

JSP 886 THE DEFENCE LOGISTICS SUPPORT CHAIN MANUAL

Volume 8 SUPPLY CHAIN MANAGEMENT

Part 1 PHYSICAL STORAGE INSTRUCTIONS



MINISTRY OF DEFENCE

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CHAPTER 1 - INTRODUCTION TO PHYSICAL STORAGE INSTRUCTIONS

INTRODUCTION

1. This instruction brigades those physical storage instructions that were previously held in a range of now obsolete publications into a coherent source of policy guidance. The purpose of this instruction is to provide generic storage considerations for equipments and the general responsibilities for personnel in charge of stores facilities of all types. This instruction should be read in conjunction with the linked documents and current legislation.
2. Given the diverse nature of the Defence Inventory, this instruction is not exhaustive; however, new equipments and guidance will be added as requested and advised by Integrated Project Teams (IPT) in consultation with industry. For the purposes of this instruction, the terms 'store' and 'storeroom' is taken to indicate all physical storage locations unless otherwise specified.
3. These instructions are not intended to either describe types of storage facility or replace the appropriate design authorities, and other instructions, that stipulate the specific detailed considerations of storeroom design. Equally, internal layout considerations and store maintenance are the remit of the store holder in consultation with the appropriate command chain. Nevertheless, with the future introduction of a Defence Logistics Information System (Log IS), a joint storeroom template may be introduced at a later date.

OWNERSHIP AND POINTS OF CONTACT

2. The policy, processes and procedures described in the Defence Logistics Support Chain Manual (JSP 886) is owned by Director Joint Support Chain (D-JSC). Head Supply Chain Management (SCM-Hd) is responsible for the management of JSC policy on behalf of D JSC.
3. This instruction is sponsored by DES JSC SCM (Pol Dev) who should be approached in case of technical enquiries about the content:

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GLOSSARY

5. A glossary of Support Chain terms is available in JSP 886 Volume 1 Part 1A.

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LINKED PUBLICATIONS

4. The following publications are linked to this instruction:

- | | | |
|----|--------------------------------|--|
| a. | Joint Doctrine Publication 4-0 | Logistics for Joint Operations. |
| b. | JSP 348 | Air Photography: Regulations for Demanding, Recording, Storage and Disposal. |
| c. | JSP 392 | Radiation Safety handbook – Volume 1. |
| d. | JSP 440 | The Defence Manual of Security. |
| e. | JSP 482 Volumes 1 & 2 | MOD Explosives Regulations. |
| f. | JSP 515 | Hazardous Stores Information System (CD ROM). |
| g. | JSP 800 | Defence Movements and Transport Manual. |
| h. | JSP 800 Volume 4b | Dangerous Goods by Road, Rail and Sea. |
| i. | JSP 886 Volume 3 Part 1 | Standard Priority System. |
| j. | JSP 886 Volume 3 Part 2 | Contractor Logistic Support. |
| k. | JSP 886 Volume 3 Part 4 | Stock Segregation. |
| l. | JSP 886 Volume 3 Part 5 | Packaging for the Handling, Storage and Transportation of Materiel. |
| m. | JSP 886 Volume 3 Part 6 | Equipment for Handling, Storage and Transportation of Materiel. |
| n. | JSP 886 Volume 3 Part 7 | Consignment Tracking. |
| o. | JSP 886 Volume 4 Part 4 | Equipment Procured under UOR Arrangements. |
| p. | SSE Version 4.2 | Support Solution Envelope. |
| q. | Def Stan 81-41 | Packaging of Defence Materiel. |
| r. | Managing Public Money. | |
| s. | ADR Agreement | European Union Agreement Concerning the International Carriage of Dangerous Goods by Road. |
| t. | SSR (1980) | Safety Signs Regulations (1980). |
| u. | The HSWA (1974) | Health and Safety at Work Act (1974). |
| v. | COSHH Regulations 1999 | Control of Substances Hazardous to Health (COSHH) Regulations 1999. |

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|-----|------------------|--|
| w. | BR 2 | Queens Regulations for the Royal Navy. |
| x. | QRs - Army | Queens Regulations for the Army. |
| y. | QRs - RAF | Queens Regulations for the Royal Air Force. |
| z. | BR 862 | Naval Magazine and Explosive Regulations. |
| aa. | BR 1754 | Regulations for the Storage and Handling of Gasoline and other Flammable Materiel. |
| bb. | BR 2002 Volume 1 | Naval Manual of Logistics for Operations. |
| cc. | BR 2000(60) | Naval Marine Engineering Practice – Hull. |
| dd. | BR 3000 | Marine Engineering Manual. |
| ee. | BR.4538 | NBCD Book. |
| ff. | NES 126 | Naval Engineering Specification – Storerooms. |

SUPERSEDED PUBLICATIONS

5. This instruction was informed by a number of publications including JSP 886 Volume 12 and other specific engineering instructions. It also supersedes a number of other publications that pertain to physical storage including:

- | | | |
|----|-------------------|--|
| a. | JSP 886 Volume 11 | Part 3 Chapter 3 and Part 5 Chapter 12. |
| b. | JSP 886 Volume 13 | Leaflets C 9/3, C 9/6, C 9/3, C 9/7, C 9/8, C9/9, C 9/10, C 9/11, C 9/123, C 9/13 and C 9/14 |

CHAPTER 2 – RESPONSIBILITIES

INTRODUCTION

1. Materiel must always be properly handled and stored, not only in the interests of economy, safety and security but with the aim of ensuring that it is readily located and identifiable, fully serviceable and fit for use when required. The way equipment is physically stored will determine its serviceability, life and availability. Consequently this instruction provides general instruction and guidance to cover the major ranges of equipment.
2. These instructions do not, however, cover every eventuality and will not provide the solutions to all storage problems. For ease of reference, a guide to special storage instructions has been included at [Annex A](#) of this Chapter, with more detailed advice in the follow-on Sections. Where specific storage issues arise they should be managed and resolved between the stock holding unit, IPTs as the owners, Materiel Handling Technical Unit (MHTU) and Industry through consultation¹ and should be reflected in the appropriately negotiated Internal Business Agreement (IBA).

RESPONSIBILITIES

3. Notwithstanding the caveat in Chapter 1 Paragraph 3 regarding storeroom design, the following principles are considered common to all storerooms and should inform local orders as well as being considered when establishing temporary stores in operational areas:
 - a. Security of contents.
 - b. Economic use of space.
 - c. Convenient control of stock by segregating items from each other.
 - d. Maximum possible space between racks, to allow access to locations and movement of personnel, materiel and where appropriate mechanical handling equipment.
 - e. Security and stability of items and accounting records.
 - f. Controlled safe access to authorised customers whilst maintaining security of documentation and stock and minimising disruption of work.
 - g. Adequate ventilation, effective temperature and humidity control depending on the type of materiel stored. Stores should be dry, clean and dust free.
 - h. Store labelling, signage and layout are to be in accordance with environment specific instructions and the appropriate mandated legal regulations.

¹ Stakeholder membership should reflect circumstances as appropriate and may include FLC input. SCS (Pol) will advise in cases where agreement cannot be reached and arbitration is required.

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- i. The Defence Fire Risk Management Organisation (DFRMO) should be consulted in order to advise on fire safety precautions and equipment, appropriate risk management strategies and business continuity planning.
 - j. Joint Supply Chain (JSC) and Intermodality² (IMT) compliance.
 - k. HASAW and COSHH legislation and regulations.
 - l. Storage use is appropriate to the store design including floor and rack loading limitations.
4. In addition to the responsibilities in Paragraph 3 above, personnel in charge of stores are to ensure that:
- a. Materiel in store is packaged, clearly labelled and stored in accordance with the appropriate regulations³ and that the necessary precautions are taken to prevent loss, damage or deterioration in store.
 - b. Materiel in store is properly identified, referenced and is correct in quantity and condition, and is accurately located.
 - c. Where possible, materiel remains in its packaging until required. As a general rule, Primary Package Quantities (PPQ) should not be broken open, but when this is necessary due to restrictive storage conditions, the PPQ is to be re-sealed following issues and the label is to be amended to reflect the new quantity.
 - d. Where appropriate stock segregation in accordance with JSP 886, Volume 3 Part 4.
 - e. All Materiel Conditions should be stored separately. Of particular note unserviceable materiel is to be clearly labelled, stating condition and stored separately to serviceable stock to prevent cross-contamination.
 - f. Stored materiel is to be regularly inspected and appropriate action taken when a change of condition is noted or suspected.
 - g. Hazardous items or materiel is to be clearly identified as such and given appropriate storage and handling conditions.
 - h. Storage risk management plans are in place for strategic stocks⁴ and this may include either enhanced protection or storage in multiple locations.
 - i. Stock locations are permanently marked on racks, bins, pallets etc. Chalk or other impermanent markings are not to be used.
 - j. Stock location records are accurately maintained.
 - k. Storage areas are kept clean and clear of accumulations of rubbish or excess packing materials.

² JSP 800 Volume 6 Section 4 refers.

³ In addition to the linked documents in Chapter 1, consideration should be given to other relevant instructions such as standing orders and DINs.

⁴ JSP 886 Volume 3 Part 4 Paragraph 19 refers.

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- l. Fire precautions and warnings are appropriate to the store contents and procedures in the event of fire are regularly exercised. The advice of DFRMO is to be sought as necessary.
- m. The Non-Smoking regulations in storage areas are strictly enforced; smoking materials are not to be carried into hazardous areas.
- n. Stock maintenance is to be conducted in accordance with the appropriate regulations or IBA.

STOCK LOCATION RECORDS

- 5. The location, NATO Stock Number (NSN) and description of stored equipment are to be recorded on an appropriate stock location system. This system is to be maintained for each item of equipment held. Where materiel is dispersed over several locations separate records are to be maintained for each location the materiel is held. Where records are maintained utilising Logistics Information Systems (Log IS), units are to provide a fall-back safeguard in accordance with local orders.
- 6. Stockholders are to amend the stock location to reflect any transactions which causes alteration to the stock location of the item. All stock locations are to be included during mandated stocktaking cycles.

POSITION OF EQUIPMENT IN THE STORE

- 7. When storing equipment the following guidelines are to be followed:
 - a. Items can be easily and safely moved by hand or by the use of MHE.
 - b. Heavy items, where possible, are to be placed on the bottom shelves or on pallets near the entrance.
 - c. Package labels are to face the front.
 - d. Shelf Life items are to be stored to facilitate issue of oldest stock first, with life remaining clearly visible.
 - e. Loose items are to be correctly labelled.
 - f. Irregularly shaped items are to be positioned to prevent excess weight damage.
 - g. Hazards are to be correctly identified, labelled and stored appropriately.

HAZARDOUS STORES

- 8. Hazardous stores are managed in accordance with the JSP 515, Hazardous Stores Information System, which provides a link to current safety data sheets.

PHOTOGRAPHIC STORES

- 9. Photographic stores are managed in accordance with JSP 348, Photography: Regulations for demanding, recording, storage and disposal. This JSP is currently under

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revision; any specific questions concerning photographic storage should be addressed to Defence Intelligence Collection, SO2 (ICP) Policy on BT: 02072 187712.

ATTRACTIVE⁵ ITEMS

10. Any materiel requiring special storage conditions, such as Attractive, Attractive to Criminal and Terrorist Organisations (ACTO) or Classified materiel is to be securely stored and safeguarded. In addition, quantities of these items held in 'ready use' locations are to be appropriate to daily requirements. When not in actual use, 'Attractive' items should be stored appropriately.

PACKAGING

11. Materiel is to be packaged in accordance with JSP 886 Volume 3 Part 5, Packaging for the Handling Storage and Transportation of Materiel.

ISSUES

12. When issuing from stock the following principles are to be observed:

- a. The oldest stock is to be issued first, unless specific serial numbered items are to be picked/ issued first or specific operational needs dictate otherwise.
- b. Loose items are to be issued before boxed or packaged items.
- c. Items stored within Special to Contents container (STC) are to be issued with that STC.
- d. Items of uncertain materiel condition, or suspect stock, are to be quarantined pending inspection by suitably qualified and competent personnel prior to being stored or issued.
- e. Clear segregation of MOD owned and contractor owned stock is to be maintained where required through Contractor Logistics Support (CLS) requirements.
- f. Clear segregation is to be maintained between un-issued stock, stock for return action, defective and repairable action items and stock yet to be bought to charge.

MANAGERIAL CHECKS AND INSPECTIONS OF STORAGE AREAS

13. Logistics staff are to conduct managerial and compliance assurance checks of storage areas as specified in local orders ensuring that:

- a. Items are stored appropriately.
- b. Storerooms are clean and free of arisings that may constitute a fire hazard.
- c. Hazardous materiel is safely stored.

⁵ The term 'Valuable and Attractive (V&A)' has been replaced with 'Attractive'; JSP 886 Volume 4 Part 1 refers.

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- d. Proper management of Shelf Life items. (Lifed Items)
- e. Where required by inventory owners, a periodic test of equipment and materiel is being conducted.
- f. Security managerial checks are being conducted on all stores offices and stockholding area out of normal working hours.
- g. Managerial checks are being properly conducted and recorded in appropriate registers with full details recorded of any incidence found.
- h. Within HM Ships, for those storerooms bordering munitions magazines, Adjacent Compartment managerial checks are to be conducted and recorded in accordance with local orders.

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ANNEX A - QUICK GUIDE TO SPECIAL STORAGE INSTRUCTIONS

(Introduced at [Paragraph 2](#))

Serial	Name	Storage and Preservation	Handling	Packaging and Transportation	Remarks
001	Airframe Components.	Leading edges of rotor blades, aerofoil, etc should be stored on felt or other soft material. Generally airframe components should be retained in their original Special-to-Contents containers (STC). Exceptionally items may be removed from STC where special fitted storage is available for example within HM Ships/RFAs.	Handle with care as high precision standards of materiel are very liable to damage. Cargo nets may be used for embarking/ disembarking air stores only when stores will not be damaged thereby. Technical assistance is required when handling unboxed Rotor Blades, Aerofoil, etc.	IAW JSP 886 Volume 3 Part 5	
002	Apparatus, Electrical.	Electrical apparatus, instruments and their component parts are to be retained in their protective packaging and stored so that the packaging is not damaged. Packaging for equipment particularly susceptible to humidity includes a desiccant and display warning labels so that renewal of the desiccant may be arranged at the prescribed period.		IAW JSP 886 Volume 3 Part 5	
003	Barometer, Mercurial.	Attractive item. Store vertically with the cistern end uppermost and always retain in special boxes provided.	To prevent breakage of the tube by impact of mercury, invert barometers very slowly. Loose mercury should be salvaged from broken tubes and be returned to appropriate returning authority. Protective clothing must be worn when handling loose mercury.	IAW JSP 886 Volume 3 Part 5 Hazardous Item	

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Serial	Name	Storage and Preservation	Handling	Packaging and Transportation	Remarks
004	Barometers, Aneroid.	Attractive item. National Physical Laboratory Certificate supplied with barometer is at all times to be held with the instrument.	Handle with care to prevent glass being broken and needle becoming detached from spindle.	IAW JSP 886 Volume 3 Part 5	
005	Batteries.	Batteries, lead acid, alkaline and, for pilot balloon equipment and cells, primary and secondary, are to be stored in a dry place avoiding extremes of temperature. Batteries and cells should be retained in their original packaging. When supplied in an unpacked condition, care is to be taken not to allow terminals or connectors to touch one another or short circuit by contact with metal.	Care is to be taken not to damage terminals by careless handling. Protective covers and instruction labels are not to be removed.	IAW JSP 886 Volume 3 Part 5	
006	Aircraft Breathing Apparatus. AS IPT (AS3) AES IPT (AEA&SE3)	It is of the utmost importance to prevent the contamination of aircraft breathing apparatus by dust, grease, oils or lubricants, or by the ingress of moisture. Oxygen masks, flexible tubing, oxygen economisers and similar items of aircraft breathing apparatus incorporating either natural or synthetic rubber are to be stored in a cool place, where practicable. Items incorporating rubber tubing which are not already enclosed in containers are to be stored in a darkened place. Whether stored in a container or	French chalk <u>is not</u> to be used as a preservative. Aircraft breathing apparatus, other than that which is packaged, is to be inspected during storage as prescribed for the materials that make up the equipment.	Particular care, under proper supervision, is always to be given to the packaging and protection of all aircraft breathing oxygen equipment, especially in the immediate protection of equipment despatched to the depot or contractor. Since no grease, etc is permitted to be brought into contact with aircraft breathing apparatus, the normal protectives cannot be applied to metallic surfaces and it is necessary to concentrate on providing an effective barrier between the equipment and the atmosphere. Such a barrier	Aircraft breathing oxygen cylinders, when fitted with valves, should be stored containing a residual (lock) charge of oxygen to prevent the ingress of contaminants. Cylinders fitted with 3 way or 5 way pieces should be sealed with the appropriate blanking caps or plugs. Used cylinders may be received partially or fully charged. Cylinders containing pressure above atmospheric pressure can represent a serious hazard when returned to a contractor for servicing; personnel are therefore to

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Serial	Name	Storage and Preservation	Handling	Packaging and Transportation	Remarks
		in the exposed condition, all precautions are to be taken to prevent direct sunlight falling on them.		may be achieved by primary wrappings of Paper, Tissue, Wrapping, DEF 1251, with polyethylene, or polyethylene only where padding is not necessary. Polyethylene bags are not to be exhausted of air because the tautness of the bag may injure the enclosed items. Wrapped items are to be cushioned as necessary and outer containers for overseas despatched within a bag liner of Paper, Wrapping, Waterproof, Crepe, DEF 1239A. Current packaging specifications are however to be observed where applicable. Also IAW JSP 886 Volume 3 Part 5	ensure and certify prior to despatch to a contractor, that cylinders have been reduced to the lock charge pressure not exceeding 7 bar (100 PSI) followed by immediate closure of valves, etc. Unauthorised tampering with plugs, seals or valves or cylinders is forbidden. The kinking of rubber and plastic flexible tubing is to be avoided.
007	Binoculars and Telescopes.	Attractive item. Store in warm, dry conditions. Not to be subjected to extremes of temperature or exposed to direct rays of the sun. Retain in their cases with dust caps kept in position to protect eye-pieces and lenses. The Tri-Service GP Binocular is to be retained in the moulded polystyrene container in which supplied.		IAW JSP 886 Volume 3 Part 5	
008	Cable, Electric.	To be stored in a cool dry location, away from radiated heat and exposure to direct sunlight. Wire and cable is not to be stored with oils, acids or chemicals.	Packaged wire and cable is to be retained in its original wrapping. If a part issue is made, the remaining quantity is to be re-packaged as effectively as possible in such a	IAW JSP 886 Volume 3 Part 5	The responsibilities of logistics personnel with regard assessment of the condition of wire and cable in store is confined to non-

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Serial	Name	Storage and Preservation	Handling	Packaging and Transportation	Remarks
		<p>Wire and Cable on Reels is to be:</p> <p>a. Where diameter permits, stored on reels. Where this is not appropriate it is to be stored in coils.</p> <p>b. Stored with the axis of the reel parallel to the floor. This applies to large diameter reels only, small diameter types i.e. up to a diameter of 45 centimetres may be stored on their sides.</p> <p>c. Stored so as to prevent any pressure being applied to the contents.</p> <p>d. Left in its natural lay, avoiding any unnecessary bending.</p> <p>e. Prevented from making any direct contact with any sharp edges.</p> <p>Wire and Cable on reels must <u>NOT</u> be:</p> <p>a. Bulk stacked, but stored in racks so that the lower layers are not subjected to crushing.</p> <p>b. Rolled over rough surfaces.</p>	<p>manner as to prevent the ingress of dirt or moisture.</p> <p>Only wire or cable that is marked or received with the original manufacturers batch/lot number is to be accepted into store.</p> <p>When putting cable onto a reel, the reel MUST NOT be loaded so fully that the cable is level with the outer edge of the flange. A gap of approximately 50mm should be left to prevent damage to the cable if the reel is rolled. On small reels a 25mm gap is sufficient.</p> <p>When making Issues, the following points MUST be considered:</p> <p>a. All reels or coils of wire or cable MUST have a label attached identifying, manufacturers batch/lot details, NATO stock number and part number. All accompanying paperwork should also include these details.</p> <p>b. Wire and cable is to be issued in strict rotation according to age, oldest stocks being used first.</p> <p>c. When transferring wire or cable from one reel to another, the barrel of the new reel is to be at least equal in diameter to that of the original reel, to ensure contents are not unduly stressed.</p> <p>d. Demands for wire or cable are, wherever possible, to be satisfied on an individual basis to avoid further</p>		<p>technical examination of stock.</p> <p>Additional advice may be sought from Avionics Branch of AC IPT.</p>

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Serial	Name	Storage and Preservation	Handling	Packaging and Transportation	Remarks
			<p>decanting of materials at unit level.</p> <p>e. All issues MUST be packaged in such a manner as to prevent the ingress of dirt or moisture.</p> <p>f. Any unreeling should ONLY be done from the front of the reel and NOT over the side.</p>		
009	Cameras and Accessories.	Attractive item. Store in cool, dust-free compartments; wherever possible retain in protective packaging. Cameras received in the store, which are not over wrapped, are to be protected from dust. Lenses and shutters must not be detached for separate storage. Accessories held separately are to be retained in original packaging.	Lens surfaces are not to be cleaned or touched by other than technical staff. Although of robust external construction, to be dealt with as delicate instruments and all accessories handled with extreme care.	IAW JSP 886 Volume 3 Part 5	
010	<p>Clothing and Accoutrements</p> <p>AES IPT, DC IPT.</p> <p>Uniform and Specialist – General Instructions.</p>	<p>To be stored in a Dry, well ventilated and dust free area away from direct sunlight and excess heat. To be stored clear of the floor and walls.</p> <p>The conditions of the different types of materials that go to make up equipment in the clothing range are also to adhered to(i.e. Boots and shoes under leather and rubber).</p>	<p>It should be borne in mind that moth deterrent cannot be entirely relied upon and that the principal safeguard against moth is for the garments to be kept in clean, well-ventilated storage and stocks turned over as often as possible. Stocks should be checked periodically for signs of damage or deterioration.</p> <p>Lifed NBC stocks are to segregated by batch number.</p>	<p>Wherever possible items are to be retained in original packing or cases. Where necessary items can be over packed for transportation. Visors, goggles and lenses are to be individually wrapped in tissue paper and protected from abrasion and scratching by over wrapping or packing in fibreboard containers. Respirators are normally to be held in a packaged condition. If unpacked they should not be stacked more than three high and are to be over wrapped or otherwise protected from dust,</p>	<p>Flying clothing may contain slide fasteners, studs or electrical wiring and it is essential to store and handle them with great care and avoid over stacking which might cause damage. Items of wired clothing are especially liable to damage by careless handling and although externally of an apparently robust construction they contain wires and gauze which are extremely fragile. All part worn clothing, other than that awaiting disposal, is to be dry cleaned before issue</p>

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Serial	Name	Storage and Preservation	Handling	Packaging and Transportation	Remarks
				dirt and sunlight. See JSP 886 Volume 3 Part 5	to a second wearer. Footwear, other than unlined rubber boots, is not to be worn by a second wearer, but should be disposed of locally. Unlined rubber boots that are held as public clothing are to be disinfected when returned to store. This is to be carried out by swabbing the inside of the boots with a Formalin solution.
011	Cordage, Natural Fibre.	Store in dry, cool, well ventilated conditions. Avoid damp, draught, direct sunlight, contact with oil, water, metals and chemicals. Air space to be arranged between cordage and floor. Oldest stock, suitable for requirement, is always to be issued first. Tallies affixed showing following details; Place and date of manufacture; Standard breaking load; Name of cordage; Yarn size; Length and Date of last test and service for which rope is not to be issued.	Avoid loss, damage or obliteration of last test date on tallies.	IAW JSP 886 Volume 3 Part 5	
012	Electrostatic Discharge Sensitive Device (EDSD)	To be retained in primary/ secondary packaging at all times.	Handle with care. All Returns must be in a static shielding bag over packed for onward transit.	IAW JSP 886 Volume 3 Part 5	
013	Engines. (Piston and gas turbine engines, engine change units, power	To be maintained in a fully preserved condition by engineering personnel as laid down in the appropriate technical publication.		IAW JSP 886 Volume 3 Part 5	When cases are not available, or engines/ ECUs are received without cases, or taken from vehicles/ aircraft into storage, they

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Serial	Name	Storage and Preservation	Handling	Packaging and Transportation	Remarks
	plants, auxiliary power plants, engine modules, reheat units and coupling gear boxes)	To be kept in a cool, dry area. They are to be transported on the appropriate engine stand, enclosed in a sealed re-usable, water vapour resistant (WVR) bag, and packed in the appropriate case.			are to be installed on the appropriate stand in a properly sealed WVR bag, or, if this is not available, provided with a suitable cover to prevent the ingress of moisture or dust.
014	Gas Cylinders- Section 6D. AES IPT, ASI IPT	Dust, Grease, Oils and Lubricants free area	Lifing contained in JAP 100A-01	IAW JSP 886 Volume 3 Part 5	If fitted with valves, to be stored with a residual (lock) charge
015	Gauges, Pressure Valves and Fittings.	Care is to be taken in the storage of gauges held without prejudice packing to ensure that the glass face is not damaged and that no grease or oil comes in contact with the valves or fittings through which oxygen gas, breathing oxygen or enriched air at high pressure is passed.	Warning labels prohibiting the use of grease or oil should on no account be removed from items in store.	IAW JSP 886 Volume 3 Part 5	
016	Aircraft Liferrafts and Life Preservers - AES IPT Inflatable Liferrafts, Floatation Bags, Water Cushions. - ASI/ Platform IPT's (Flotation Bags & Water Cushions)	Dry and well ventilated area, away from direct sunlight or ultra-violet light. Temperature below 25 Degrees Celsius. Humidity less than 75%.	Life on Conditioning. Proofed Fabric over 3 years old not to be used	Packed in Fibreboard containers, then in a Case Wood Packing lined with moisture and grease resisting paper. See also JSP 886 Volume 3 Part 5	Not to be stored in the immediate vicinity of electrical plant in operation. JAP 100B-01 order 0811 for the Assessment of Condition and AP 108E - M, T and F series for the Inspection of Equipment

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Serial	Name	Storage and Preservation	Handling	Packaging and Transportation	Remarks
017	Instruments, Gyro Compass.	Attractive item. Store in a dry, dust-free condition. Maintain at a reasonably constant temperature. Retain in their Special-to-Contents cases, where provided.	Delicate nature, avoid rough handling.	IAW JSP 886 Volume 3 Part 5	
018	Instruments, Meteorological	Attractive item. Retain in Special-to-Contents cases.	Pen arms and pens for open scale barographs and distance reading thermographs are very delicate. All items to be handled with extreme care.	IAW JSP 886 Volume 3 Part 5	
019	Instruments, Optical, (lenses etc).	Attractive item. Store in a dry store not subjected to excessive temperatures.		IAW JSP 886 Volume 3 Part 5	
020	Keys for Money Chests and Security Containers.	To be held in a locked storage for which the Officer with Logistics Charge is personally responsible.	To be handled by custodian only.	IAW JSP 886 Volume 3 Part 5	
021	Materiel Metals for Aircraft Purposes.	Special care is to be exercised in checking materiel which is to be correctly tallied for stock as serious consequences may result if incorrectly identified materiel is used in repairing aircraft and airborne equipment.	Materiel wired in bundles with identification marking stamped on a metal label attached is not to be broken down until required for issue or inspection. In such an event the wiring is to be renewed at the time. When part quantities are issued the portion issued and the balance remaining in stock must bear the correct identification markings, specifications and standard Colour marking. Where doubt exists over identity, technical advice is to be sought.	IAW JSP 886 Volume 3 Part 5	

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Serial	Name	Storage and Preservation	Handling	Packaging and Transportation	Remarks
022	<p>Materiel Liable to Spontaneous Combustion.</p> <p>(Organic Fibrous material such as cotton, sponge cloths, hemp, oakum, coconut fibre, old bunting, collision mats, coir fenders, canvas, flax rug, wood wool)</p>	<p>This materiel is liable to spontaneous combustion, especially when stored in bulk, compressed and when the materiel is wet and damp.</p> <p>Risk of fire is increased by presence of oils, moderate head including sunlight.</p> <p>Materiel should be stored in a cool, dry and well ventilated store on gratings providing clearance of at least 8 – 9 cm between the bottom layer and the base.</p> <p>Stacks should be segregated from fibrous or exfoliated materials that support combustion.</p>		IAW JSP 886 Volume 3 Part 5	
023	<p>Parachutes, Etc. .(including ejection seat fabrics).</p> <p>AES IPT (AAES2</p>	<p>(See AP 108 C and D series), To be stored in a cool, dry and well ventilated area away from direct sunlight and heat. Not to be stored near acids or other corrosive substances and to be kept clear of sharp instruments.</p>	<p>Drogue Withdrawal Lines have a 6 year finite life; all other Fabrics in this category have a 10 year finite life.</p> <p>Details regarding "Lifeing" are contained in DAP 108A-0006-2(N/A/R)1.</p> <p>Regular inspections of equipment are to be carried out and any signs of deterioration such as mould growth, bleaching, abrasion or tears of the webbing, or any serious corrosion of metallic parts are to be notified to the AES IPT.</p>	<p>Wherever possible items are to be retained in original packing or cases. Where necessary items can be over packed for transportation</p> <p>See also</p> <p>JSP 886 Volume 3 Part 5</p>	<p>On Unit: To be stored in the Survival Equipment Section (SES) or appropriate Supply Squadron Stores.</p> <p>Depot: Stored as outlined</p>

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Serial	Name	Storage and Preservation	Handling	Packaging and Transportation	Remarks
024	Rubber.	<p>Store in cool dark environment for protection against sunlight and artificial light. In addition, protection is to be provided against conditions which cause the properties to deteriorate. Causes of deterioration include ozone; external contaminants such as grease, oil, or solvents; contact with catalytic metal ions and high ambient humidity.</p> <p>Rubber sheeting should be laid flat, and all surfaces covered with Dusting Powder.</p> <p>Rubber tubing is to be coiled avoiding kinks. Rubber washers, small tubing, etc should be covered with Dusting Powder.</p>		IAW JSP 886 Volume 3 Part 5	
025	<p>Safety Belts (non-aircraft), Harnesses, Lanyards and Associated Equipment.</p> <p>AES IPT (AAES2)</p>	<p>To be stored in a cool, dry, dark and well ventilated area away from direct sunlight and heat. Not to be stored near oils, acids or other corrosive substances and to kept clear of sharp instruments.</p>	<p>Fabrics in this category have a 10 year finite life. Details regarding "Lifeing" are contained in DAP 108A-0006-2(N/A/R)1</p> <p>Regular inspections of equipment are to be carried out and any signs of deterioration such as mould growth, bleaching, abrasion or tears of the webbing, or any serious corrosion of metallic parts are to be notified to the AES IPT.</p>	<p>Wherever possible items are to be retained in original packing or cases. Where necessary items can be overpacked for transportation Unless already packaged, items are to be wrapped in moisture and grease proof paper. In addition for transportation - to be packed in Cases Wood Packing (CWP) lined with Paper, Wrapping, Waterproof, Crepe, DEF 1239A. Any metal parts to be protected from corrosion. See also JSP 886 Volume 3 Part 5</p>	<p>Racks are to be curtained in such a manner as to permit free air circulation but prevent exposure to sunlight, dust, etc. and are to be free of oil, grease, paint and other fluids. Bare metallic parts, or those which are plated or tinned, are to be examined before being placed in storage. Where they have become chipped or bared they are to be cleaned and touched-up with the appropriate paint.</p>

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Serial	Name	Storage and Preservation	Handling	Packaging and Transportation	Remarks
026	Sonar Equipment.	Transducers are to be retained in store in the Special-to-Contents inner box as received until required for fitting. Sonar Domes and Cages are equally to be stored in their full transport cases.		IAW JSP 886 Volume 3 Part 5	
027	Tools.	Tools generally to be stored in preservative packaging as received. Cutting tools eg. plane blades, files, chisels, stored so as not to damage cutting edge(s).		IAW JSP 886 Volume 3 Part 5	
028	Tyres (outer covers) and Inner Tubes.	Attractive items. Store in a cool place, sheltered from light and draughts. Tyres to be stored on edge, inner tubes unfolded, if possible, dusted with powdered rubber dusting and slightly inflated.		IAW JSP 886 Volume 3 Part 5	
029	Radioactive Items.	Store in packaging or specially designed sprung crates as received. In ships, storage where minimum shock due to ship's movement will be experienced should be selected. Radioactive items, such as valves/ RADIAC sets are at all times are to be stored in their STC, so that protective markings are clearly visible.	Handle with extreme care using only the minimum of movement. For procedures relating to the handling of radioactive items see JSP 392.	IAW JSP 886 Volume 3 Part 5	

CHAPTER 3 – STORAGE OF SPECIALIST MATERIEL

SECTION 1 - METALS AND METALLIC MATERIEL

Introduction

1. This Section provides storage guidance for metals.

Racks

2. The procedure for maintaining the identity of stored metals is at the Annex to this Section. The following considerations are equally specific to metal materiel:
 - a. Metal should be stored on racks made of the same metal. Dissimilar metal, including racking should be separated by a non-metal material such as plastic.
 - b. Lengthy pieces of metal are to be supported throughout their length to reduce sagging.
 - c. When stacking light sections, or thin walled tubing, care is to be taken to avoid any crushing due to the accumulated weight of the stack.
 - d. Metal materiel stored in cases are to be raised clear of the floor on dunnage.
 - e. Condensation will be reduced through circulation of air around and through stored materiel.

Preservation

3. Preservation treatment for metals is in accordance with DEF STAN 81-41.

Remedial Measures

4. It is essential that any remedial treatment of light alloy, plated and all thin gauge materiel is undertaken only with concurrence of the appropriate engineering authority. Such treatment, if incorrectly carried out, may lead to the issue of materiel which is in a dangerous condition.
5. Immediate action is to be taken to renew any damaged protective film.

Corrosion of Metallic Materiel

6. Corrosion may damage the mechanical properties of metals and render them unserviceable, consequently stores staff should be aware of the following common types of corrosion:
 - a. **Aluminium and its Alloys.** On aluminium and its alloys initial corrosion is a light 'bloom' which develops into a white powdery deposit. This deposit is normal and protects aluminium from further corrosion. More advanced corrosion may lead to the formation of deep pits and blistering.

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- b. **Magnesium and its Alloys.** Magnesium products are usually protected by a chromate finish. Incipient corrosion is readily seen as a white powdery deposit, which can rapidly spread, giving rise to multi-colour corrosion products and deep pitting.
- c. **Copper Based Alloys.** Corrosion of copper-based alloys takes the form of verdigris, a blue green corrosion product.
- d. **Ferrous Materiel.** Ferrous materiel corrodes by rusting and in a maritime atmosphere some grades of 'stainless steel' will also rust.

Types and Appropriate Handling of Metallic Materiel

- 7. **Identification.** Identification of metals and their Colour Markings is to be in accordance with STANAG 4044. [Annex A](#) to this section details the means by which metal is to be identified in storage.
- 8. **Bars, Rods, Extrusions and Tubes.** Items in this category may be stored in pallets, unit loads or horizontally in racks, dependent upon cross section and length. Stored metals are not to protrude beyond the rack frame and are to be supported at regular intervals along their entire length. Equally heavy and bulky items should be stored at or near the base of the rack.
- 9. **Storage.** Where racks are not available or where their use is impracticable materiel may be stored horizontally within the safe carrying capacity of the floor. Such stacks should contain materiel of one stores reference and batch number only.
- 10. **Damage Avoidance.** To avoid scratching, tinned steel sheets should be preserved and interleaved with paper. Paper should be of a quality that is innocuous to reduce staining and corrosion. On receipt, aluminium and aluminium alloy sheet metals are to be stored with protective treatment. Care is to be taken with regards polished surfaces.
- 11. **Sheets for Ground Use.** If preserved and wrapped, sheet metals for ground use may be stored either vertically or horizontally in racks, provided that care is taken to prevent buckling of the sheets.
- 12. **Sheets for Airborne use.** Sheet metal for airborne use is to be handled with extreme care, avoiding dragging one sheet across another. Burred or damaged edges will inevitably scratch the sheet below. To avoid damage aircraft standard aluminium alloy sheet metal is supplied lanolin coated, polythene vinyl wrapped in special to type wooden crates. These crates are either to be block stacked or stored on pallet racking.
- 13. **Single Sheet Storage.** When single sheets are to be stored out of a crate, they are to be protected with a fibreboard material and banded in such a way as not to stress or bear upon the metal. The sheets are then to be stored horizontally on shelves. The racking to be used is adjustable beam pallet racking filled with shelf panels. Sufficient beam levels should be used to allow single sheets to be stored on a shelf.
- 14. **Strips, Foil and Gauze.** Flimsy strips, foil and gauze are to be stored coiled round wooden formers and suitably protected from mechanical damage. The more robust of these forms of materiel are to be stored tightly coiled without formers.

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15. **Wire and Cable.** Wire and cable of thickness less than 16 SWG (1.6mm) are to be stored neatly and properly coiled on formers. The thicker gauges, winding on spools or formers is desirable but not essential. When spools or formers are not used, wire and cable are, to be stored properly coiled, avoiding any kinking or tangling.

16. **Inspection.** Where required, metallic materiel subject to quality surveillance is to have an appropriate chain of inspection responsibility, from initial manufacture until the materiel is issued to the user.

17. **Traceability Through the Use of the Certificate of Conformity.** A Certificate of Conformity (CofC) is necessary to confirm the metal supplied meets the specification demanded and, should a fault be found later, provide details which allow other metal from the same batch to be traced and corrective action considered.

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ANNEX A - PROCEDURES FOR MAINTAINING THE IDENTITY OF STORED METALS

(Introduced at [Paragraph 7](#))

Introduction

1. **General.** Metal Materiel will be delivered from contractors under cover of a certified Mod Form 640 Advice and Inspection Note supported by an approved Firms Release Note and Certificate of Conformity (CofC), and should be identified by the overall/ line marking or colour code as laid down in DEF STAN 05-09.
2. **Description.** The description shown on the release document (CofC) for the materiel will be specified in the contract schedule for supply, and will include the stores reference number and full nomenclature.
3. **Action on Receipt from Contractors.** The following actions are to be taken in respect of receipts from contractors:
 - a. Check the relevant release documents and certificates to ensure that identity, batch and cast number or manufacturers serial identification, as appropriate, are correct and the materiel has correct identification markings.
 - b. Materiel that cannot be correlated with the release document, or that have not been correctly marked, is to be held '*in quarantine*' pending investigation with the Quality Officer at the manufacturer's works.
4. **Action on Receipt from Service Units.** The following actions are to be taken in respect of receipts and serviceable stocks from Service units:
 - a. Correlate the relevant voucher in respect of identity as the specification, Batch or Case Number and CofC. This correlation is to be carried out at once, ensure that materiel may be brought on charge with the least possible delay.
 - b. Check that materiel is fully and accurately identified.
 - c. Where there is doubt as to the specification, identity or stores reference, materiel is to be '**quarantined**' until complete identity is established through investigation with the consignor unit.

Storage

5. **Mass-Bins.** After verification of identity, consignments may be stored mass-binned, except consignments of materiel in the following classes which are to be stored by their stores references in batches as received:
 - a. Batches of materiel for which CofCs are required.
 - b. Batches of materiel of ruling dimensions 19mm or less which are supplied bound together in bundles, with identification markings stamped on metal label attached.

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c. Metal tubing over 19mm in diameter may be mass-binned providing that each length line is marked or stamped at one end with the specification number and that any remaining specification marks are stamped on the metal label. Such materiel need not be stored in batches, unless annotated as aircraft materiel.

6. **Materiel Supplied Bundled.** Where materiel is supplied in bundles, the following applies:

a. Several bundles of materiel of the same specification and stores reference may be stored in one location, providing each bundle is securely bound, with a metal label attached.

b. Bundles of different batches are not to be broken and materiel mixed as in mass-binning. The binding of materiel supplied in bundles should not normally be broken until an issue is required to be made; the binding is to be renewed at the earliest opportunity.

c. It is the requirement of every piece of materiel which is supplied bundled to be line/colour marked or individually tagged, irrespective of size.

7. **Re-identification.** Should the identity of the materiel be in doubt, due to the absence or illegibility of marking, identification stamp, or other reason, no attempt at re-identification is to be made until the specification has been definitely established (ie by submission of a sample for test). Where it is necessary to re-mark, such marking is to be carried out under appropriate supervision.

8. **Issue Action.** The following action is to be taken in respect of issues:

a. Metals selected for issues are to be bound together with a securely attached metal label quoting the specification of the materiel. Bundles which are broken for the purposes of issue are to be securely re-bound, with the original metal label attached. This is particularly important when several bundles are stored at one location. Every endeavour should be made to issue from one batch number.

b. Whenever it is necessary to cut a standard length of materiel, it is imperative that the pieces are fully identified. When materiel is not overall/line marked any transfer of markings is to be carried out under appropriate supervision. The part of the materiel having the original markings is to be issued last.

Control and Certification of Aerospace Metals.

9. For some aircraft materiel supplied in other than their final heat treated condition, the Aerospace materiel specification states the temperatures at which heat treatment is to be effected. These temperatures vary with the permissible variation in chemical composition and the recommendations for the heat treatment for each batch or cast. This information will be quoted by the manufacturer on the release document CofC, which is necessary to meet Aircraft materiel control and traceability requirements.

SECTION 2 - RUBBER AND ELASTOMERIC MATERIEL

Introduction

1. This Section provides storage guidance with regards rubber and elastomeric materiel including vulcanised rubber, products, assemblies or components made from vulcanised or thermoplastic rubbers. It is applicable to both solid and cellular rubber materials for aerospace and general purposes.

Policy

2. **Exclusions.** The following materiel and items are excluded from the storage life policy defined in this section:

- a. Rubber based adhesives, coatings and sealants.
- b. Rubber adhesive backed tapes.
- c. Uncured materiel, for example un-vulcanised fuel tank repair materiel.
- d. Composite rubbers such as, rubber cork gaskets and rubber asbestos packaging.
- e. Mechanical or electrical equipment assemblies, which contain parts, made from rubber.
- f. Flexible plastics, which are not elastomeric such as plastics that do not possess the same properties as rubber including Polyvinyl Chloride (PVC) and Polytetrafluoroethylene (PTFE).

3. **Foreign Sourced Items.** The policy for shelf life items provisioned from other nations is, as far as is reasonably practicable, to comply with the appropriate specifications of the country of origin. For aerospace items this will generally be indicated on the item packaging.

4. **French Produced Products.** In addition to these classifications above, France produces elastomeric products, which are defined as having an accessory function only. These French made items have no life limitations and are generally rejected on a visual inspection basis. If such an item was to cause uncertainty, or is considered 'out of life' by UK authorities, they must be quarantined immediately and referred to the relevant UK IPT.

Storage

5. **General.** All rubber materiel, even when correctly compounded and cured, will deteriorate with age. However, correct packaging and controlling the environment within which the rubber is stored can retard the process of degradation; in terms of shelf life methodology the following is relevant:

- a. Rubber components contained within mechanical assemblies such as, hydraulic valves should utilise the supplier's recommended shelf life. Any doubt as to whether an item should be held or stored as an 'assembly' should be directed to the relevant IPT's engineering authority who will advise accordingly.

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b. Unassembled rubber components or materiel are to be stored in a dry, well ventilated location, away from other equipment. Ideally, rubber should be stored in self-contained storage where the storage conditions detailed below can be maintained.

6. General storage conditions assemblies should be stored in their Special to Contents containers (STC) where appropriate or in their original packaging. In addition:

a. Storage temperature should be below 25°C with items stored away from direct sources of heat. Any articles stored below 15°C are to have their temperature raised to 20°C (room temp) throughout before being issued.

b. Moist conditions and condensation are to be avoided; relative humidity is to be less than 75%.

c. Rubber is not to be exposed to sunlight or intense artificial lighting with a high ultra-violet light content.

d. Ozone has a deleterious effect on rubber, and may be increased by electrical discharge of generators or motors; therefore, rubber equipment must not be stored in the immediate vicinity of electrical plant in operation.

e. Where rubber is stored in metal containers, it is to be prevented from direct contact with metal by layering with polyethylene sheeting.

f. Copper containers are not to be used for packaging or storage of rubber.

g. Rubber to metal bonded items should be stored so that the metal is not in contact with the rubber except at the bond.

h. When storing rubber equipment with fabrics, care is to be taken to ensure that the fabric does not become damp, as this would cause rubber damage.

i. No oil, grease, acids, disinfectant or cleaning fluid is to be allowed to come into contact with any rubber materiel during storage, unless such compounds are by design an integral part of the component or packaging.

j. Rubber items must be stored in a 'relaxed condition', that is free from strain in the form of tension, compression or deformation.

k. Refuelling hoses are to be capped in store, and when cut lengths are supplied the cut length should be capped as well as the residual stock in store.

l. Contact between rubbers of different compositions and colours to be avoided.

m. Proofed fabrics and rubber sheeting with areas of approximately 1m² square or less than 2m in length is to be stored flat, with layers interleaved for protection. Larger areas and longer lengths of materiel should be rolled, with layers again interleaved by a suitable material, such as opaque polyethylene sheeting.

n. If practicable, large diameter rubber tubing is to be stored in straight lengths.

o. This is to reduce 'exposure cracking' from coiled rubber tubing were the outside of each turn of the coil is in slight tension.

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7. **Age on Delivery.** Elastomeric items should be received from the supplier with maximum possible initial storage life remaining. Procurement authority or IPT agreement is to be obtained prior to receipt of items which do not satisfy the following age criteria:
- a. **Elastomerics Produced by a Single Manufacturing Process.** Elastomerics such as sheet seals or hose devoid of fittings that have been produced by a single manufacturing process are to have no more than 6 months shelf life consumed; evidenced through a 'cure date' that is within 6 months of receipt. Where materiel is marked as 'quarter and year', then not more than 1 quarter may have elapsed.
 - b. **Elastomerics Produced by More than One Single Manufacturing Process.** For elastomerics such as hoses with integral fittings, which are the subject of more than one manufacturing process, the items are to be received into store with no more than 12 months of shelf life consumed calculated from oldest cure date. Where materiel is marked as 'quarter and year', then not more than 3 quarters may have elapsed.
8. **Age on Issue.** Issues of elastomerics must have no less than 6 months life remaining on issue. The only exceptions to this rule are:
- a. All issues of elastomerics to RN and RFA ships are to have at least 36 months life remaining.
 - b. Directorate General Saudi Armed Forces Projects items are to have a minimum of 75% of their life remaining when issued to the Saudi Armed Forces.
9. **Storage Life.** The storage or shelf life of an elastomeric is determined from its date of cure or manufacture which should be marked on the item labelling in the form of quarter and year of cure (eg 1Q 02).
10. **Classification of Elastomerics.** Rubber types are classified according to their relative susceptibility to deterioration and are divided into 4 groups (A, B, C and X). The life grouping is shown on the identification label for each item and when packaged and stored, as detailed above, the initial shelf life for each group is:
- a. **Group A Rubbers.** Group A rubbers have an initial shelf life of 5 years from cure date with a possible 2 year life extension subject to their inspection.
 - b. **Group B Rubbers.** Group B rubbers have an initial shelf life of 7 years from cure date with a possible 3 year life extension subject to their inspection.
 - c. **Group C Rubbers.** Group C rubbers have an initial shelf life of 10 years from cure date with a possible 5 year life extension subject to their inspection.
 - d. **Group X Rubbers.** Group X rubbers are deemed to have no shelf life and require no periodic technical inspection whilst in storage. For stock rotation purposes only, they are to have an assumed initial storage life of 10 years, calculated from the cure date, when the original product requirement is re-examined. Subsequent re-examination is to be carried out at 5 year intervals. Issue of this group of rubber is authorised at any age subject to its packaging remaining intact and that the subject items inspection before use.

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11. **Stock Rotation.** Efficient stock rotation should ensure that items in stock are consumed before their initial storage life is exceeded. Issues are to be made of the oldest stock first, unless otherwise specified. Supply and engineering staff within IPTs are to be aware of the shelf life of the items for which they are responsible.

12. **Life Extension.** IPTs are responsible for authorising shelf life extensions and managing the necessary shelf life inspections; stocks should therefore be referred to IPTs prior to any planned disposal.

SECTION 3 – INSTRUMENTATION EQUIPMENT

Introduction

1. Specific advice on the storage of instrumentation equipment is to be in accordance with the manufacturer's recommendations, with advice being sought from the owning IPT as appropriate. This section is aimed at setting out the general principles of storing fragile and sensitive to damage instrumentation.
2. Although the function of these items varies considerably, for the purpose of storage they bear a marked similarity.

General

3. General storage instructions for instrumentation include:
 - a. Where possible a separate instrument store is to be provided; this store must have a dry atmosphere and be maintained evenly between 5°C and 21°C to prevent corrosion.
 - b. Special instructions on packaging are to be strictly observed.
 - c. Damp and dust are to be minimised within the store.
 - d. Apertures of instruments are to be blanked off, using ventilated blanks where necessary, to prevent ingress of dust. Technical advice should be sought from IPTs.
 - e. Items are not to be lifted by attachments such as, loose wires, tubes or flexible drives.
 - f. Air operated instruments, such as altimeters, airspeed indicators and barometers must not be sealed in polythene bags.
 - g. Instruments are to be retained in their packaged condition until required for use.
 - h. Store with care, to avoid jarring, shock and damage to calibration settings.
 - i. Unserviceable and repairable items are to be handled and stored in the same manner as serviceable items to reduce further damage.
 - j. Where Special to Contents containers (STC) have been provided, the item is to be stored and handled in the STC.
 - k. Unpackaged flexible drives are to be stood full length on shelves or racks. When resort to coiling is necessary, the coil is not to be less than 76 cm in diameter. Squared drive ends are to be coated with a mineral jelly to prevent corrosion. Protective screw caps are to be fitted, but where the caps are not supplied, technical advice should be sought from IPTs.
 - l. All glass tube thermometers containing alcohol or mercury are to be stored vertically. Instrumented thermometers of the aircraft type are to be packed and stored in such a manner that the connecting lines do not become fractured through excessive bending, and that no joints in the system are broken down.

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m. Ball bearings, races and pivots supplied as spare parts for instrument servicing tasks should be stored in accordance with IPT advice.

n. Magnetic compasses are particularly fragile instruments, requiring special care during handling and storage. Compasses are always to be stored in the special containers supplied. They must be stored upright so that the magnetic pivoting mechanism is free to revolve. Packaged compasses may be stored close together and stacked one above the other if so required. They are not to be stored near electrical apparatus or in the vicinity of magnetic or electromagnetic fields. When compasses are removed from aircraft or ships for long or short term storage, they are to be labelled to show the ship / aircraft type and name / number and the position from which they were removed.

- (1) Infra-red devices must have lens caps fitted when the item is in storage.
- (2) Optic head devices are extremely fragile and IPT advice should be sought with regards their storage.
- (3) Inertial Navigation Platforms and Gyroscopic Equipment items are highly sensitive and are to be stored in their provided STCs, with appropriate warning labels in place. Locking devices are to be employed when fitted.

SECTION 4 – MOTOR VEHICLES, ENGINE SPARES AND ACCESSORIES

Introduction

1. Specific storage advice on storage of MT items is to be in accordance with the appropriate Army Equipment Support Publications (AESP) and manufacturer's recommendations, with advice being sought from the owning IPT as appropriate. The purpose of this section is to provide general advice on storage of MT items.

Storage

2. **Awnings, Aprons, Hoods, Tilts, Cushions, etc.** Items containing fabric or leather articles are to be stored in a dry environment. Where possible awnings, aprons, hoods and tilts should be hung from the reinforced eyelets at the edges. When storage space does not permit this method of storage to be employed, the items are to be lightly folded, bundled in fives and wrapped in paper or clean hessian to protect them from dust and dirt. Contact with oil or grease is to be avoided.
3. **Axles, Gearboxes, Steering Gears, Pumps, etc.** Axles, gearboxes, steering gears, pumps and similar complete assemblies are best stored in the containers as received. Exposed joints, couplings and 'moving' parts are to be treated in accordance with IPT instructions. All orifices should be sealed with all exposed main screw threads and all machined surfaces, especially at sharp edges, protected from damage.
4. **Clutch and Brake Linings.** All clutch and brake linings must be stored in their original packaging; any items not packaged must be loosely wrapped in paper. All friction material spares should, where possible be stored in accordance with manufacturers recommendations, where this is not available store in a cool dry environment and not subjected to direct sunlight.
5. **Radiators.** Whenever possible, radiators are to be stored in the containers as received; otherwise they are to be stored on racks supplemented by constructed frames so that the weight is taken by the fixing brackets on the sides of the radiators. All orifices are to be blanked.
6. **Glass Surfaces, Windscreens and Window Glass.** Glass surfaces are to be wrapped in a thin paper and stored separately in cases, with a bed of cushioning material to prevent contact between the glass surface and the sides of the case. Any loose metal parts, if placed in the same case, must be secured to prevent damage to the glass. Separate portions of glass are to be stored on edge in wooden racks. When the various parts of frames are plated, these portions are to be wrapped in soft paper. Safety or plate glass surfaces are to be stored on edge in wooden racks, a sheet of soft paper being placed between the plates to avoid scratching. Extremes of temperature are to be avoided and all glass surfaces are to be examined periodically for chipped and cracked glass. Safety glass should if possible be stored in the dark to prevent 'crazing', but if this is possible then it be protected from direct sunlight.

SECTION 5 – WORKSHOP PLANT

General

1. **Cranes.** All bearings and gears of cranes are to be kept oiled and well greased. In order to free the bearings of small cranes which are stored completely assembled, a load should, at periodical intervals, be attached to the hook and the crane worked and wheeled a short distance, due regard being paid to the safe working load shown on the test certificate. All revolving parts of cranes stored in a dismantled state are to be turned by hand periodically.
2. **Forges.** All working parts are to be well greased and where accessible blower motors are to be turned periodically.
3. **Differential Tackles.** The pulleys are of cast-iron and easily broken. The tackles are not to be dragged along the floor, but are to be lifted or wheeled on a truck. In store, the chain should be coiled and the tackle hung by the hooks. The bearings of the pulleys should be well oiled and kept free by working the tackle periodically.

Machine Tools Accessories

4. **Care.** Machine tools accessories are to be treated with every care. Small articles such as milling cutters and mills, small cutters, machine reamers, etc, after preservation and wrapping should, in addition, be stored in cartons. Suitable separation of such items when not stored in individual cartons will be needed to protect cutting edges.
5. **Cutting Tools.** On receipt into store after use cutting tools wiped over and examined before being treated with a suitable temporary preservative and placed in store. Where metal storage bins are used, cutting tools are not to be laid in contact with the metal. Oiled linen, paper, or strips of well seasoned wood should be placed between the tools to protect their edges and keep them free from condensed moisture which collects on surfaces in a damp atmosphere.
6. **Side and Face Milling Cutters.** Side and face milling cutters are not to be stacked one on another. This form of storage is liable to lead to the chipping of cutting edges, particularly when the cutters are being withdrawn from the bin. Such cutters, if cartons are not available, should be stood on edge in compartments so arranged that each compartment will hold one pair of cutters, particular care being taken to avoid damage to the cutting edges.
7. **End Mills.** End mills below 32mm diameter should be laid horizontally if containers are not available, as, if placed on end, they are liable to fall over. The larger sizes should be stood on end, particular care being taken to avoid damage to the cutting edges.
8. **Small Cutters Provided with Arbors.** Unless stored in boxes, small cutters provided with arbors should be placed with the arbor towards the opening of the storage bins.
9. **Lathe Gear Wheels.** Lathe gear wheels are to be wired or bolted together in sets and labelled. When wire is used the wheels should be secured at opposite sides to prevent bouncing or jarring against each other when subject to movement.

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10. **Milling Machine Arbors with Collars and Nut.** The nut holding the collars in milling machine arbors is to be slackened off, otherwise the arbors will in time, bend out of truth.
11. **Dies and Die Heads.** Dies and die heads are to be kept in sets in cartons.
12. **Band Saws.** Band Saws are, after greasing, to be kept coiled in a ring of about 610mm in diameter and laid out with teeth upwards on shelves or hung in a suitable position. Band Saws, which have their ends brazed together forming a continuous band, are difficult to handle and, whenever possible, should be left as coiled by the manufacturer. Should it be necessary to re-coil such a saw, great care is needed to prevent over-straining of the metal where bends occur.
13. **Circular Saws.** Circular saws are to be well greased with Protective PX-11 and laid surface to surface on shelves. Where suitable shelves are not available the saws should be kept bolted between two discs of well seasoned wood slightly larger than the saw; in no circumstances is oak or sweet chestnut to be used. Greaseproof paper is to be inserted between the discs and the saw.
14. **Polishing Bobs, Mops and Brushes.** Polishing bobs, mops and brushes are not to be allowed to come into contact with oil or moisture. Oil destroys the fabric and brushes are ruined by damp.

Grinding Wheels

15. **Handling.** Grinding wheels are extremely brittle and require careful handling if loss due to breakage is to be avoided. Dropping or careless stacking of the wheels may not, from a casual glance, leave any marked effect, but if this negligence has caused even an unnoticeable crack, trouble may develop later during use. Cup and disc wheels are to be treated with special care. It is important in all grinding wheels that the centre hole or bush is not damaged.
16. **Unpacking.** Before leaving the manufacture grinding wheels are packaged in a manner designed to safeguard them against the treatment likely to be given during transportation. The protection afforded by the package should be retained for as long as is practicable and the wheels should normally be retained in the packaged condition until required for use. When it is necessary to unpack the wheels all reasonable care is to be taken and the wheels should be examined for condition and to see that the grain, grade and other specifications correspond with the identification labels before they are placed in storage.
17. **Stacking.** Grinding wheels are to be stacked on shelves, guards being fitted, as necessary, to prevent the wheels from falling off. The wheels are to be arranged in a manner facilitating their ready and correct selection when required.
18. **Straight Wheels.** Straight wheels are normally to be stored on edge. Straight wheels which are not over 152mm diameter and which are manufactured by the silicate or vitrified process, may be stored either flat in stacks or on edge whichever is more convenient. When the wheels are stacked, paper washers should be placed between.
19. **Shaped Wheels.** Saucer and cup wheels may be stored flat in stacks or on edge, as convenient. If however, there is a thin edge to the wheels it is advisable to stack them flat, particularly wheels of the softer grades. Cup wheels over 152mm diameter and all cylinder wheels should be stacked flat. Tapered cup wheels should be carefully stacked with the

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back side up. Silicate wheels are to be stored in a dry place. Rubber wheels over 6mm thickness are to be stored on edge. Wheels of 51mm and less in diameter are best protected by storage in cartons or divided drawers clearly labelled on the outside with the grain and grade.

20. **Elastic Wheels.** Elastic (resinoid shellac and rubber bonded) wheels of a thin type, ie 6mm or less thickness, are to be laid flat on shelves having a plane surface. A block of slate under each pile will prevent warping. Elastic wheels are to be stored in a dry place.

21. **Carrying Large Wheels.** When carrying wheels of 508-711mm diameter about 60 or finer grade it is best to use a transporting platform, placing the wheels flat on their sides with thin wooden boards between each wheel. Wheels larger than 711mm diameter, both for convenience of handling and prevention of breakage, should be carried on trucks with supporting pieces arranged, where necessary, to retain the wheels in a vertical position.

22. **Issue for Fitment.** When supplied, grinding wheels bear a maker's label showing the grit and grade of the wheel. Upon issue for fitment to the machine the inventory holder is to note these details and the machine to which the wheel is to be fitted, so as to save any subsequent difficulty or identification when replacement falls due.

SECTION 6 – GROUND SUPPORT EQUIPMENT

Introduction

1. The purpose of this Section is to provide general instruction for the storage of Ground Support Equipment (GSE). Aircraft and weapons are greatly dependant upon GSE and it is therefore necessary for Supply staffs to pay particular attention to the storage conditions of this type of equipment. The following paragraphs contain general instructions, whilst specific advice should be sought from IPTs as required.

Definition

2. GSE items of non-airborne mechanical and electrical equipment used in the maintenance or operational support of aircraft and associated systems, weapons systems, airfield facilities, mechanical transport, synthetic trainers and ground radio installations. GSE includes standard and special-to-type GSE and Aerospace Ground Equipment (AGE) but it does not include Electrical Engineering Test Equipment (EETEC).

Storage

3. **General.** In preparing GSE for storage the appropriate technical advice should be sought and items should be stored accordingly, the further technical functions below are to be carried out by or under technical supervision:

- a. Small engines are to be inhibited in accordance with instructions for similar MT equipment and suitably crated.
- b. Compressor units are to be treated, as far as possible, as for small engines above.
- c. Where practicable, rubber tyres fitted to GSE are to be raised off the ground or floor and, if pneumatic, partially inflated. These tyres are to be labelled appropriately. Tyres not raised off the ground, for local storage reasons, are to be inflated to their normal operating pressure.
- d. Axle bearings, bushes and other Metal working parts are to be well greased; other machine surfaces are to be treated where necessary with suitable protective materiel.
- e. Chassis are to be clean and greased as necessary.
- f. Special-to-type batteries accompanying major equipment are to be in a fully charged and serviceable condition and are to be adequately secured. Cables are to be disconnected from battery terminals and affixed to the equipment in an electrically safe manner.
- g. The fluid in hydraulic jacks is not to be drained off. The rams are to be in the lowest position, the pressure released and the release and air valves left open to allow the jack to breathe during changes in temperature. Jacks are to be stored in an upright position; if they are laid on their sides oil runs to the lower side of the cylinder and washer, allowing the upper half of the washer to dry and shrink away from the cylinder wall.

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4. **Wooden Articles.** Ladders and similar articles of GSE, when held in quantity, are to be stacked on battens or wood blocks spaced according to the constructions of the articles. Battens, etc, are to be interposed between each layer of the stack and arranged to prevent warping of the equipment. Protection against high temperatures or dampness is to be provided where these conditions arise.

5. **Metal and Rubber Items.** Metal and Rubber items are to be stored in accordance with IPT instructions and the specific materiel instructions in the relevant sections of this instruction.

SECTION 7 – ACCOMMODATION STORES

Purpose

1. The purpose of this Section is to indicate the storage requirements for Accommodation Stores.

Storage

2. **China, Earthenware, Glass and Plastic Ware.** Owing to the fragile nature of this equipment care is to be taken during unpacking and every precaution is to be taken to prevent accidental breakage during storage. Packaged items are to be stored intact until required for use, unless damage is suspected. If stored out of containers in which they were received, china, earthenware, glass and plastic articles are to be securely stacked on shelves of storage racks or in cupboards; the height of stacks being governed by the shape and size of the articles. For general guidance large plates and small earthenware dishes are not to be stacked more than 30 high; medium dishes not more than 25 high and large dishes not more than 15 high.

3. **Glassware and Crystal.** These items should not be nested owing to the increased liability of breakage. Storage at an even temperature is desirable to minimise the effects of expansion and contraction. Glass dishes may be nested provided they are either individually wrapped, or a sheet of paper is placed between each dish.

4. **Mirrors.** The silvering of mirrors is adversely affected by damp and precautions should be taken to prevent such deterioration.

5. **Metalware.** To be stored in accordance with Section 3 of this instruction.

6. **Plastic Articles.** To be stored in accordance with Section 4 of this instruction.

7. **Wood Ware.** Wood Ware (furniture, basketry, etc.) and wood more general, is to be kept in a dry and damp-free store. Wooden articles are unlikely to be affected by low temperatures, but should not be subjected to heat; equally sudden changes of temperature are to be avoided.

8. **Unpackaged Flat Wooden Articles.** Unpackaged flat wooden articles are to be stacked as follows:

a. **Polished Table Tops.** Blanket or felt pieces between each item to prevent damage and scratching. Paper, Wrapping, Waxed should be interposed between the blanket / felt and polished surfaces.

b. **Plastic or Linoleum Surfaced Table Tops.** Face to face without any separating material or air space.

9. **Polished and Upholstered Articles of Furniture.** Polished and upholstered articles of furniture are to be covered with a dust sheet.

10. **Brush ware.** Brushes and brooms are to be kept in a dry place and stored so that the hair, bristle or fibre is not bent or forced out of the normal position.

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Textiles

11. Textiles including leather items are to be stored in a dry, well ventilated, cool and shaded place, free from strong odours and away from the direct rays of the sun and strong light. No oils, greases or waxes should be allowed to come into contact with them and freezing temperatures are to be avoided as far as possible. With regards specific textile items the following is also relevant:

- a. Bedding in store is to be kept in a proper state of cleanliness and repair and fit for immediate use. Blankets, sheets, pillow cases and cushions should be enclosed in sealed polyethylene bags. As a precaution against attack by moth, all articles of bedding, other than those which are baled, are to be unfolded, exposed to the air and well shaken every six months, or more frequently if necessary. When returned to storage, folds are to be reversed. Woollen articles of bedding are to be protected against infestation.
- b. Baled bedding should be protected by over-wrapping and sealing, with suitable quantity of moth deterrent included where necessary.
- c. Interior sprung mattresses are to be stored vertically on edge to prevent distortion of their springs.
- d. Foam mattresses are to be stored on a flat surface either in stacks of not more than 12 high, or vertically on their long edge providing the weight is evenly spread and no pressure is exerted from the above. Care must be taken in the handling of mattresses, as splitting of the foam will occur if manhandled roughly or pierced by sharp instruments. There is no requirement to turn or rotate foam mattresses provided they are not stored in areas of excessively high Relative Humidity outside the UK. The practise of issuing oldest stock first is to be strictly adhered to.
- e. Textiles incorporated in furniture, such as cushions, are to be stored in a well ventilated area with appropriate protection included to prevent infestation.