are under study. Until these studies have been completed and this section revised, this method of fumigation is not permitted for ammunition, explosives and related metal parts. The penetration characteristics of this gas are of a particular advantage since it can be used effectively with all t ypes of pack (hermetically sealed glass or metal excluded).

(1) In-place fumigation can be conducted without moving the commodity. Sufficient space (normally 24-36 inches) must be provided between stacks of different ingestible subsistence and the stacks and all walls to obtain the minimum polyethylene tarp overhang of 18 inches on the floor and to facilitate inspection of material. Such fumigation must be conducted by certified pest control personnel in strict accordance with the Armed Forces Pest Control Board's Technical Information Memorandum No. 11.

(2) Hydrogen phosphide (phosphine) gas is explosive under vacuum conditions; therefore, the use of aluminum phosphide is restricted to atmospheric fumigation in a closed space or under a polyethylene paulin. Phosphine fumigation should be conducted only by specially trained and certified pest control personnel.

f. Vault fumigation. Vaults for the fumigation of supplies may be constructed of wood, concrete, brick, or of wood frame with sheet metal lining. Clothing, furniture, and wood products can be effectively fumigated with methyl bromide to elimi-

nate insects. Phosphine can be used with food products, These vaults must be sealed to prevent the escape of the fumigant during exposure. Equipment should be provided for applying the methyl bromide or aluminum phosphide *after* the vault is loaded and sealed, and an exhaust fan installed to aid in the aeration of the treated supplies and the vault. For specific dosage information refer to the methyl bromide label. The rectangular steel chambers normally used for vacuum fumigation may be utilized as a vault for the fumigation of crated household goods (furniture), or other commodities that might be damaged by" high vacuum. When utilizing these chambers for atmospheric vault fumigation, an initial vacuum of *5* inches should be placed on the chamber in order that the dosage of methyl bromide will readily flow from cylinder through volatilizer into the chamber.

(1) Aluminum phosphide will not be used in vacuum fumigation.

(2) Installations having vacuum fumigation chambers will, upon request, fumigate commodities of other DOD or Governmental agencies. Agencies requesting vacuum fumigation of commodities will transport their property to and from the treatment chambers.

g. Carrier *equipment* fumigation. Rail cars and vans or trucks indicating infestation at time of receipt should be fumigated prior to unloading in order to reduce the mechanical transfer of insect populations into military storage facilities.

(1) If the loaded carrier equipment is in good state of repair, effective fumigation can be accomplished by introducing aluminum phosphide in accordance with MIL-STD-1486.

(2) Under no condition will any residue of a formulation containing aluminum phosphide be allowed to come in contact with processed foods.

h. In-transit fumigation. When directed by higher headquarters or when previous arrangements for clearance of the fumigant have been made with the installation due to receive a rail car shipment of ingestible subsistence, in-transit fumigation must be accomplished, This fumigation can only be applied by DOD certified pest control personnel and must be in accordance with MIL-STD-1486.

i. *Receipt of fumigated carrier* equipment. Rail cars/vehicles received displaying fumigation warning signs will be serviced by trained and certified pest control personnel. Cars received in less than 72 hours from introduction of the fumigant should not be entered without chemical canister mask approved for use with the fumigant involved, or self contained breathing apparatus. Dust respirators will not be used for this purpose. Cars received with more than 72-hour fumigation can safely be cleared by certified pest control personnel.

(1) If an in-transit fumigation shipment is received and the pest control personnel determine that such shipment has been inadequately fumigated or envelopes are missing, contact the area or command entomologist for technical advice and the Directorate of Subsistence, Defense Personnel Support Center, for advice on disposition of the ship ment prior to off-loading of products.

(2) Fumigated subsistence will not be consumed until at least 48 hours after unloading from freight cars.

j. Space *fumigation. The* fumigation of warehouses, and other large spaces, requires technical assistance. Commercially owned vessels will be fumigated under the regulations and supervision of the US Public Health Service. The services of the cognizant command or area entomologist are also available for Government-owned vessels.

(1) Adequate preparation should be given to the space to be treated. Windows, doors, skylights, and other openings should be wedged and sealed and all broken window panes replaced. When the space to be fumigated is properly sealed, the fumigant should be applied in compliance with the label instructions for the fumigant utilized.

(2) Methyl bromide, when recommended for space fumigation, is utilized at a dosage of 1 pound per 1,000 cubic feet of space with exposure of 12 to 24 hours.

(3) Methyl bromide will not be used for processed subsistence fumigation. When using methyl bromide, make certain no food items (other than cans or hermetically sealed glass) are within the space to be fumigated. Aluminum phosphide can be utilized for space treatment of subsistence warehouses, but should only be conducted under the supervision of an entomologist.

(4) Adequate provision must be made for aeration at end of exposure to prevent workers from being exposed for extended periods to concentrations of any fumigant.

k. Residual insecticide sprays. Residual insecticide sprays should be used to provide long-lasting protection to noninfested stocks or to prevent the spread from previously infested materials. Residual

insecticides should be applied on walls, floors of bays, and pallets. Only residual insecticides recommended by the Armed Forces Pest Control Board specifically for subsistence storage areas will be utilized in subsistence storage facilities. The insecticide of choice for such residual application, as well as dosages, application rates, and frequency of application, must be determined by the area or command entomologist.

l. Space insecticide treatments. In areas of such operations as subsistence repackaging or ration breakdown points," it normally is necessary to use insecticides having very light residual, effect and minimum odor or staining properties. These are used as "space treatments" and achieve a quick knockdown effect and temporary control. Consult the area or command entomologist for pesticides and methods of application authorized in such areas. Insecticide, pyrethrum, liquid form, 0.4 percent pyrethrin, 1.6 percent synergist (NSN 6840-00-400-2140) is available for application as a space insecticide treatment.

(1) The application of approved pesticides, such as 5 percent dichlorvos, in warehouses used for the storage of processed/packaged subsistence on a regular preventive basis is the most effective method of preventing the spread of insect infestation within storage facilities.

(2) A dispenser, insecticide, stored products automatically controlled emission (SPACE) 11 (NSN 3740-01-01%4557) is used to disperse the pesticide in large warehouses. One dispenser is required for each million cubic feet of warehouse space (fig. 3–15).

(a) The machine is placed in a warehouse at the end of a work day and setup by a qualified pest control operator.

(b) The machine automatically turns on and dispenses its insecticidal dose during the peak activity period of the stored products pests at night. The dispenser will automatically shut off after operation.

(c) Buildings being treated will be closed and all nonessential ventilation shut off during the treatment period. All entrances will be locked and protection signs posted at all entrances. Unprotected workers will not be allowed to enter buildings under treatment.

(d) Pest control personnel will open the building and turn on ventilation systems 30 minutes before other workers are allowed to enter the building.

(e) Warehouses-containing insect susceptible supplies will receive a pesticidal space treatment once each week or as recommended by the area *or* command entomologist, when the commodity temperature is above 50"F or the air temperature is 60°F or above.

m, Dip or soak insecticide treatment. Wood products such as tool handles, pallets, ladders, gun stocks, and similar items should be protected from wood destroying insects by use of dip or soak insecticidal treatments. These treatments can be made by the use of tank or vat type receptacles which permit complete immersion of the desired quantity of wooden items for a period of 3 minutes or longer. Insecticides give effective long lasting protection against more insects affecting wood in storage. Where it is desired to provide protection against both insects and fungi, pentachlorophenol, preferably with a water repellent added, has proven effective. Only certified pest control operators utilizing pesticides as recommended by the area or command entomologist will perform application of these pesticides.

3410. Rodent Control Measures

a. General. The Armed Forces are concerned with rodents primarily because these animals act as reservoirs of some of the most serious diseases affecting man. The economic aspects of a rodent infestation are also considerable. The monetary losses encountered through consumption and contamination of foodstuffs and through damage to buildings and property amount to millions of dollars annually. Rodent control work should be regarded as a continuous program with a sustained effort to eliminate the causes of infestation rather than one of recurrent intensive campaigns, Satisfactory rodent control is dependent on the elimination of food and shelter. The control program will include removal of food and water supply, elimination of shelter, rodent proofing structures and eradication by trapping, poisoning and burrow fumigation.

b. Evidence of infestation. Observation of rat signs is essential in ascertaining whether rats currently infest buildings, in determining the degree of infestation, and in planning an effective control program. These signs are droppings, runways, rub marks, tracks, burrows, nests, damage, rat odor, rat hairs, live rats, dead rats, and damage to stored products. Talc as a tracking patch, can be used to identify active infestations,

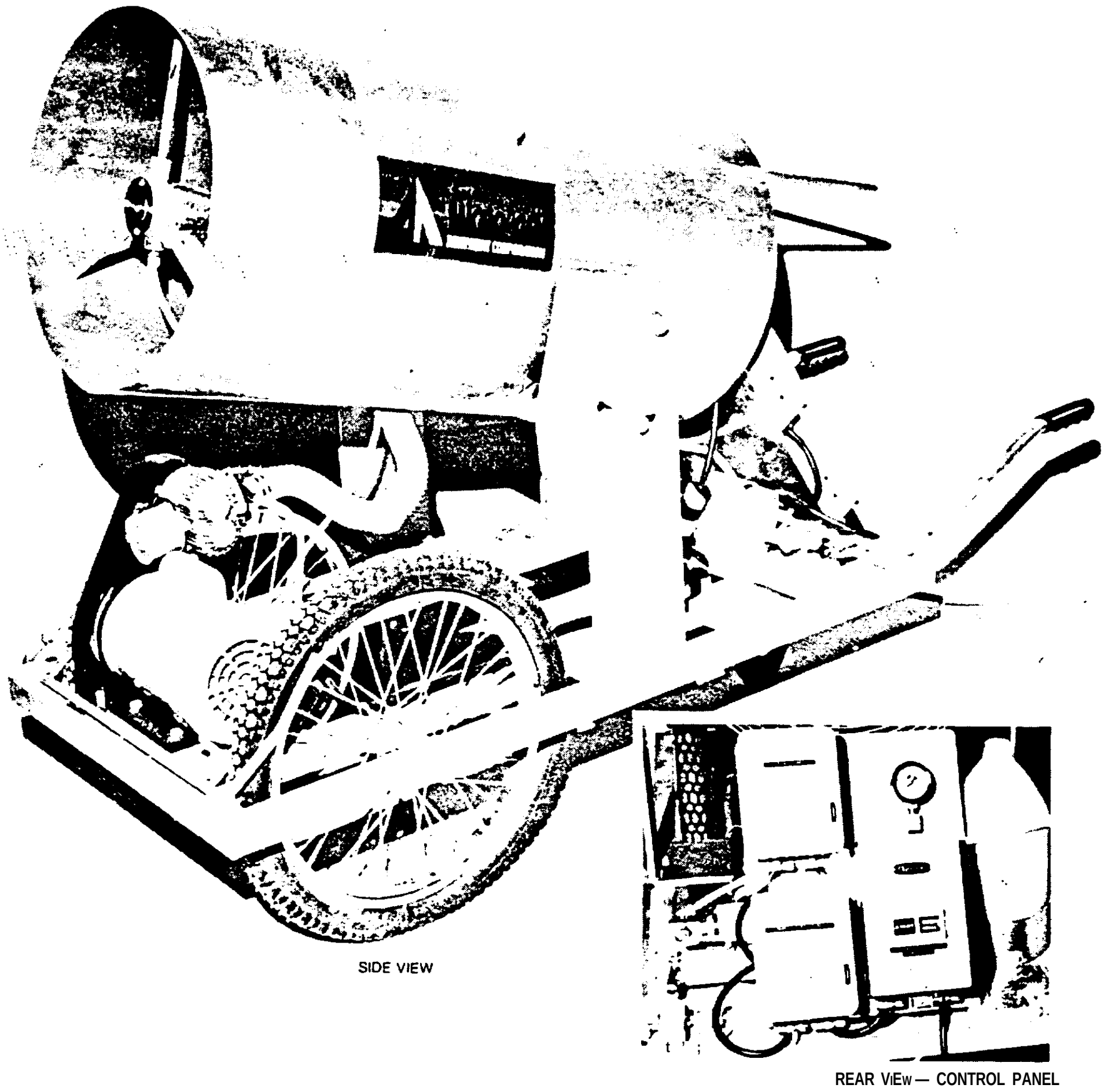


***Figure 3–15. Space** II—Insecticidal **dispenser used** for space treatment* in large warehouses.

c. Elimination of food and shelter. The primary factors influencing the degree of infestation are the amounts of food and harborage available. Few rats are found in buildings where food is not handled. The cleanliness of an establishment is a most important factor affecting the number of rats which may be present. When waste food is piled on the floor, in open cans, or other unprotected sites, little *additional* evidence is needed to show that the site will support rats. Rat infestation can usually be traced to unsanitary conditions, consisting chiefly of 'infrequent refuse collection and inadequate disposal practices. General sanitation as a rodent control measure includes primarily a planned and continuous program of collection and disposal of debris, rubbish, and garbage, and the proper stacking of food supplies. Such practices reduce available food and harborage for rats.

d. Erection of barriers. Ratproofing of existing buildings for prevention and control of rats is sometimes necessary. Sheet metal of 26-gauge or heavier, ¼-inch mesh hardware cloth, and concretes are suitable materials for use in ratproofing. Openings of sizes that will permit entrance of rats and mice to the intenor of warehouses should be closed. Other openings, such as cracks around doorways, gratings, and windows less than 4 feet above the ground through which rats may *enter* directly or by enlarging the opening should be covered with %-inch mesh hardware cloth or other suitable ratproofing material. Openings around boxed-in piping and wire conduits should be closed. Conduits for wiring should be closed and limited, if possible, to sizes that will prevent passage of rats and mice. Fire stops in double walls and floors of wood construction should exclude potential rat runways along beams, and spaces between walls should be blocked. Doors should be self-closing and fit tightly. Wood sills and doors at ground level may be sheathed in sheet metal to withstand gnawing.

e. *Application of poison baits.* The most economical means of effecting wholesale destruction of rats and mice is the use of poisons (rodenticides). Because most of these poisons are toxic to man and domestic animals, the use of baits at military installations should be properly directed and supervised. Rats vary widely in food preferences. These preferences may be ascertained by observing the type of food scattered about the harborage as well as by test baiting. It has been observed that an average adult rat may require approximately three-fourths to one ounce of dry food and from one-half to one ounce of water in a 24-hour period. Because the requirement for water is an urgent one, water is an effective bait in itself. If other sources are denied to the rats, the attractiveness of all food and water bait is greatly enhanced. Bait boxes or feeding stations may be used, when necessary, to protect poison baits from weather and to safeguard *installation personnel, children,* and domestic animals.

f. Fumigation. Calcium cyanide fumigation will destroy rats in their burrows outside of buildings. This material (NSN 6840–00–264–6684) is a grayish-white granular powder which produces hydrocyanic acid gas (hydrogen cyanide (HCN)) almost instantly upon exposure to the moisture or air. *It kills very quickly and both the dust and the liberated gas will kill man and the other animals including insects.* Although safe when properly done, calcium cyanide fumigation is a hazardous process and must be done only by trained personnel. Fumigation should never be attempted in burrows extending under occupied buildings or closer than 15 feet from a building. Personnel will be required to wear chemical cartridge respirators approved for use with this type fumigant.

g. *Use of traps.* Trapping is recommended for use in those places where it is not advisable to use poison bait or gas. In trapping rats, the proper placement of the traps is far more important than is the selection of bait. Rats follow natural runways whenever possible. There instinct for stealth and protection causes them to travel behind anything that is placed near a wall. The best baited trap will rarely entice a rat into the open. When a trap can be set behind objects which are stacked close to the wall or behind a board that is leaned against a wall, it will be much more likely to lure a rat into investigating it.

(1) Rats quickly become "trap wise," necessitating frequent changes in setting and bait. Traps require servicing daily and sometimes twice daily. Traps should be cleaned whenever necessary to ensure efficient operation. It is not necessary to avoid handling traps nor is it necessary to wash or sterilize them since human odors or odors from previously caught rats do not deter rats from approaching them.

(2) Baits may be any foods attractive to rats. The baited traps should be placed near, but not in rat runs because rats prefer to investigate food and

may be wary of obstructions in their runways. Traps near a wall or other vertical surface should be placed about 1 foot from and at right angles to the wall with the hair-trigger toward the wall. Thus, a rat running along the wall from either direction, in leaving the run, will go straight for the bait on the trigger. It is desirable to vary the bait every few days and switch to an entirely different type.

h. House mice. Control of house mice may be accomplished in much the same manner as that described for rat control; namely, trapping and poisoning. The snap traps used for mice control are much smaller than those used for trapping rats and usually result in' better catches when baited with peanut butter, bacon, or oatmeal. Traps must be spaced closer together for mice than for rats since the normal range of mice is only 10–30 feet from their nest.

i. *Field rodents.* The methods for control of field rodents vary according to the type of animals and the conditions under which they live. Technical assistance in the control of field rodents may be obtained from the cognizant area, command or district (applied biologist) entomologist, Federal, State, and County agencies" in the United States and corresponding agencies in foreign countries.

3–411. Bird Control Measures

The following procedures are recommended in controlling pigeons, English sparrows, European starlings, and other bird pests in and about storage depots. Each instance where pest birds are a problem is unique. The area or command entomologist should be consulted on any bird problem, but must be consulted prior to the use of any reduction measures.

a. *Preventive measures.* Keep the ground around the storage area free from spilled grain and other food. Remove spoiled grain and other waste food from the premises and use covered receptacles to hold waste food material that is carried for a period of time.

(1) Stored supplies in warehouses can be protected from bird droppings by placing weighted brown paper on top layer of stacks or by covering with a 2-mil polyethylene film.

(2) The use of mesh wire to prevent access to building or roosts should be a major consideration in bird control. Screen all windows, ventilation, etc., with wire mesh no larger than three-fourths of an inch. Small doors that remain open should be fitted tightly with screens equipped with suitable springs. Large doors which must remain open pose a special problem. Due to the relatively few alternatives, the area or command entomologist should be contacted for specific recommendations.

(3) Roosting can be permanently prevented by installing aluminum or galvanized iron sheeting at a 45° or greater slope on the exterior ledges of buildings. Temporary measures to discourage roosting include the use of glue on ledges and copings, electrical devices to produce shock and sharp-pointed wires in the form of spike fences. These methods or devices may require frequent servicing for best results.

b. Reduction measures. Bird populations maybe reduced by destroying nests and eggs during the spring and summer and by trapping and poisoning. Population reduction efforts should be coordinated with the birds' reproductive cycle(s) and seasonal movements.

3-412. Reclamation or Disposal of Infested Stocks '

After infested stock has been fumigated or otherwise disinfested, it should be carefully examined for fitness for human consumption or serviceability by the supporting veterinary or appropriate medical authority. Contaminated iterns of subsistence should be rendered unfit for human consumption, salvaged for animal food or, if more appropriate, destroyed by burning. (Denaturing can be achieved by the application of a colored fish oil or coal oil.) Cloth or subsistence items not heavily contaminated and which do not have an off-color or odor should be considered for rebolting or rescreening and returned to stock. If the insect infestation has been light and detected at the onset, rebolting of cloth before returning stock to storage may not be necessary. In each instance, technical advice prior to disposition of the affected stock should be obtained from specialists referred to above, the military service vested with staff supervision, the veterinary food inspection service, the medical officer, or the local representative of the US Food and Drug Administration. If rebolting or rescreening equipment is not available at the storage activity, commercial facilities should be utilized.

3-413. Storage of Pesticides and Sanitary Requirements

a. General. Pesticides used at military installa-

tions can be stored and handled safely by trained and certified personnel following label instructions and procedures recommended by the area or command entomologist. These materials are toxic to humans and animals and certain items are particularly dangerous if used or handled carelessly or improperly. Accordingly, it is essential that appropriate measures be taken to prevent accidental and deliberate access to these materials by unauthorized personnel. Proper storage is also essential to protect and prolong the life, of the equipment.

b. Toxic materials. Areas in which toxic materials are stored and mixed should be enclosed and secured to prevent access by unauthorized personnel. Storage space should be located so there is no danger of food contamination or fire hazard. Ventilation is required.

c. *Facilities.* In addition to providing for the safe storage of toxic materials, pest control shop space should have facilities for the protection of personnel and the safe mixing of materials. Showers and washing facilities will be readily available near the mixing area for the use of personnel. Minimal pest control facility criteria are set by each Service; contact the area or command entomologist for guidante. Food will not be consumed in storage and handling areas. Separate lockers for work and street clothes will be provided.

d. *Transportation.* Vehicles utilized for the transportation of pesticide supplies will be provided with locked compartments to eliminate the possibility of unauthorized persons gaining access to toxic materials.

e. Disposal. The area or command entomologist will ensure that excess or deteriorated fumigants or pesticides remaining from fumigation *or* other pest control operations are properly disposed of in such a manner to avoid creation of hazardous conditions and potential environmental contamination. Criteria for selection of safe disposal methods include type of pesticide, formulation, amounts, containers, and geographical location. For facilities equipped with special high temperature (1800°F) incinerators or approved burial sites, disposal may be accomplished by the installation pest control technician if trained in disposal operations.

(1) In all other cases, the area or command entomologist must be consulted prior to any disposal action. Usable pesticides (fumigants, herbicides, insecticides, rodenticides, etc.) in unopened containers will be returned to the Federal Supply System.

(2) Damaged stocks determined to be reparable should be reported as prescribed by the responsible military service.

3–414. Training

a. Training and certification of operators.

(1) All *personnel* engaged in pest control operations will be trained and certified in accordance with policies and procedures established by DOD standards.

(2) Regular training courses will be provided to insure availability of trained and qualified inspectors and pest control operational personnel.

(3) Training of operational personnel will include:

(a) Safe storage, mixing, transportation, application, and disposal of pesticides, to include the proper first aid techniques for the pesticides to be used.

(b) Changes in techniques due to development of new and improved materials and equipment.

(c) Keeping records of all pest control operations.

(d) Identification of potential pest infestation problems and related information.

(4) A DOD certificate will be issued to operating personnel who successfully complete the required training.

b. Periodic training and recertification. The field of pest control is *ever* changing with development of new material and equipment, and with new research results ready to be translated into operational usage. These developments make it necessary for pest control personnel to receive periodic retraining. Training and recertification must be accomplished every 3 years.

3–415. Safety

a. *Pest control operations.* Pest control operations will be performed by or under the direct supervision of trained and certified personnel. A minimum of two pest control personnel must be present during fumigation operations.

(1) Protective devices such as masks, respirators, gloves, safety shoes, goggles and protective clothing will be provided for all persons engaged in pest control operations.

Note. Rubber gloves should never be worn with liquid fumigants, such as methyl bromide, due to the potential for skin burns resulting from spills. For some solid fumigants, such as aluminum phosphide, rubber gloves are required. Specific data on the wearing of the correct garments with fumigant can be obtained from the pesticide label or the appropriate area or command entomologist.

(2) Facilities will be provided for the minor repair of pest control equipment.

(3) Adequate provision for security of pesticides during transportation will be provided as necessary, e.g., special use vehicles, " locked chests.

(4) When a structure ordinarily utilized by humans is undergoing fumigation, large warning signs will be placed on all entrances to prohibit entry. Furthermore, one or more guards may be posted during the fumigation and aeration periods if deemed necessary by the area or command entomologist. Guards should be obtained from normal installation military or civilian police sources.

(5) The installation Medical Officer, Safety Officer, and fire department will be advised of the fumigant to be used and where and when fumigation will take place prior to beginning the operation.

(6) Respirators and gas masks will be used by all personnel who handle pesticides. When engaged in mixing or applying concentrated chemicals where dust, mists, or vapors are present, a combined dust and organic vapor type respirator will be worn. All respirators, gas masks, cartridges, and canisters utilized must be OSHA/MESA approved for the specific pesticide being handled.

(7) Individuals who handle pesticides must wear an approved respiratory device appropriate for protection against those pesticides. Paint respirators do not provide protection from pesticide vapors.

(8) During fumigation and in some phases of aeration, an OSHA approved full faced mask and canister or self-contained air pack will be used.

b. Protective clothing. Protective clothing and gloves (made of tough fabric with synthetic coating resistant to oils, greases, petroleum solvents, acids, corrosive chemicals and abrasive) will be used. Rubber latex gloves are also satisfactory.

(1) As indicated above, handlers of methyl bromide should not wear gloves. If they are used, trapping of the liquid or vapor under the gloves may result in chemical burns.

(2) Other protective clothing, such as coveralls or fatigues, must be worn by operators who handle concentrates or who are 'continuously exposed to insecticide formulations..

(3) Extra sets of coveralls or fatigues should be available to operators in the event clothing should be contaminated by spillage or other causes.

(4) If insecticides or a fumigant such as methyl bromide is spilled on the skin, it should be washed off immediately with soap and water. If clothing or shoes become contaminated they should be removed at once and a shower or bath taken. Methyl bromide will cause severe "burns" if allowed to contact the skin and remain there momentarily. This can occur in gloves, under watch bands, rings, etc. Gloves and other close fitting items should not be worn while handling methyl bromide.

3-416. First Aid Suggestions

a. General. The first consideration when an accident occurs, such as gross contamination of the body with concentrates or the inhalation of poison gases, is the removal of the victim from the toxic atmosphere or from other types of continued exposure. No matter what the nature of the poison, it is important to reduce the exposure. Anyone who has collapsed in an atmosphere of toxic gas should be removed to fresh air immediately. In the case of other exposures, decontamination should be carried out as soon as the condition of the patient permits.

(1) In the event of internal poisoning—

(a) If the victim has stopped breathing, clear airway and apply artificial respiration.

(*b*) Comply with the antidote and first aid treatments recommended on the label of the poisonous substance.

(c) If victim is unconscious, do not attempt to administer antidotes internally.

(*d*) If victim is cold, wrap in blankets but do not apply hot objects.

(e) Transfer victim to hospital.

(2) In the event of serious skin contamination—

(*a*) Remove all contaminated clothing and flood contaminated areas of skin with copious amounts of water.

(*b*) Follow this with a thorough washing with soap and water.

(c) Report to a physician for examination.

(3) In the event of poisoning by toxic gases-

(a) Remove victim to fresh air quickly. Personnel doing this moving will be equipped with ap-

propriate respiratory protection devices. If victim's breathing has stopped or is weak and intermittent, artificial respiration should be given promptly and persistently.

(*b*) If victim has been exposed to HCN, break an amyl nitrate pearl in a cloth and hold lightly under victim's nose for 15 seconds. Repeat five times at 15 second intervals.

(c) Remove contaminated clothing but keep patient warm.

.(d) Send for a physician.

(*e*) If, during *or* after methyl bromide fumigation, the individual should experience symptoms such as nausea and vomiting, dizziness, double or blurred vision, ringing in the ears, extreme fatigue, headache, loss of appetite, abdominal pain, impaired, blurred, or hesitant speech, or mental confusion, he or she should report immediately to a physician.

b. Symptoms of phosphine poisoning. The early reactions to phosphine poisoning are acute, obvious, and readily reversible.

(1) *Slight poisoning.* Sensation of tightness in chest and diaphragm, vomiting and diarrhea.

(2) *Medium to severe poisoning.* Dizziness, numbness and cold sensation in limbs, anxiety, sound of ringing in the ear, difficult or painful breathing, dry cough.

(3) *Serious poisoning.* Bluish coloration of the skin, muscular spasms, cardiac insufficiency, and coma.

(4) *First aid measures for phosphine poisoning.* Only persons equipped with appropriate respiratory protective devices should remove the victim immediately into the open; medical assistance should be called immediately. Treat as for shock—place victim in a recumbent (flat) position, with face turned to side and clear airway, if *unconscious*, and keep quiet and warm; apply oxygen breathing equipment, if available, or use positive pressure ventilation (mouth-to-mouth resuscitation), if necessary. Do not give any antidote-in particular, do not give any substance comprised of fats and oils (e.g., castor oil, butter, milk).

3-417. Effect of Pesticides on Aquatic Life and Wildlife

a. Improperly handled pesticides maybe carried by wind and water into adjacent or distant areas where they may contaminate wildlife. Unless basic precautions are observed, unnecessary injury is caused by drift of pesticides to wooded areas occupied by wildlife, drift to land area not intended for treatment and drift to fishbearing waters. Use of the more granular form or a coarse spray makes possible better control and less drift during application. Runoff or washoff by rain from treated areas to fishbearing waters must also be guarded against.

b. Pesticides differ as to their toxicities to mammals, birds and fish and their persistence in the environment. The addition of any persistent chlorinated hydrocarbon pesticide is likely to result in damage to aquatic life. Therefore, as concentrations of these chemicals increase in the aquatic environment, progressive damage will result. These compounds may persist unchanged for many years and consequently present a continuing threat to animal communities, The use of other kinds of chemical pesticides in or around surface waters may produce a variety of acute or chronic effects on fish or invertebrates. Because these other chemicals are usually not as persistent as the chlorinated hydrocarbons, some of them can be used around water, but only in amounts below those that produce chronic damage to desirable non-target species.

3-418. References

The information contained in this section is primarily for the guidance of operations supervisory personnel, specialists in care and preservation of supplies, and insect and rodent control personnel. Included is specific technical and practical information necessary to develop and maintain an adequate pest control program. Additional technical information is available in TM 5-632/AFM 9-16/ NAVIAC MO-31O; TB MED 144/NAV MED P-5052-26/AFM 161-3; the Armed Forces Pest Control Board Technical Information Memorandum No. 11, Hydrogen Phosphide Fumigation with Aluminum Phosphide, MIL-STD-904, and MIL-STD-1486.

Section 5. INVENTORY

3-501. General

a. To assist in achieving optimum economy in the management and use of DOD supplies, it is essential that accurate records of quantity, condition and ownership of the individual items be maintained. Periodic verification of these records is accomplished through physical inventory. In its most basic form, physical inventory is an actual count of an item at its storage site. In the broad sense, inventory of military property involves a number of actions other than a physical count of the material on hand. Some of these actions are the verification of stock record balances; the investigation, disclosure and analysis of cause of inventory discrepanaes; and the adjustment of stock records and financial records. This section is concerned primarily with the actions related to the physical count of material.

b. Certain items have characteristics which require that they be identified, accounted for, secured, segregated or handled in a special manner to ensure their safety or integrity. Because of these special considerations, inventory of such items is called a controlled item inventory. Controlled items are—

(1) *Classified items.* Material which requires protection in the interests of national security.

(2) *Sensitive items.* Material which requires a high degree of protection and control due to statutory requirements or regulations such as narcotics; precious metals; items which are of high value, highly technical or of a hazardous nature; and small arms, ammunition, explosives, and demolition material.

(3) *Pilferable items.* Material having a ready resale value, civilian utility, or application as to personal possession and are; therefore, especially subject to pilferage.

c. Department of Defense Instruction 4140.35, Physical Inventory Control for DOD Supply System Material, is the basic document DOD Components use to implement DOD inventory policies.

d. The DODI 4140.35 sets forth a minimum acceptable accuracy level for sample inventories below which a 100 percent inventory must be taken. The DOD Components may establish a more stringent accuracy level if deemed necessary. Only major discrepancies (see glossary of terms) are used to compute accuracy.

e. DOD Component activities submit a quarterly Report of Inventory Control Effectiveness (RCS DD-I&L (Q) 935) to the next higher headquarters. This report is used to assess inventory performance.

3-502. Principles of Inventory Control

Physical inventory procedures must provide positive control of "infloat" material and documentation. This control will include material release orders, receipts, adjustments, and catalog data changes. Mutually agreeable cutoff dates must be established between storage and accountable activities for inventory actions. Pre-inventory and post-inventory actions must be identifiable to ensure proper consideration in balance reconciliations. Effective inventory control must also include the following

a. Establishment of an inventory control organization to encompass all related inventory functions.

b. Establishment of training programs to develop optimum capability for the conduct of inventory.

c. Establishment and maintenance of accurate stock location records. See section 3 of this chapter.

d. Accomplishment of all directed physical inventories.

e. Adequate control over any movement of material undergoing inventory.

f. Accomplishment of required research prior to processing adjustment actions.

g. Isolation of causes of potential and actual discrepancies. Initiation of corrective action to prevent recurrence.

3-503. Inventory Planning

Each physical inventory must be planned, taking into consideration the following

a. Number of items involved.

b. Number of locations involved.

c. Manpower requirements.

d. Anticipated productivity.

e." Scheduling to obtain maximum efficiency and accuracy.

f. Preparation of material in storage to facilitate inventory counting.

3-504. **Inventory Training**

With the factors in paragraph **3-503** established, actual steps to accomplish the inventory should be outlined. Each individual participating in the inventory should be given a specific assignment. Prior to starting inventory actions, necessary training for all personnel involved, both military and civilian, should. be completed. Required training should be conducted through coordination of all organizational elements concerned. Suggested points for emphasis in the conduct of this training are—

a. Purpose of inventory.

b. Familiarization with the inventory organization and each participant's part therein.

c. Importance of attaining the highest degree of accuracy.

d. A thorough orientation in-

(1) Recognition and recording of correct stock number, nomenclature, and unit of measure.

(2) Item identification.

(3) Condition classification, such as serviceable, unserviceable, or other appropriate category.

(4) Counting techniques.

(5) Recognition of improper or unsafe material storage practices.

3-505. Preparation of Material for Inventory

Every effort should be made to arrange and maintain stored material in the best possible manner through application of proper storage practices. Prior to taking an inventory, stocks should be—

a. Properly identified and clearly marked.

b. Identified as a "Do Not Inventory" item, when these items are not to be included in the inventory count.

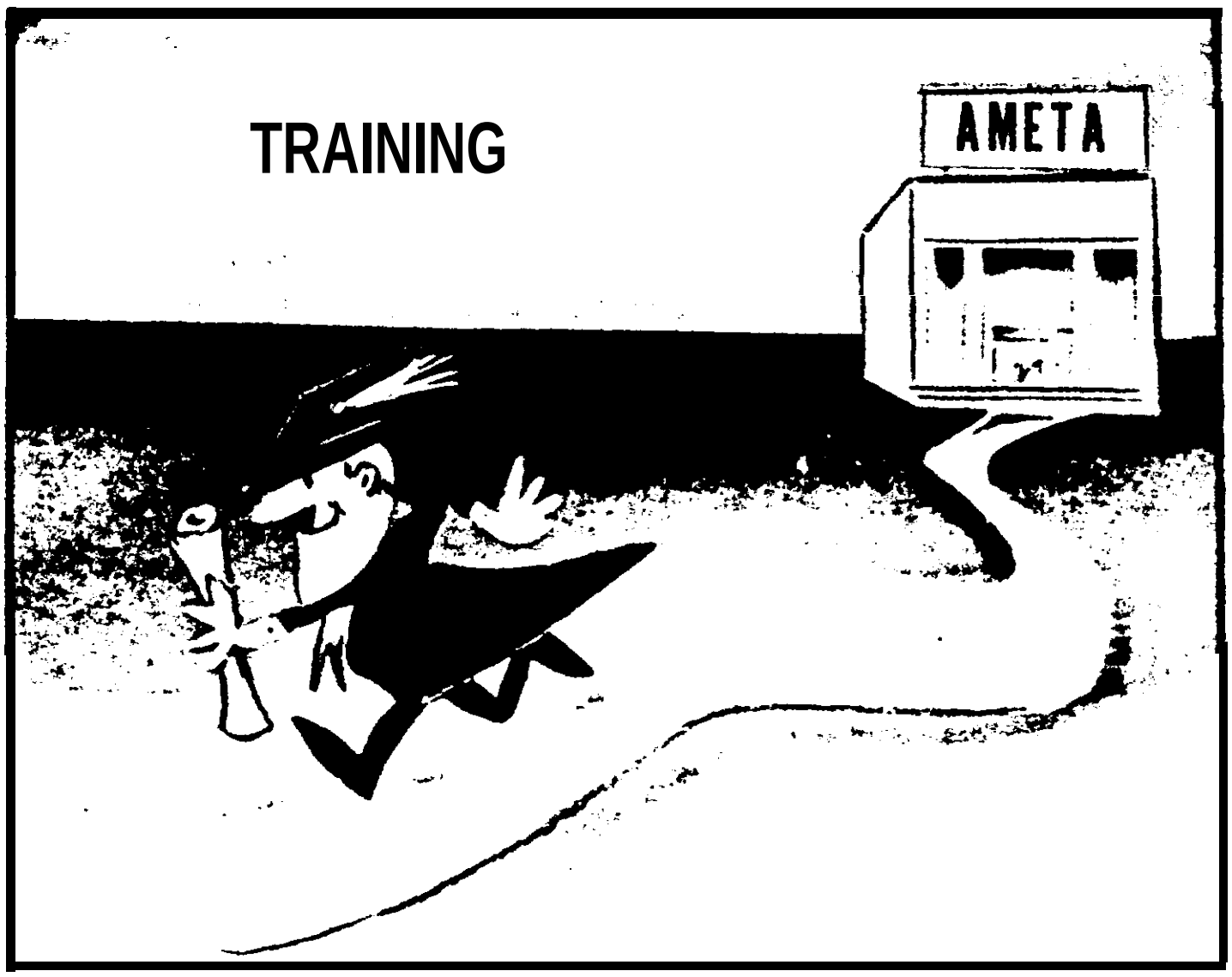
c. Stored in the minimum number of separate locations commensurate with proper storage practices.

d. Stored uniformly with respect to quantity per container and containers per pallet.

e. Clearly highlighted to show where conditions other than those in *d* above exist.

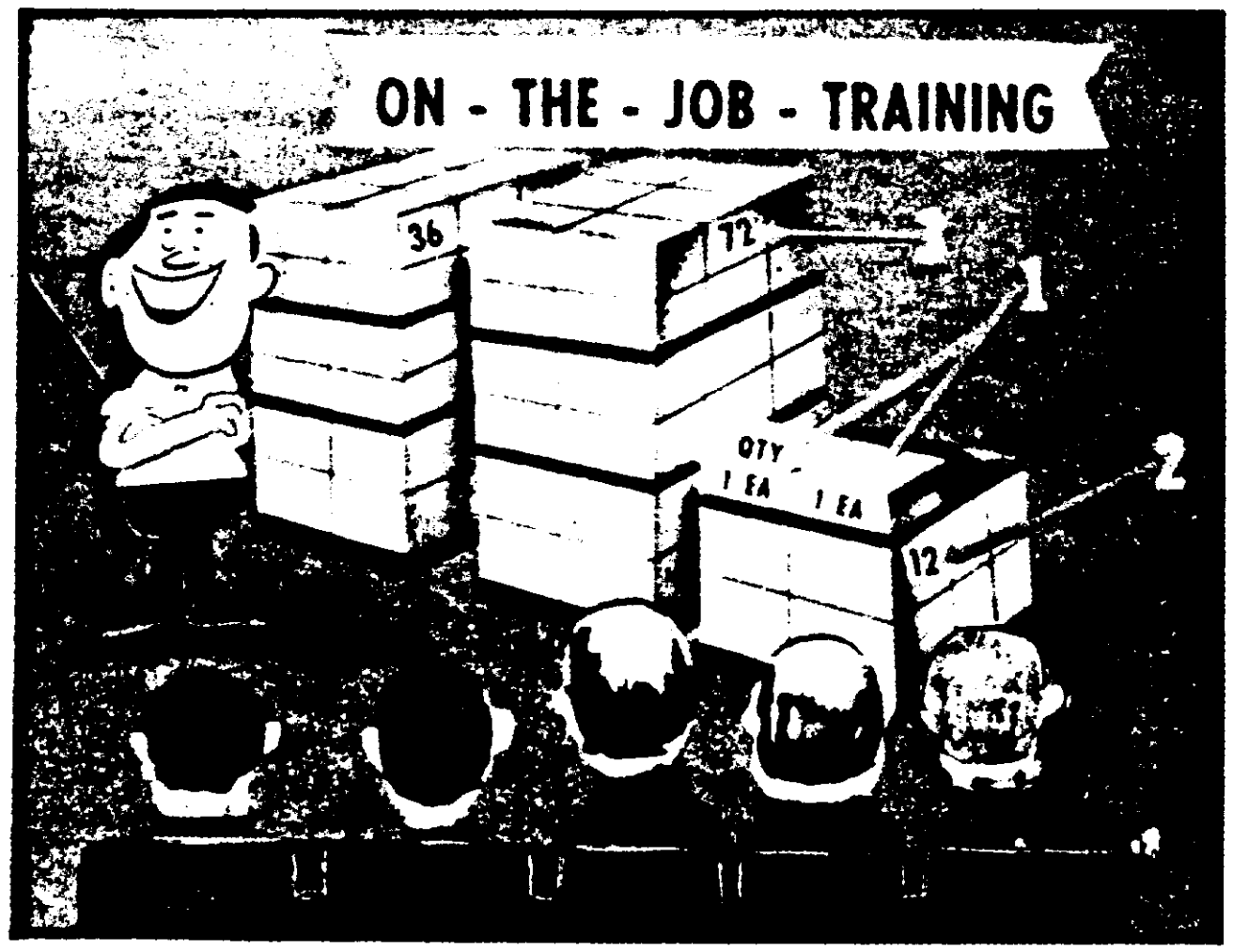
3-506. **Summary**

The following series of illustrations emphasize some key elements in properly accomplishing inventory actions.



a. Adequate training is a prerequisite of efficient inventory control operations.

(1) DOD educational centers offer many specialized courses of instruction in inventory control, statistical sampling, and quality control. Such courses of instruction will provide personnel with a high degree of skill.

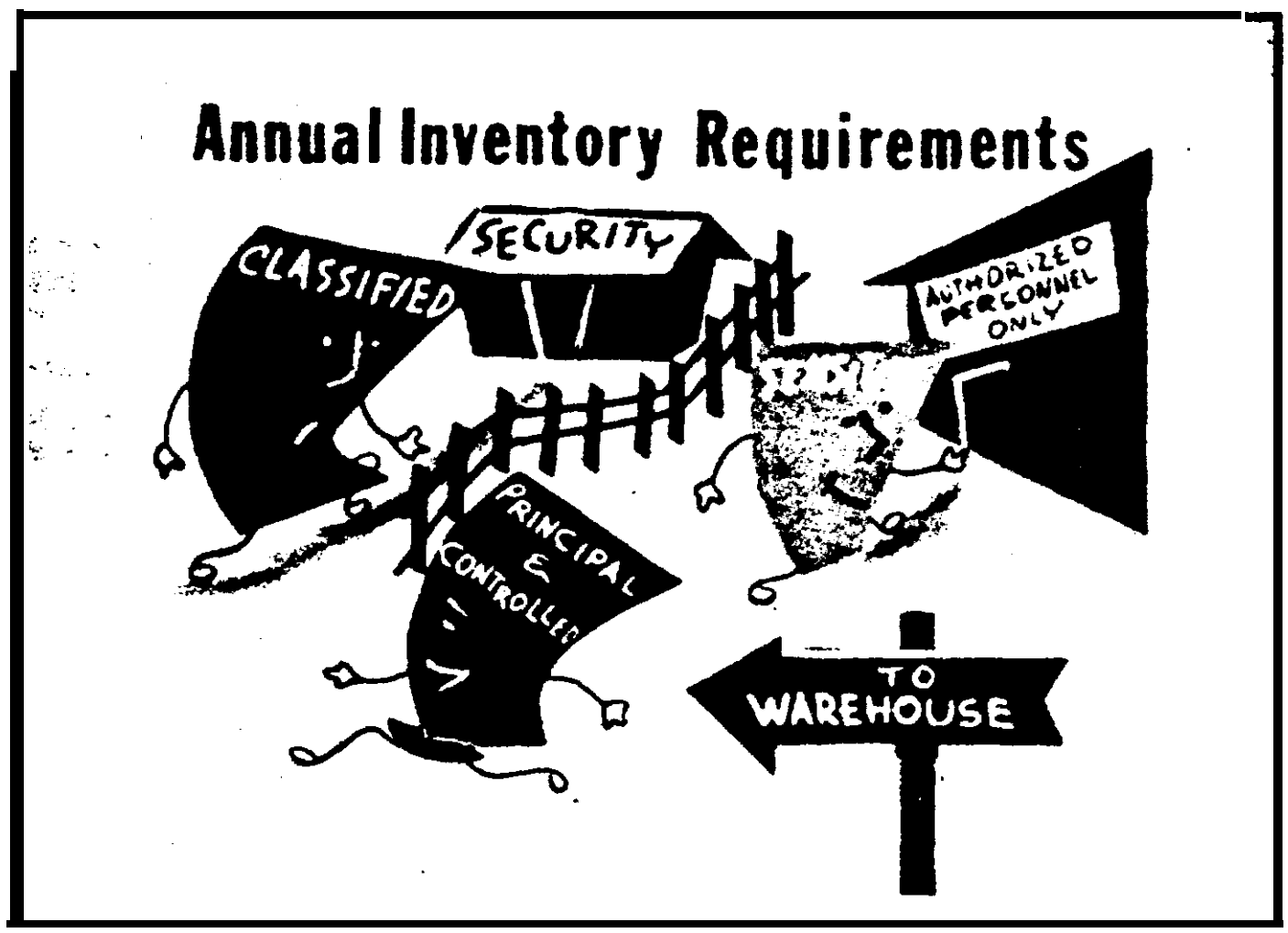


(2) In addition to formalized off-post training, each individual assigned to inventory activities should be given adequate on-the-job training to include the following

Preparation of documentation.
Identification of items.
Difficulties involved in counting at each type location.
Safety requirements.
Security considerations.

(3) These training suggestions, if effectively organized, should result in each individual being filly qualified for this particular assignment.

b. Each error that creeps into the record keeping system has a potential adverse effect on inventory actions. The ideal attack on this problem would be to eliminate the introduction of errors. But with thousands of transaction entries made each day, it is impossible to prevent error introduction in total. So we do the next best thing—we try to minimize error introduction and contain error growth. Quality control actions are designed to do this as are the location survey and location audit procedures.



c. Classified, principal, sensitive, and controlled items of supply will be considered separate lots. A complete inventory of these lots will be accomplished

once each year or more frequently if desired by the installation commander or accountable property officer. There are sound reasons for this.

(1) Classified items require special protection because of their security designation and, therefore, should be given special treatment to insure that each of these items is accounted for and our national interest is protected.

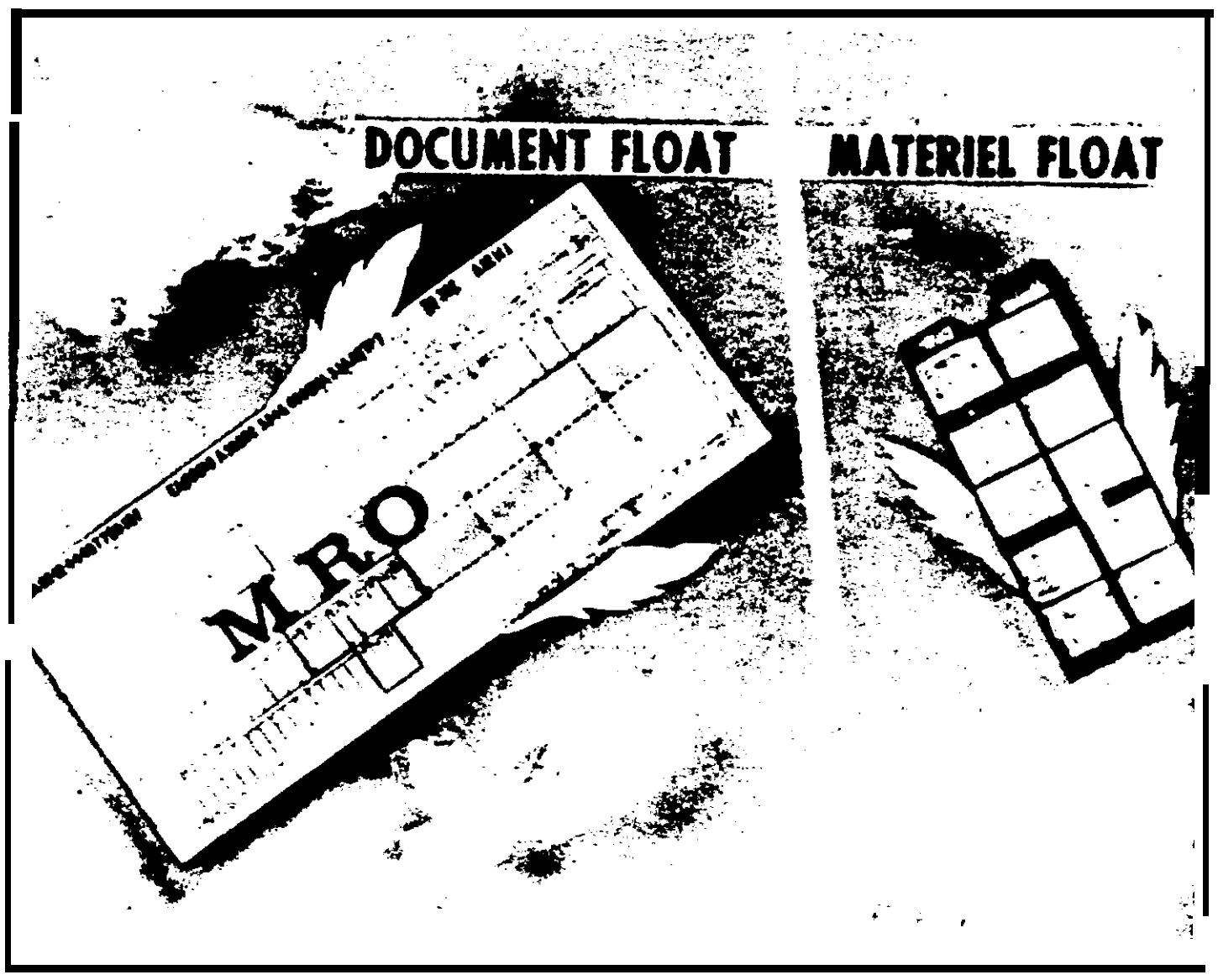
(2) Principal items are of strategic importance, high monetary value, unusual complexity of issue, and often involve procurement difficulties; therefore, these items should also be given special attention.

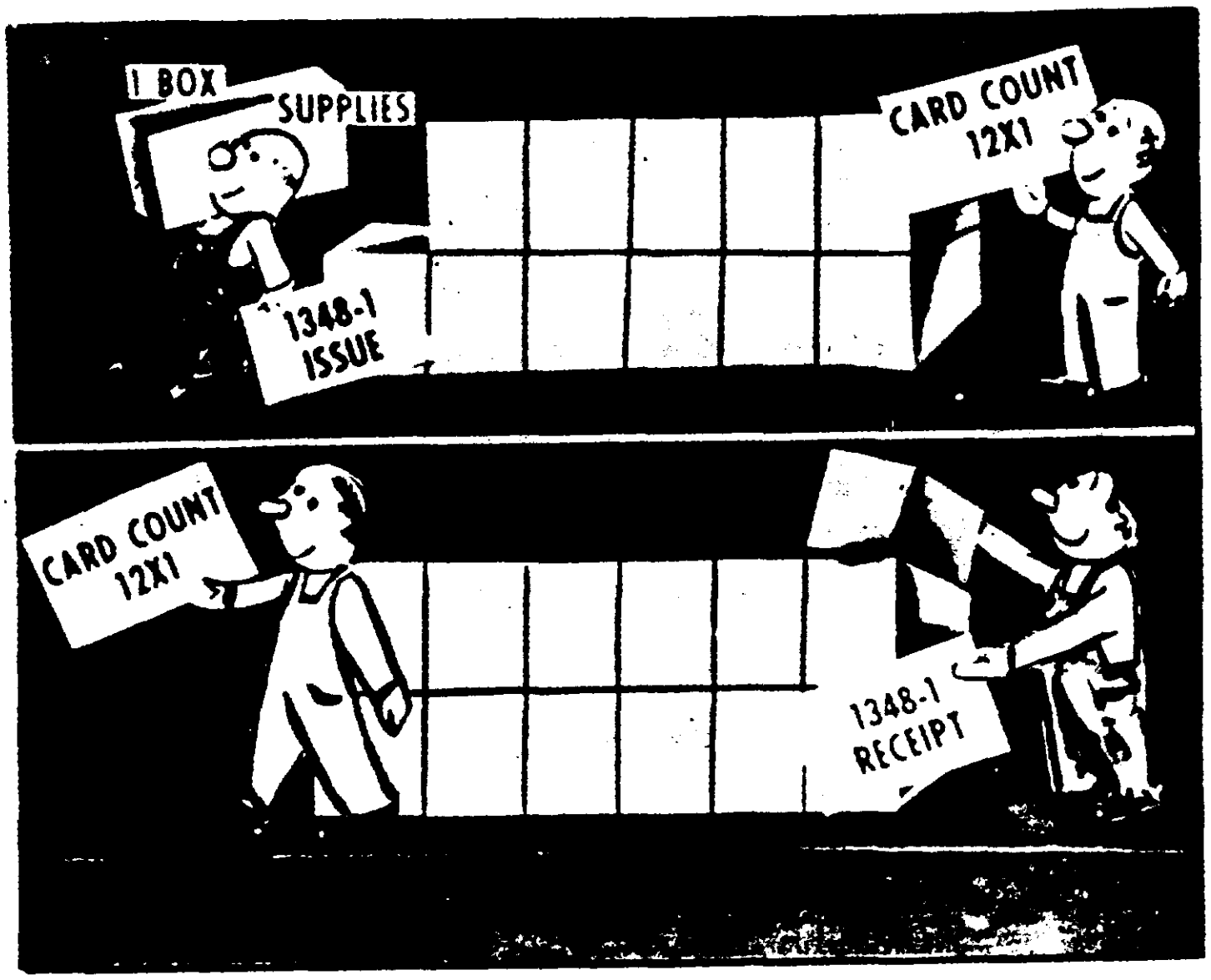
(3) Sensitive items have a ready sale in illicit markets and are especially likely to be pilfered. A periodic inventory of each of these items is essential for their protection and to discourage pilferage attempts.

(4) Controlled items of supply are closely supervised because of their basic cost, operational essentiality, complexity, or stock position and should also be given special attention.

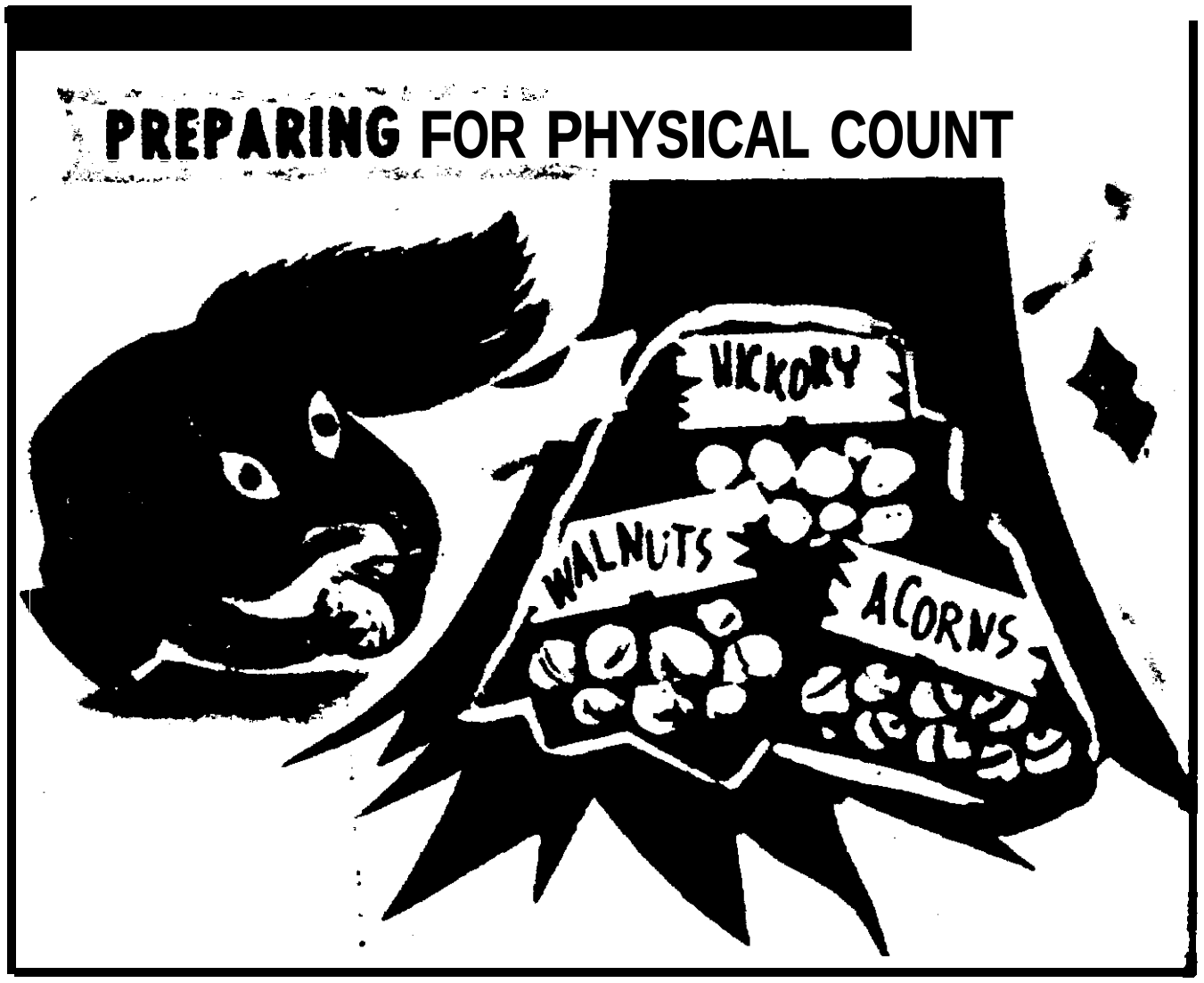
d. An important point to keep in mind when performing inventories and reconciliations is that inventories are normally conducted on an open "business as usual" concept.

(1) We can have both documentation and material "in-float." Both these situations must be considered when counts and recorded balances do not agree. The next two illustrations depict this point.

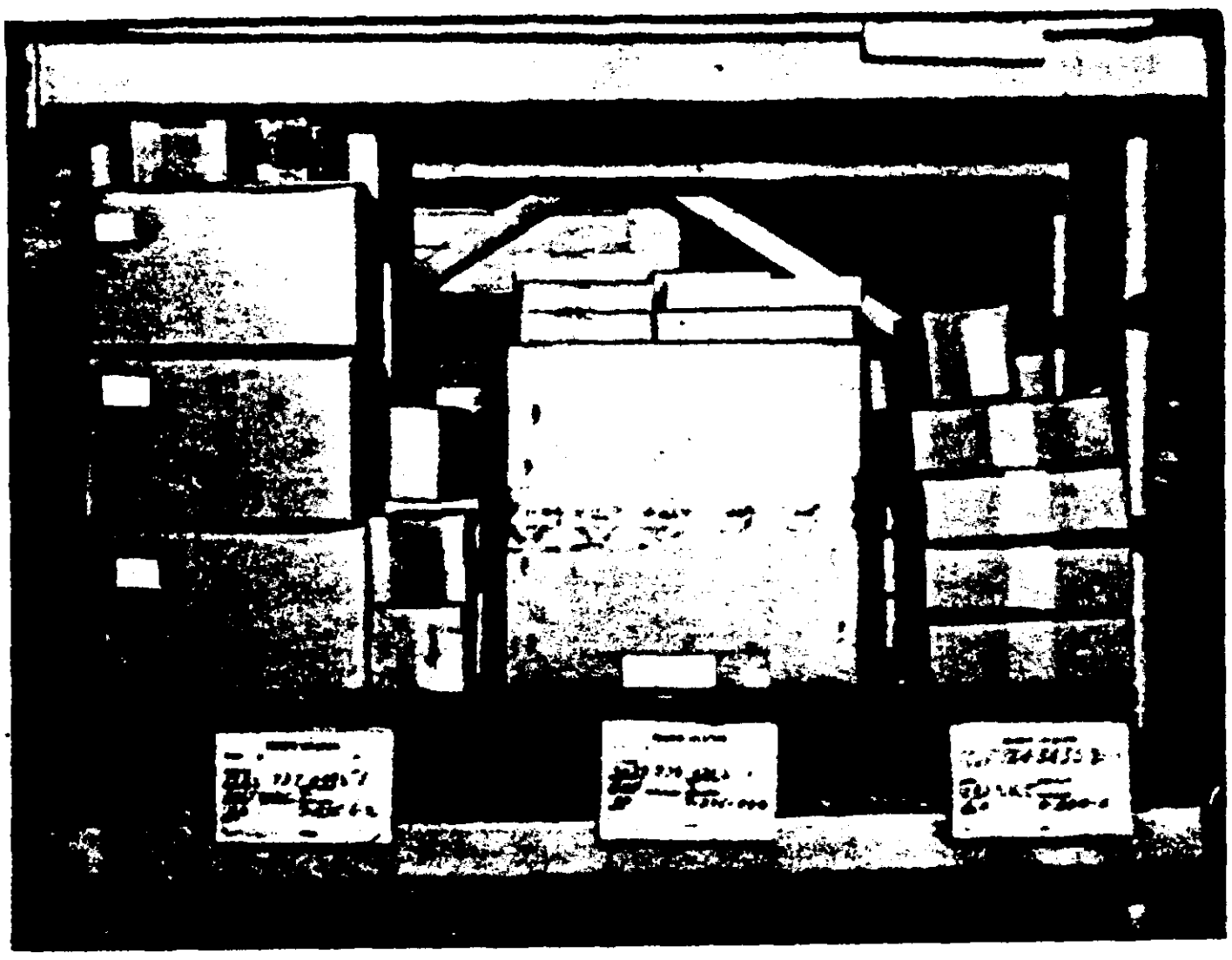




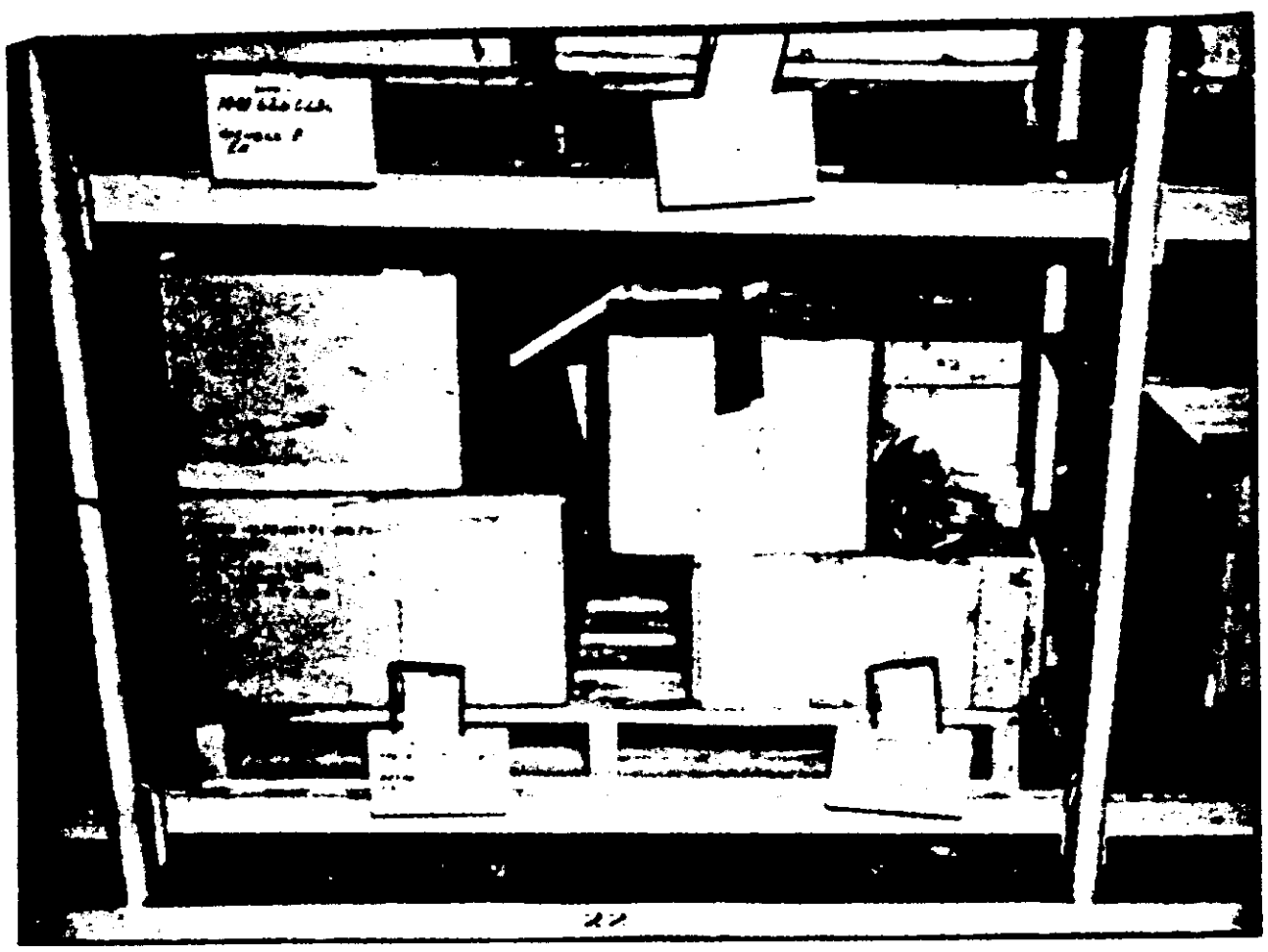
(2) We can see how, through normal receipt and issue transactions, counts may vary from balances and require recounting. Actions such as these are considered as float documents and should be reviewed carefully prior to submitting final inventory results.



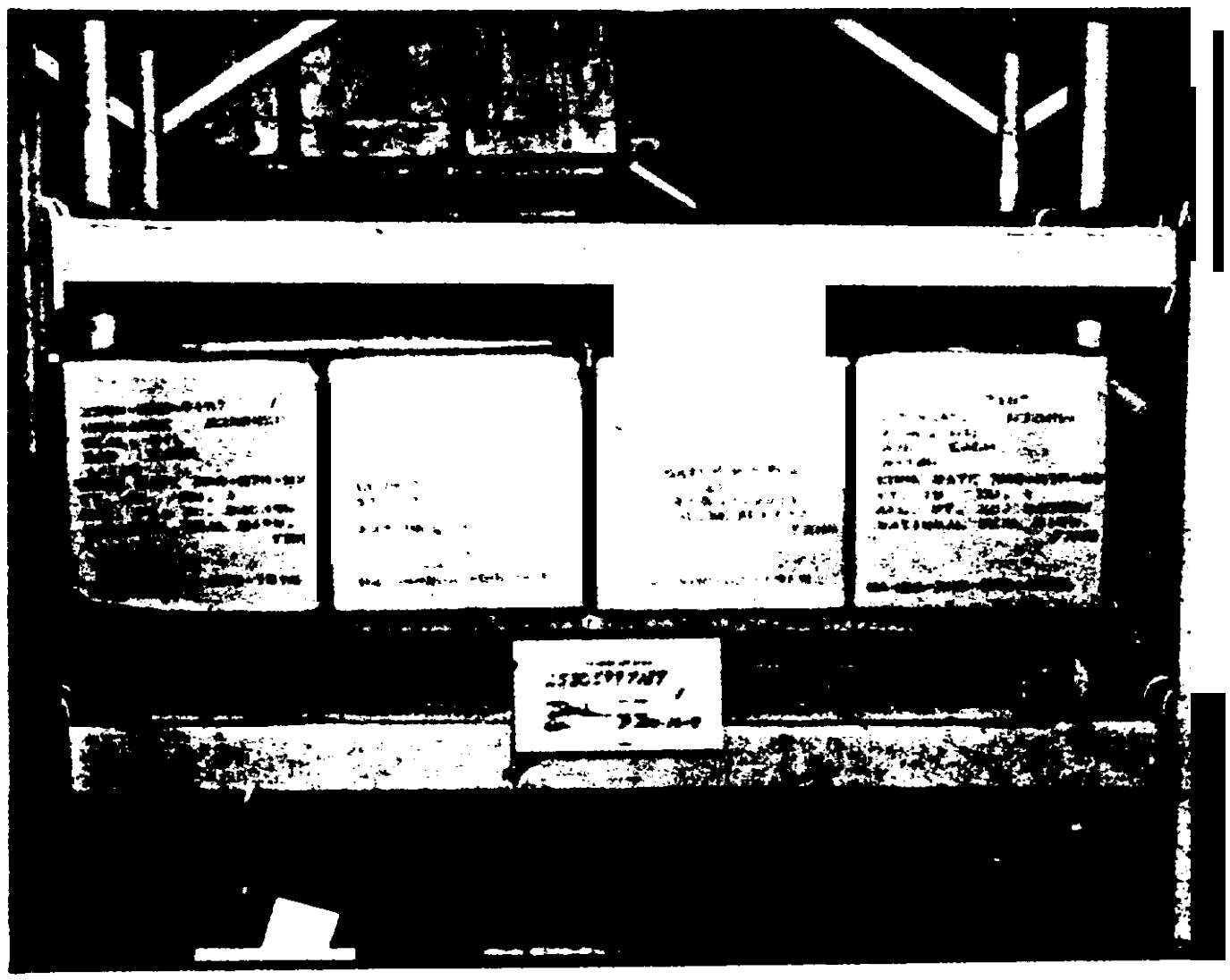
e. A survey conducted prior to an inventory, to determine and correct deficiencies, is an important phase of inventory preparation. During this period, every effort should be made to insure that conditions detrimental to the count are detected and eliminated. We know that normal warehouse activities tend to disrupt the orderly placement of stocks, identification placards, and containers on pallets, in pallet racks, or in bins. If left uncorrected, these and other warehousing irregularities could seriously deter satisfactory completion of the inventory. A **preliminary** survey which includes all facets of storage and warehousing methods that may interfere with inventory is a recommended pre-inventory action. Let us not compromise the quality of the inventory because we did not make adequate preparations. The next seven illustrations show some of the storage situations that may be observed in a pre-inventory survey.



(1) During a preliminary survey you may discover conditions such as pictured above. Here is a pallet rack containing material stored in such a manner that *many* handling actions would be *necessary* to determine quantities. When material is originally palletized, every effort should be made to place containers in such a manner that nomenclature and quantities can be easily seen.



(2) This is another example of material not ready for inventory. No markings on some of the containers and loose pieces in a rack location mean opening, counting, and repackaging most of the **stock;** thereby, increasing the chance for error. This is a condition which should be eliminated during the preliminary **survey.**



(3) Here material is carbonized and placed to facilitate convenient recording of quantities without removal of stocks from the rack. Original containers such

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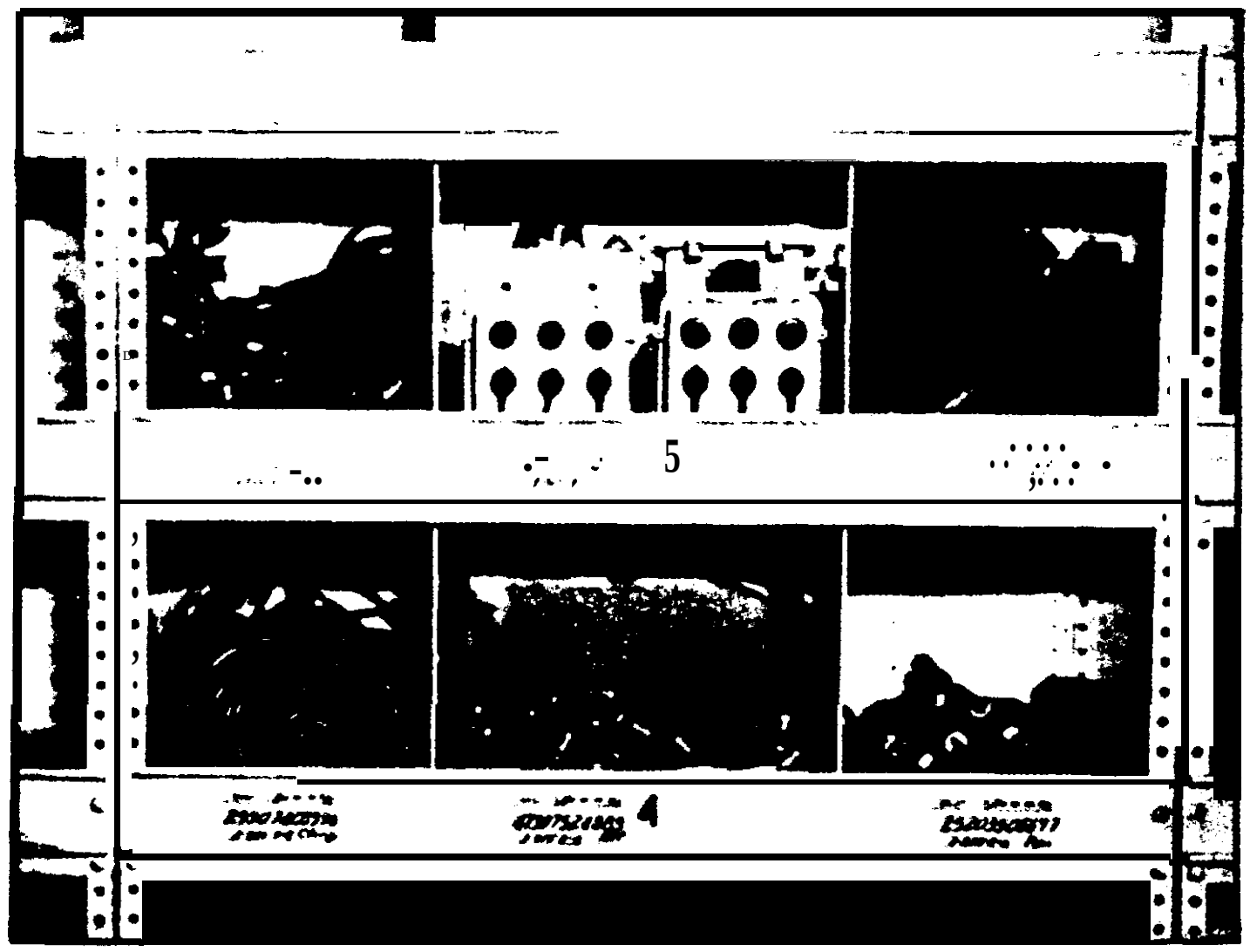
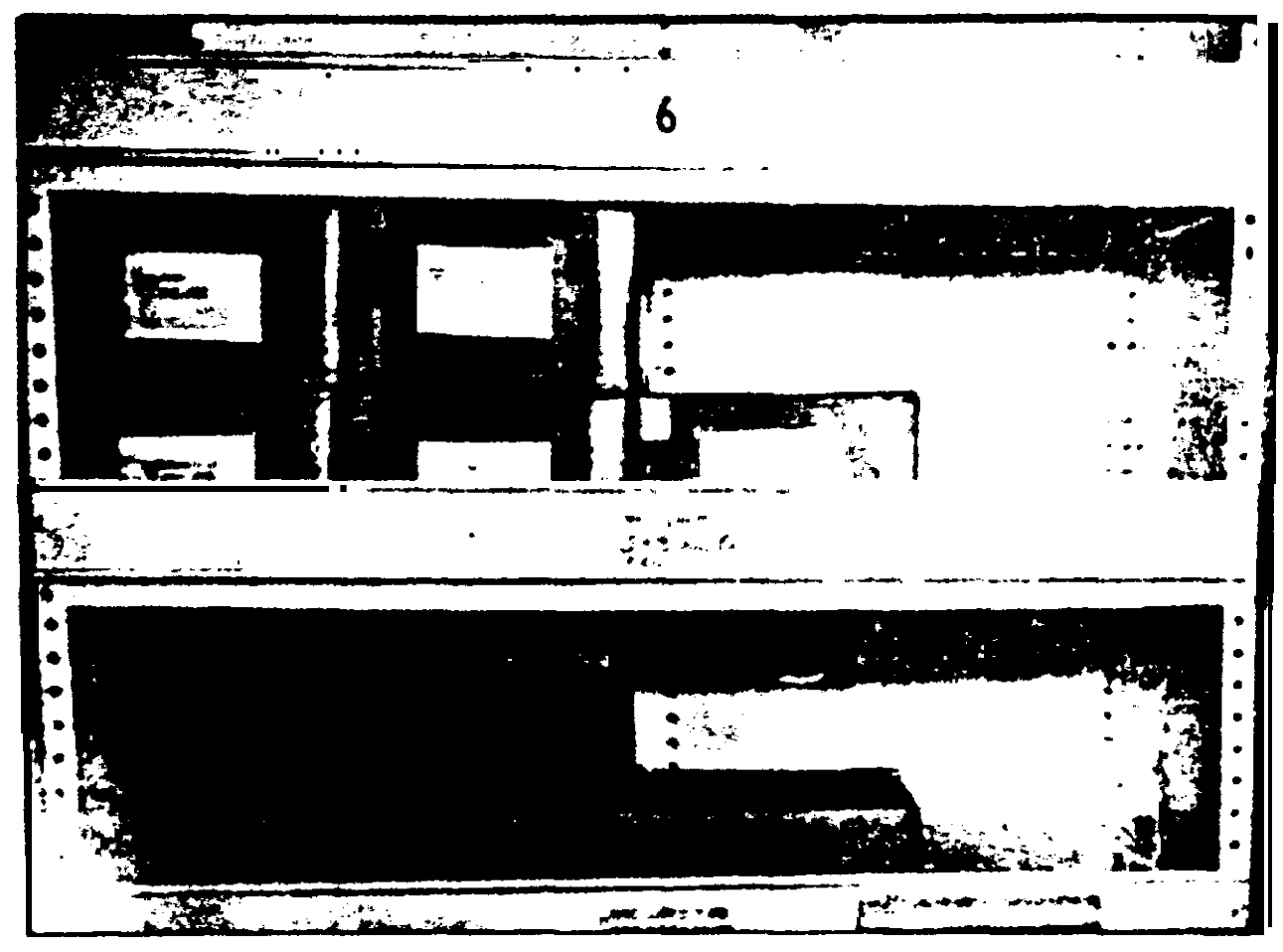
as these, or sealed and properly marked packages, need not be opened for inventory counting.

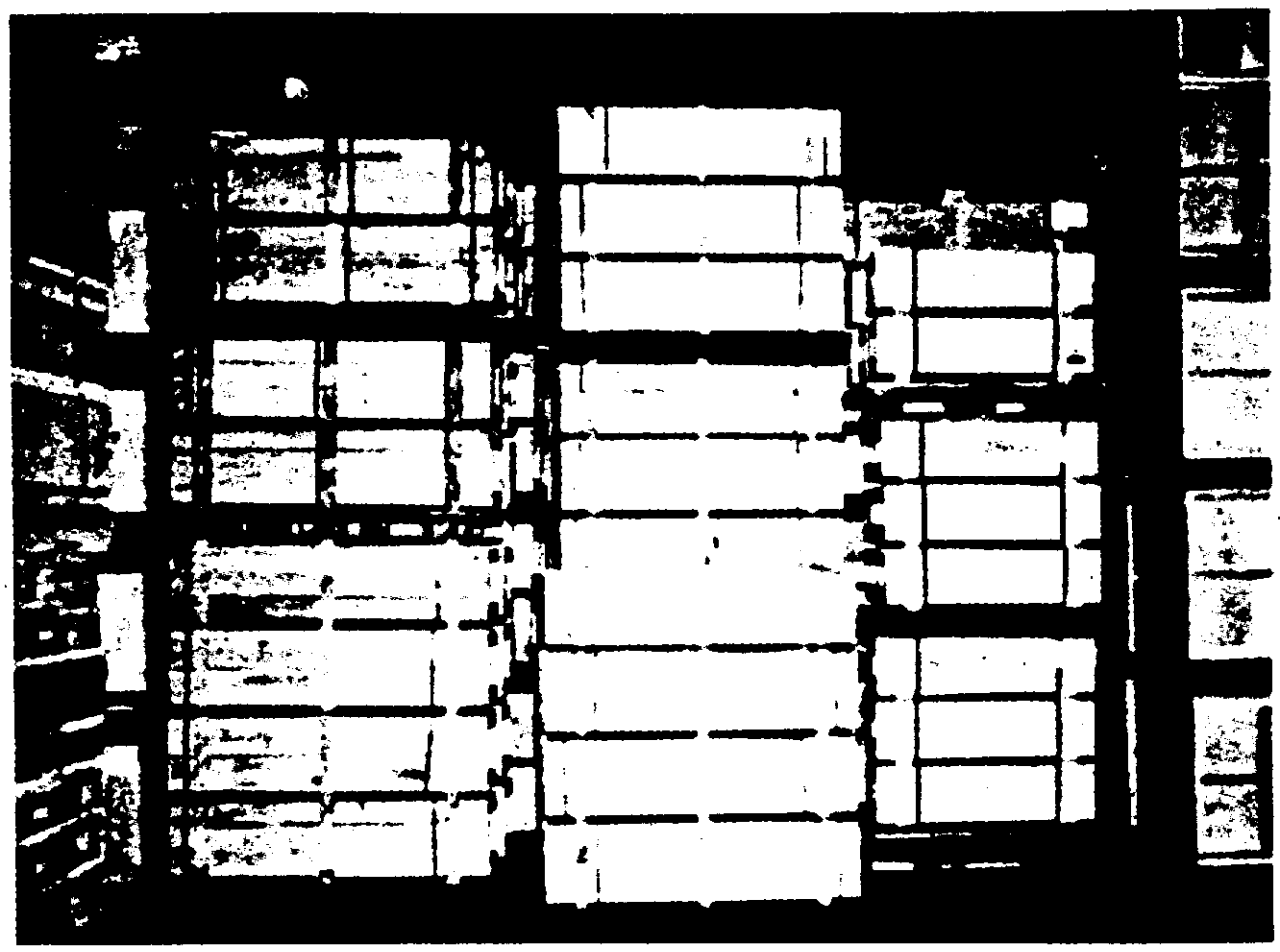


(4) These are loose bin stocks which are not properly prepared for inventory. Placement in unit. packs would accelerate the process of counting and help eliminate *counter errors.*

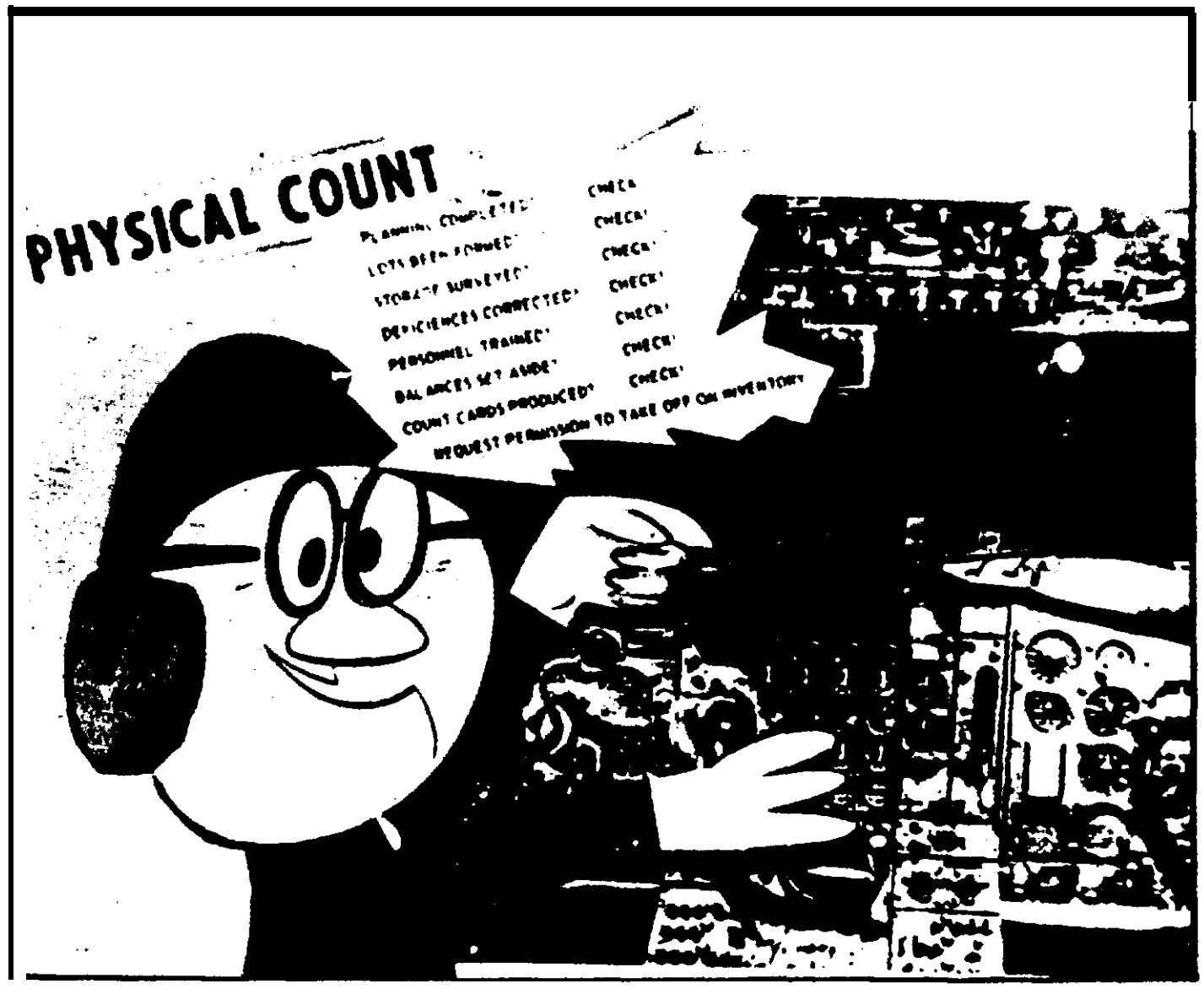


(5) Identification and quantities here are exposed in such a manner that counting will be a simple matter.

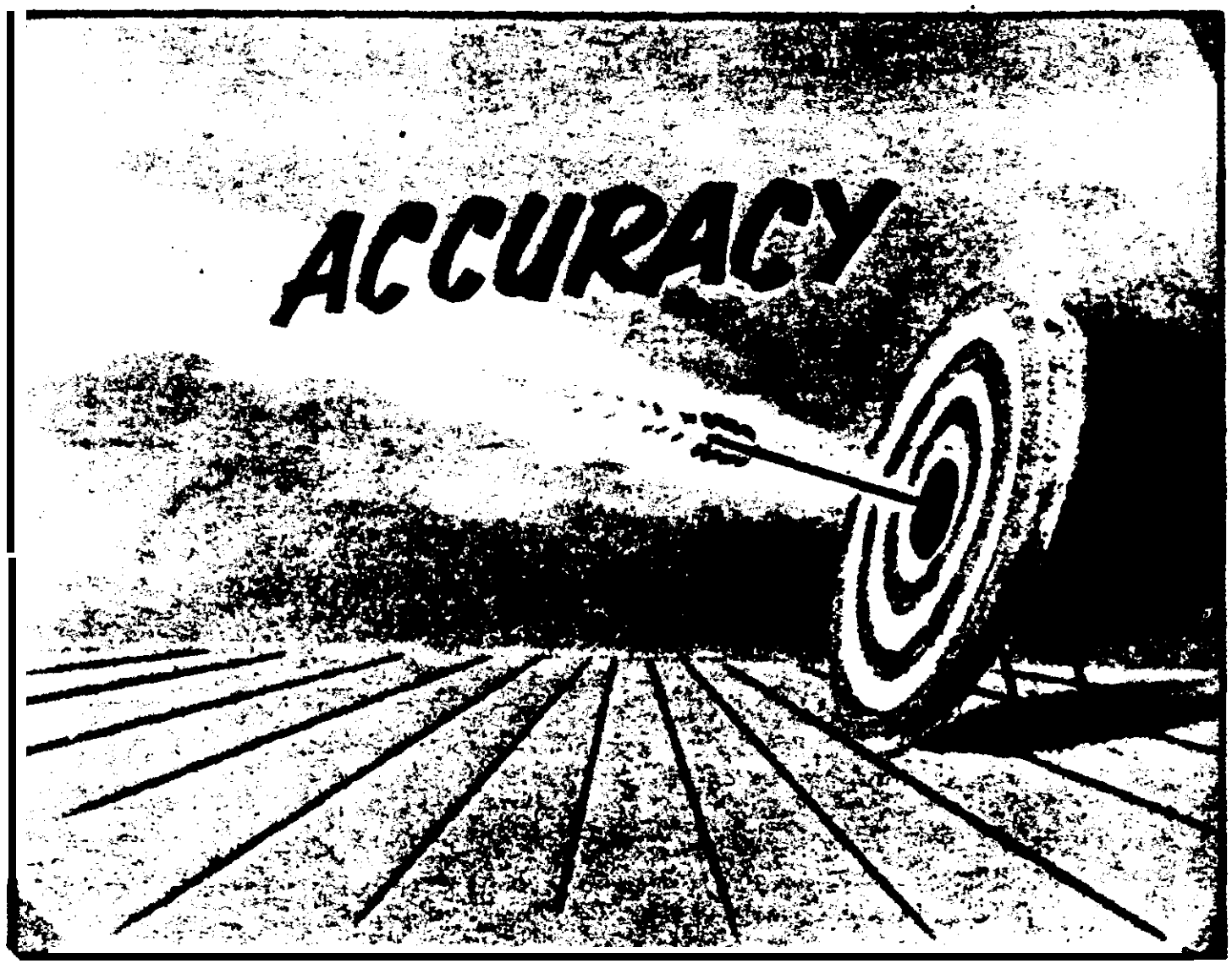
(6) Here is a situation which can cause counting errors. Note that this is a multi-item stack. A careless counter could inventory the whole stack as one item. Next, note the open box (not labeled as an open box) in the stack. Also, there are no markings visible on this box or on the one along side of it. Storing more than one stock number in a bulk storage stack should be avoided.



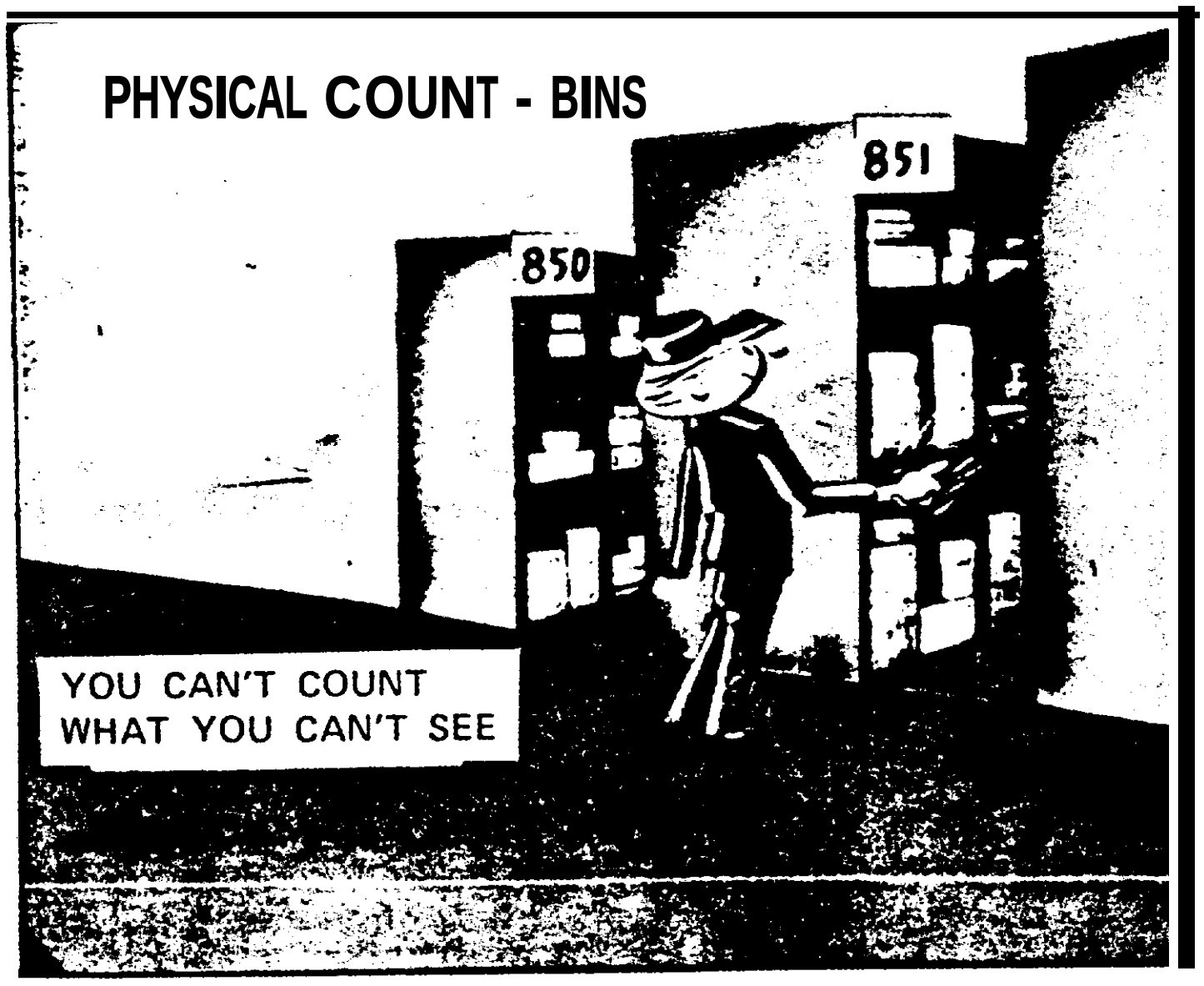
(7) This example of warehousing reveals a condition which, if not recognized, could cause an inventory error. All three *rows* in the photo are the same item, but the row on the right has a different size box. An inventory counter, if not alert for such a condition, might believe these boxes are another item and omit the quantity from the total stock in location.



f. Now that we have approached the starting point, let's take a final look at our **pre-inventory** checklist to assure that we take off in the right direction. When all points check affirmative, we can proceed with physical count and get the **inventory** off the ground,

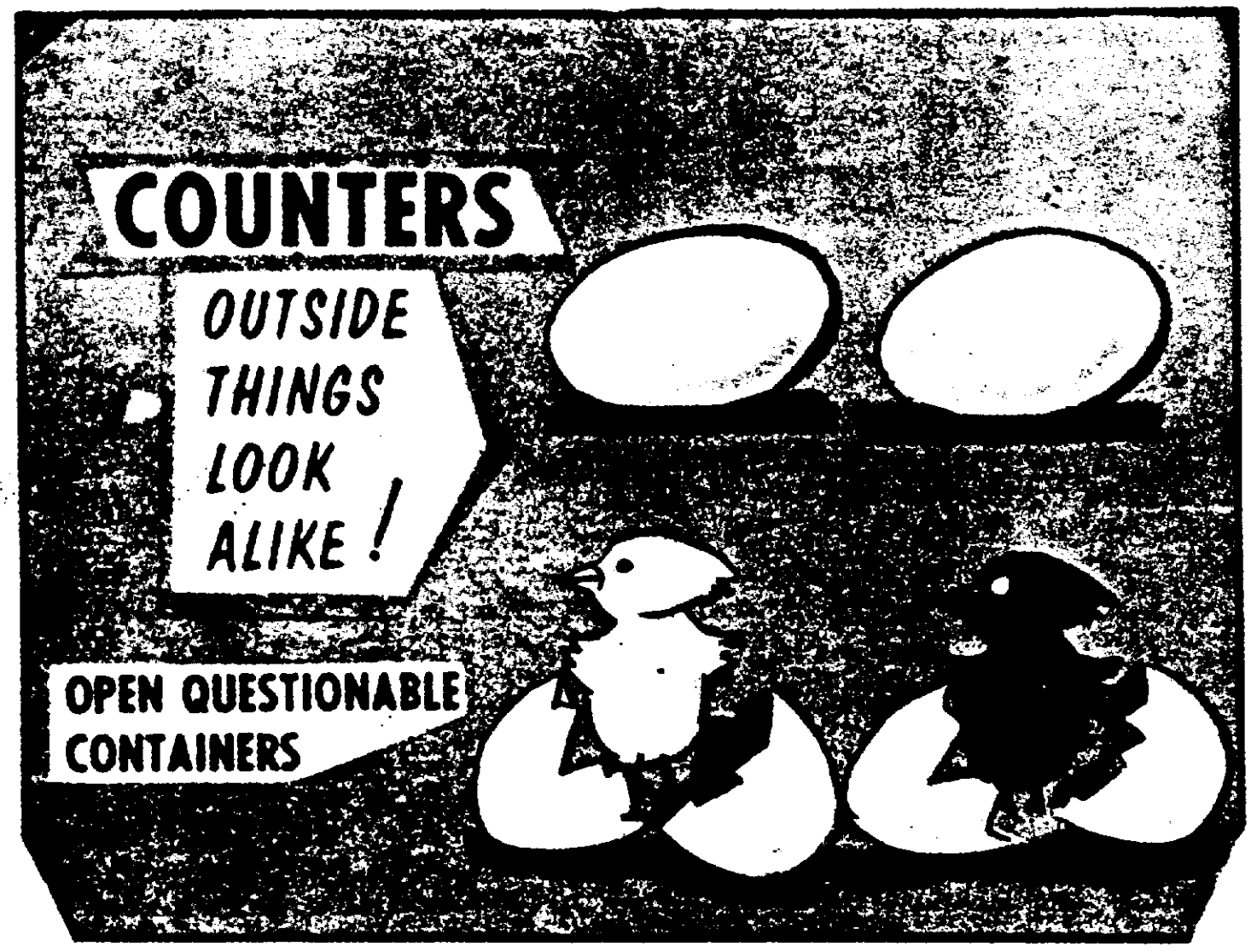


g. When starting your physical count, all actions should be aimed at **one target**—ACCURACY. To hit this **bull's-eye** means a successful inventory with a minimum of effort and costs.



h. In striving for accuracy, nothing can be left to chance. When conducting the physical count, be sure you know what you are counting—don't guess. You cannot count what you cannot see, so examine bulk and bin locations carefully. Make a note of discrepancies found and notify the appropriate office so that corrective action can be taken.

i. During the first count phase, the quantities indicated on containers and pallet and/or stack cards may be accepted provided an examination of the containers reveals no obvious errors. All irregularities (warehousing deficiencies) will be reported to the appropriate activity for correction.



j. As this picture illustrates, it doesn't pay to take too much for granted. Although original containers, or packages that have been packed and sealed locally, need not be opened for inventory, counters should be continuously alert for questionable containers. If there is a reason to believe that the quantity is inaccurate, or the identification doubtful, the container should be opened, verified, and count recorded accordingly.

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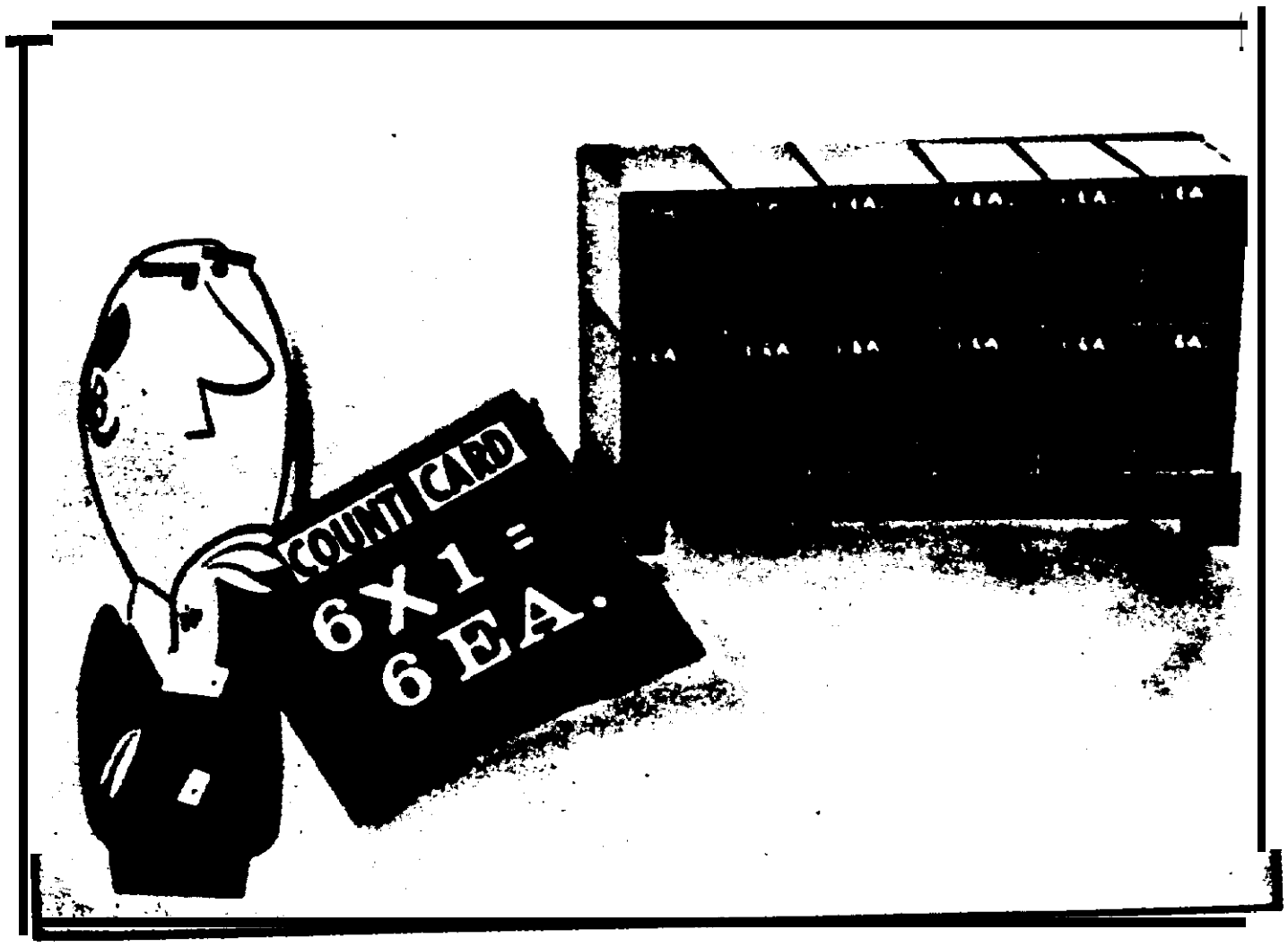
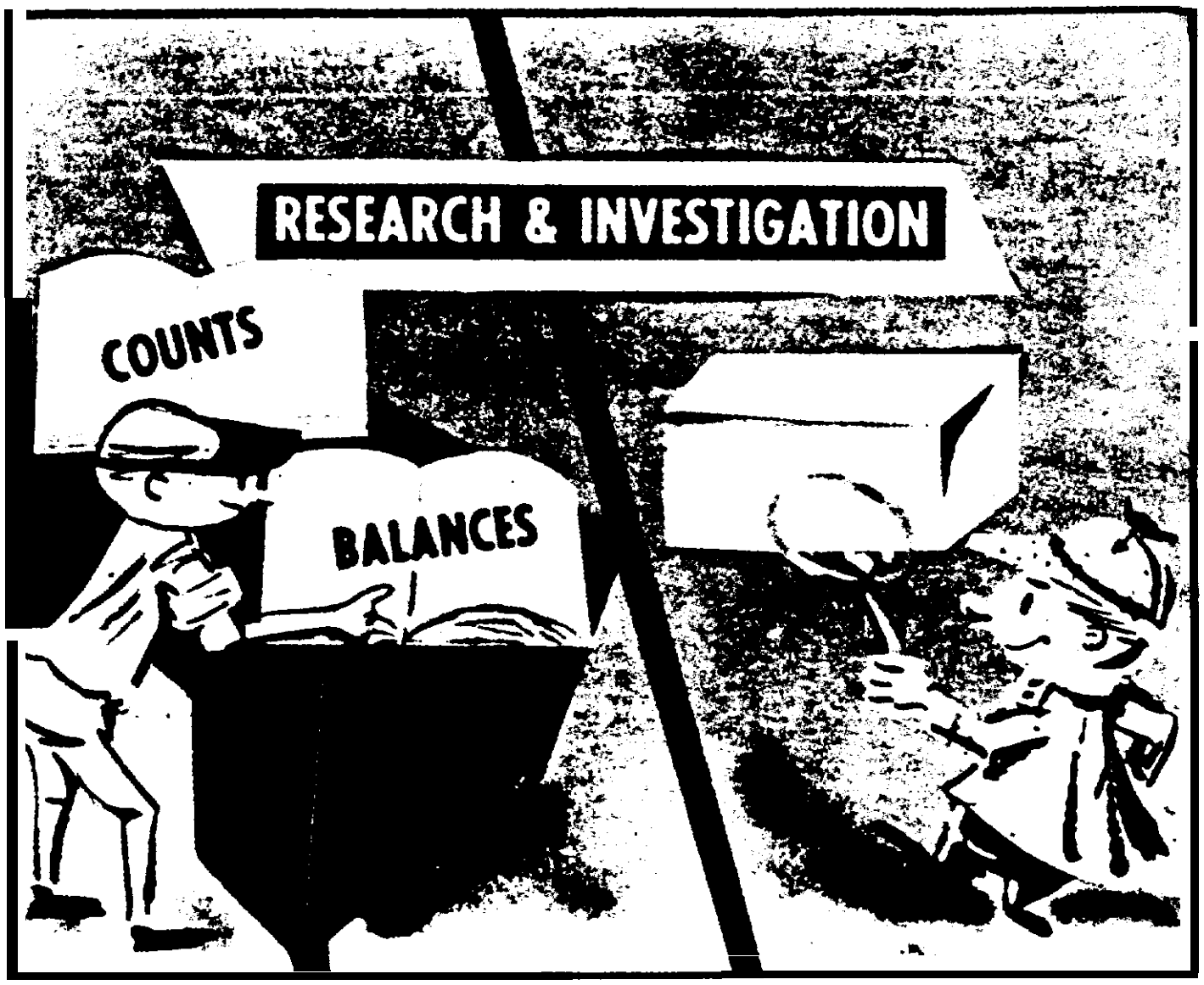


k. Incorrect counting is the prime example of how erroneous adjustments and secondary counts are generated. After you have recorded your count, give it a second look to assure that what you are going to report is correct.



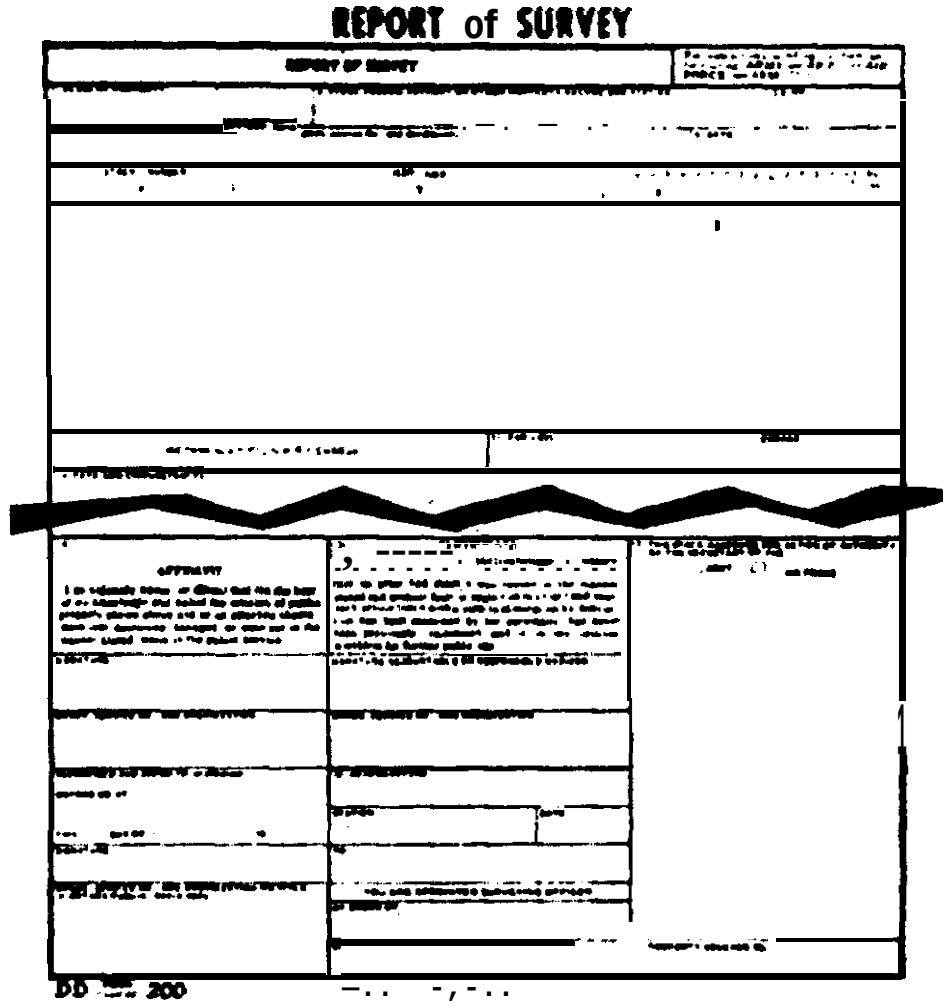
l. An important part of every inventory is "the research and investigation conducted on discrepant items prior to and after the stock records are adjusted.

(1) Research and investigation is the responsibility of the inventory and stock accounting activities. Inadequate research actions will result in unwarranted adjustments and increases the number of complete inventones. A review of items prior to updating stock records, could eliminate an inventory adjustment.

(2) Research documents prepared during inventory phase to determine if material was in float, or if change had occurred which affected the quantity identified or condition of the item. After adjustments have been processed to the stock records, a complete and thorough investigation will be made on items designated by the accountable property officer. Research lists prepared from the adjustment routine must be screened and transaction activity histones prepared on each major discrepancy. Review histories for receipt, issue, and adjustment documents prepared during inventory, which may have been in float at the time count was conducted. Determine whether there are posting errors or adjustments of offsetting quantities since the last inventory that would explain the discrepancy and preclude report of survey actions.

m. When an approving authority is examining inventory adjustment reports prior to approval, he/she may decide through personal judgement and experience that an item shortage may be due to loss through pilferage, theft, or other unauthorized means. When this happens, and the storage cannot be explained by offsetting adjustments, erroneous posting, or improper shipments, he/she will direct preparation of a report of survey. The Report of Survey (DD Form 200), will be prepared by the responsible officer and processed in accordance with applicable Service Agency regulations.

REPORT of SURVEY



Section 6. CARE OF SUPPLIES IN STORAGE

3-601. General

The care of supplies to assure a ready for issue condition is an important task. The DOD Components prepare and publish detailed instructions to provide for the care of items for which they have storage responsibility. Such publications will agree with the policies of this regulation. The use of quality control techniques and storage serviceability standards will enable a Care of Supplies in Storage (COSIS) pro-to be accomplished at minimum cost with optimum efficiency. Quality control and deterioration data will be generated to be used for improving standards of serviceability, specifications, and procurement quality standards.

3–602. Policy

a. A program for COSIS must include-a quality control system for inspection and or test; a system for reporting and recording of quality control data; provisions for the entry of true condition code of material into item balance records; performance of exercising actions on applicable *material;* and *a sys*tem to assure corrective actions are accomplished on material deficiencies uncovered by inspections. DOD Components will determine the degree of activity required in each phase of the program and establish procedures. Major factors affecting the degree of activity are the type of item, type of storage provided, and anticipated length of storage.

b. For material not covered by storage serviceability standards or other adequate inspection procedures, frequency of material inspection (excluding shelf-life items) will be based on the type storage provided for the material (table 3–1). Frequency of inspection for shelf-life items will be based on expiration dates.

c. Adequate protection from the elements and environmental conditions will be provided by means of proper storage facilities, preservation, packing, or a combination of any or all of these measures.

d. The results of quality data generated from analysis of inspection of items during shipping, set assembly, special inspections directed by the item *manager, customer complaints,* and other quality feedback information will be used to supplement

the regular cyclic inspection results to evaluate the adequacy of the COSIS program.

Table 3-1. Inspection frequencies for material not covered by storage serviceability standards.

Type of storage	*Frequency (months)*
Controlled humidity (or equivalent rating when such rating has been approved by higher authority)	60
Controlled temperature warehouse	30
Noncontrolled temperature warehouse	24
Shed/transitory shelter.	12
Open	6

3–603. Objectives

The objectives of a COSIS program are to—

a. Maintain material readiness posture in CONUS and oversea commands at an optimum level.

b. Assure that the true condition of material is known and recorded through cyclic inspections and tests.

c. Provide a basis for realistic workload forecasts to determine and substantiate budget and manpower requirements.

d. Assure that only material representing current or anticipated supply system requirements is scheduled for preservation/represervation and packing to preclude expenditure of *resources* on excess *or ob*solete material.

e. Permit adjustments in storage inspection frequencies and quality control efforts to provide greater efficiency and economy through analysis of data concerning variation in deterioration rates.

3-604. Responsibilities

a. The care of supplies is an integral part of the storage and quality control responsibilities. To discharge these responsibilities properly and with a minimum of cost, a carefully developed program is necessary at all echelons.

b. Where the stocks of one DOD Component are stored in a facility of another DOD Component, the Component operating the facility is responsible for accomplishing the care of supplies in the manner established by the owning Service or Agency or in accordance with existing cross-service agreements.

3-605. **Basic COSIS Program Actions**

a. Performance of scheduled inspection actions on material in storage.

b. Performance of required exercising actions.

c. Proper identification of items.

d. Determination of adequacy of storage environment, preservation, packing, and marking.

e. Accurate determination of item condition and posting of this condition to record,

f. Arresting all forms of deterioration that will adversely affect the end use of required items.

g. Restoration of required items to a serviceable condition for issue.

h. Detection of fungi, mildew, spoilage, insect infestation, and/or rodent, or other pest damage to stocks; prescribe or administer treatment; and ensure that adequate preventive and corrective measures are taken. (See sec. 4, this chap.)

i. Inspection of shelf-life items and assignment of condition codes thereto in accordance with DODI 4140.27, Identification, Control, and Utilization of Shelf-Life Items.

Note: The term shelf life does not apply to Class V items.

j. Assuring that all applicable elements are informed of any unsatisfactory conditions found to exist in stocks; the reasons therefore; corrective actions required and taken, any pertinent data which can be used to improve the item and its care; and the packaging and/or storage environment considered to be best suited for its continued storage.

k. Recommending to the applicable DOD Component, basic changes in serviceability standards or adaptations to local conditions, such as storage environment or availability y of specialized testing capacit y not normally found in storage installations. For example, quality analysis may indicate the need for adjusting the frequency of inspection, or changing the preservation procedures, or for revision of Acceptable Quality Levels (AQL) or defect classifications.

3-606. Guidelines for Systematic Inspection of Material in Storage

a. Cyclic inspection. Inspection of material in storage is an extremely important step in the evaluation of material quality. Its purpose and objectives are directly related to a COSIS program. In many instances, long periods of time elapse from the time of receipt of material by the storage activity until ultimate issue/shipment to the user. During this interim period stored material must be systematically inspected to detect condition, degradation, deterioration, corrosion, damage and other deficiencies caused by improper storage methods, extended periods of storage, or by the inherent deterioration characteristics of the mate-

rial. Minor deficiencies must be detected before they become of major significance, thus providing for corrective actions before the material becomes unserviceable or unusable. In this regard, a program of cyclic inspection identifies those stocks which require corrective preservation and packing to assure that material is maintained in a serviceable condition and identifies those assets which require condition reclassification to a lesser degree of serviceability.

b. Effective and efficient execution of the Cyclic Inspection system requirements will assure that-

(l)"Stored material is inspected at intervals indicated by the assigned shelf-life code, inspection frequency code, or type of storage afforded the material.

(2) Quantitative data generated by the cyclic inspection system are thoroughly analyzed, summarized, and furnished periodically to management to assist in the elimination of causes for deficiencies.

3-807. Special Considerations in Care of Stored Material

a. *Material in open storage. Ideally,* all material should be stored in covered storage space. However, since covered space is usually at a *premium,* there are occasions when material must be placed in open storage areas. These items must be preserved properly to withstand the exposure to elements. Additional protection can be gained by use of plastics, tarpaulins or portable shelters over material. Figures 3-17 and 3-18 are a few examples.

(1) Care must be exercised in the covering of materials placed in open storage. The relatively quick temperature changes, to which such materials are subjected, cause moisture to condense on the material, and, unless this moisture is evaporated and carried away by adequate ventilation, will cause the stores to mold or decay. In the case of most metal products moisture condensation will

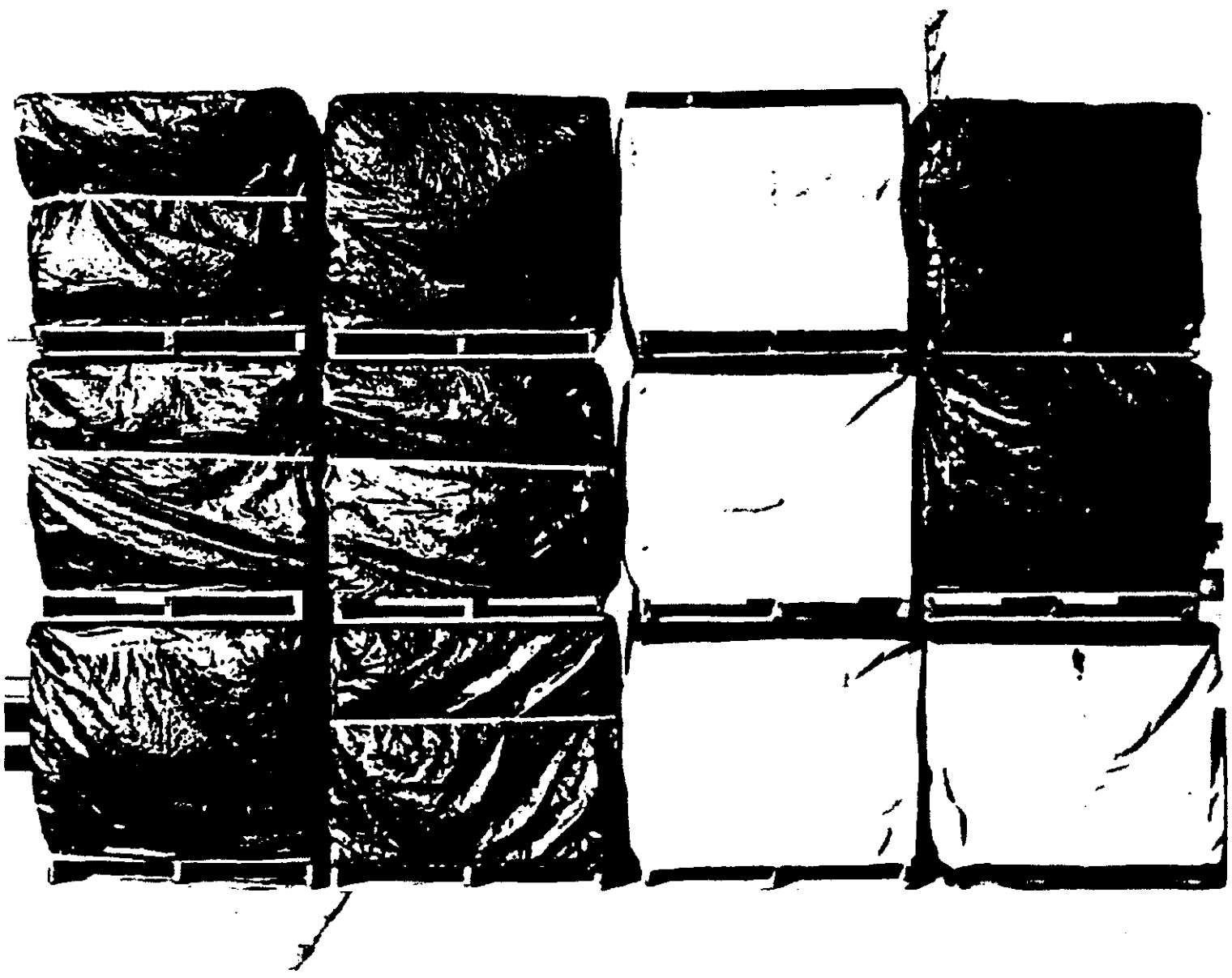


Figure .!3-16. Individually protected pallet loads.

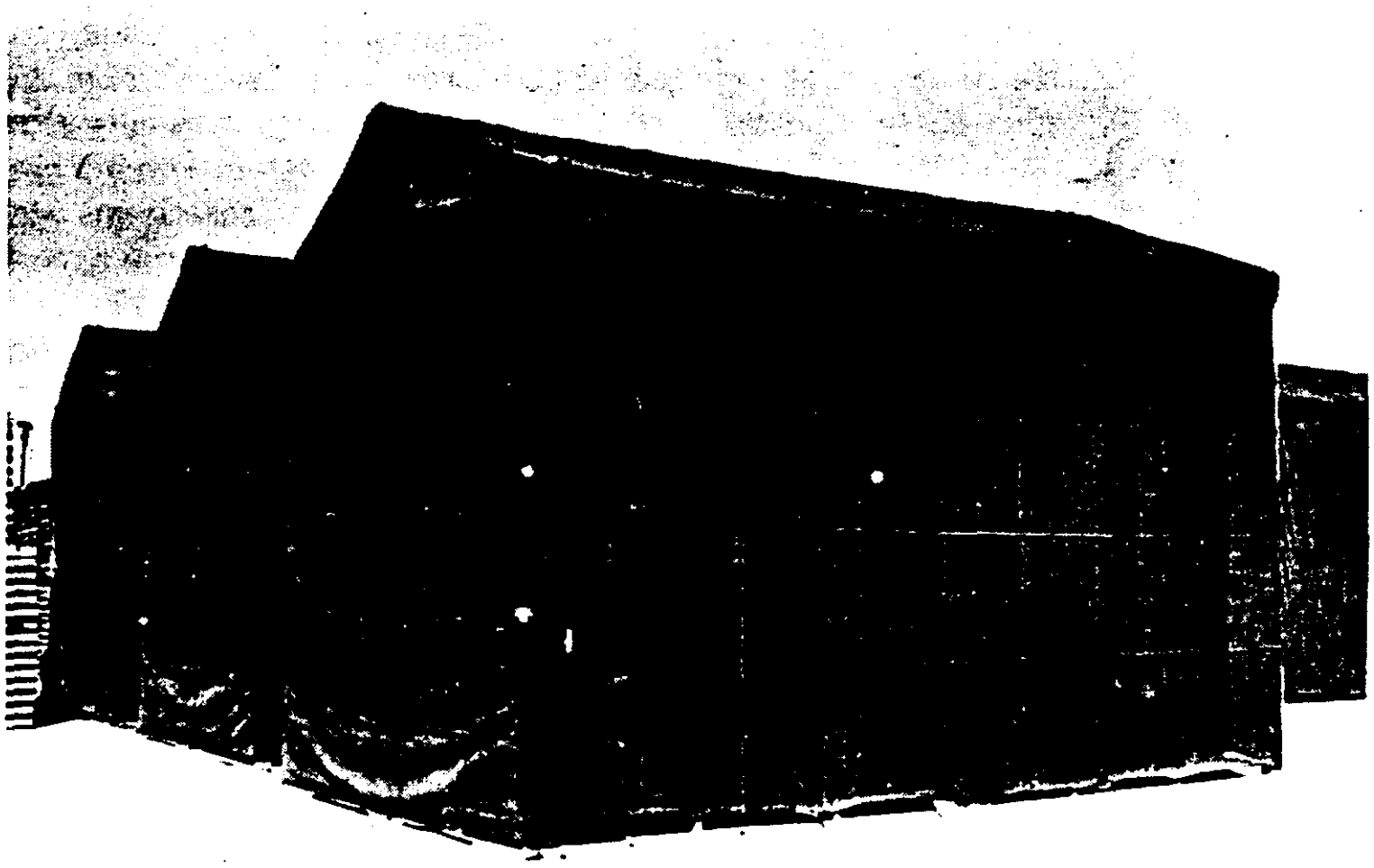


Figure S–1 7. Tarpaulin type shed arrangement.

cause excessive rust, resulting in a high rate of deterioration for the stored item.

(2) When covering materials with tarpaulins or other such materials a clearance of 12 to 18 inches should be maintained between the bottom of the covering and the ground, where possible. In the covering of machinery or other materials which are not boxed, the tarpaulin should extend to, but never below, the top of the dunnage on which the material is being stored. To further induce air circulation in and around the stored material an opening should be provided in the upper area of the stack covering it should be arranged, however, so that rain or snow cannot enter the stack.

(3) All material stored outdoors should be elevated above the ground by use of dunnage or specially built platforms or foundations (see chap. V, sec. 3, para. 5–305*b*(6) for exception for wheeled and tracked vehicles). The type of storage area will determine to a great extent the type of dunnage required to provide adequate ventilation beneath the stack. On well-drained paved or black top areas, the dunnage used should provide a minimum clearance of 4 inches between the stores and the ground. On well-drained gravel or similarly surfaced areas the dunnage should be increased to provide a minimum clearance of 8 inches. Where it is necessary to utilize ungraded or poorly drained areas for storage, the dunnage used should provide a minimum clearance of 10 inches above the highest possible water level. Such clearances do not pertain to the storage of lumber in open areas. (For detailed information on lumber storage, see chap. V, sec. 1).

(a) It is impossible to specify the dunnage bearing surface required for all storage conditions. On good concrete surfaces 4 by 4-inch dunnage spaced on 2-foot centers would be sufficient to sup port a stack of comparatively heavy equipment. However, if this same stack of equipment were to be stored on an ungraded or comparatively soft storage area, the bearing surface of the dunnage on the ground would have to be increased in proportion to the decrease in the supporting quality of the storage area. Therefore, the storekeeper must con-

sider both the weight of the proposed stack and the supporting quality of the surface of the storage area in determining the type and quantity of dunnage required for each stack.

(*b*) Under certain conditions, concrete blocks may be substituted for, or used in conjunction with, wood dunnage. Warranting circumstances could include—moist or humid areas where damp rot or termite infestation may occur; dry or torrid areas where dry rot or wood beetle infestation may occur; planned long term storage programs; or the lack of salvage dunnage, necessitating the use of new materials, in which case the cost factor would be considered.

(4) Materials stored in the open require closer attention than those stored in warehouses or sheds. Such material must be inspected for indications of preservation failure, such as paint blisters due to rust beneath the paint, flaking or peeling of paint, or deterioration of other applied preservative. Usually, this is indicated by small areas of rust or corrosion on the preserved item. Additionally, after hard rains, heavy snows, windstorms, and abrupt changes in the weather, stocks must be inspected for torn or displaced coverings, accumulations of water or snow, or other conditions that may adversely affect the material, and for damage to corrosion preventives which have been applied. More frequent *inspection* is *required when the atmos*phere contains industrial waste, dust, salt, or acids; when the relative humidity is high; or when the material is subjected to wide variance in temperature.

b. Shelf-life items. Items which possess deteriorative or unstable characteristics to the degree that a storage time period must be assigned to assure that they will perform satisfactorily when issued. There are two types of these shelf-life items. Type I shelf-life items have a definite (nonextendable) storage *time period terminated* by an *expiration* date which was established by empirical and technical test data. Type 11 shelf-life items have an assigned storage time period which may be extended after the completion of prescribed inspection and/or restorative action..

(1) Storage personnel are responsible for executing the control program as directed by the inventory manager. Effective shelf-life control at the warehouse level requires vigilance on the part of all personnel, careful supervision, and understanding of the intent of the controlling procedures. Shelf-life items will be identified on storage records by the assigned shelf-life codes. Warehousing practices should permit ready access to oldest stocks and controls will be established to ascertain that the releasing authority's directives, as to which stock to issue, are followed. Stocks and records will also reflect appropriate condition codes. Normally, shelf-life items will be issued on a First-In, First-Out (FIFO) basis although exceptions to this policy may be necessary when circumstances require.

(2) Stocks other than shelf-life items should also be rotated by use of FIFO principle wherever practicable.

c. Exercising. Storage serviceability standards may require exercising of certain equipment (e.g., weapon recoil mechanisms, certain vehicles, certain aircraft components). These exercising actions must be done when required.

d. Special material condition marking. Material condition tags/labels (MIL-STD-129) will be used to identify material when material may possibly become mixed during maintenance, storage, or ship ment within (or between) installations, or when physical evidence of inspection is necessary for material control to prevent duplicate inspections. These forms/labels are not for indiscriminate use on material that presents no problem in storage or transfer. The five material condition tags and five material condition labels to be used in identifying material are itemized and their use explained on table 3-2. To preclude inadvertent shipment of unserviceable or condemned material, such material should be stored separately from serviceable material.

(1) The tags/labels conspicuously marked "SERVICEABLE ," "UNSERVICEABLE (REPARABLE)," "UNSERVICEABLE (CONDEMNED)," "SUSPENDED, " or "TEST/*MODIF1CATION," as* applicable, will *contain ad*equate information regarding the identity and condition of the item.

(2) Any additional information or data required to assist in depot material control maybe added to the tags/labels provided that such data are compatible with the prescribed usage of each tag/label.

(3) It is extremely important that material condition tags/labels be protected from being removed, defaced, mutilated, or altered, to avoid duplication of work in redetermining the condition and identification of the material.

(4) These tags and labels may be obtained through normal supply channels.

Table 3-2. Listing of materiel condition tags, labels, and instructions

Materiel condition tags and labels	*Use*
DD Form 1574 (Serviceable Tag—Materiel)	To identify serviceable materiel in condition codes A, B, and C.
DD Form 1574-1 (Serviceable Label—Materiel)	
DD Form 1577-2 (Unserviceable (Reparable) Tag—Materiel)	To identify unserviceable materiel that is potentially restorable to a usable condition. This includes materiel in condition codes E, F and G.
DD Form 1577-3 (Unserviceable (Reparable) Label—Materiel)	
DD Form 1577 (Unserviceable (Condemned) Tag—Materiel)	To identify unserviceable materiel that is condemned as unsuitable for restoration to a usable condition (condition codes H and P.)
DD Form 1577-1 (Unserviceable (Condemned) Label-Materiel)	
DD Form 1575 (Suspended Tag—Materiel)	To identify materiel that is suspended (stocks awaiting classification,
DD Form 1575-1 (Suspended Label—Materiel)	returned materiel awaiting classification, or stock held pending negotiation or litigation (condition codes J, K, and L)).
DD Form 1576 (Test/ Modification Tag—Materiel)	To identify serviceable materiel that requires test, alteration, modification, conversion, or disassembly prior to issue (condition code D).
DD Form 15761 (Test/ Modification Label-Materiel)	

(5) Responsibility for preparation and application of material condition tags/labels will be restricted to quality assurance/quality Control/inspection personnel.

3–608. Preservation and Packing Methods for Material Protection

Inspection of material under a COSIS program may generate a need for a preservation/packing action.

a. *Basic regulation.* The Joint Regulation AR 700-15/NAVSUPINST 4030.28A/AFR 71–6/MCO 4030. 33A/DSAR 4145.7 (Packaging of Material) provides uniform criteria for use by all DOD Components in the selection and prescription of packaging.

b. Detailed criteria. Specific instructions governing basic techniques and details of cleaning, selecting and applying of preservatives, packaging, and packing to protect material against deterioration and damage are prescribed in appropriate Government specifications, standards, and in Service/Agency directives.