TECHNICAL MANUAL

PROCEDURES FOR DESTRUCTION OF ELECTRONICS MATERIEL TO PREVENT ENEMY USE (ELECTRONICS COMMAND)

H E A D Q U A R T E R S D E P A R T M E N T O F T H E A R M Y
M A R C H 1 9 7 2

WARNING

CATHODE RAY TUBES: Cathode ray tubes (CRTs), such as radar display, storage, or television picture tubes can violently implode %hen cracked or broken The resulting explosion can propel glass fragments, electron "gun," or radioactive coating at high velocities Never stand close to and directly In front of a cathode ray tube being destroyed Stand % well clear and break the tube envelope using a thrown object or, preferably, small arms fire

ELECTROLYTES: The electrolyte used in nickel-cadmium batteries contains potassium hydroxide (KOH), which is a caustic chemical agent The electrolyte used in lead-acid batteries contains sulfuric acid (H2SO4), which is a corrosive chemical agent Serious flesh burns 1 ill result If either type of electrolyte comes in contact with any part of the body Before destroying cells or batteries, empty all electrolyte to prevent spattering when smashing

EXPLOSIVES: Personnel unfamiliar with explosives should not set or detonate explosive charges
FIRES: Toxic fumes may result from burning electronics equipment. Fires should be lit only in m open areas Avoid Inhaling fumes from burning circuit boards and components

LIVE ELECTRICAL EQUIPMENT: Disconnect before carrying out demolition

MECHANICAL EQUIPMENT: Before starting destruction of mechanical equipment used in conjunction with electronics, insure that high gas and hydraulic pressures in hoses. lines, and tanks, and tensions In large springs and associated mechanisms have been relieved

RADIOACTIVE ITEMS: Many electronic equipments contain radioactive material Do not begin destruction on such equipments without first removing the radioactive material Become thoroughly familiar with those publications, listed in the appendix, which pertain to radioactive items, prior to demolition and/or disposal of radioactive Items

WEAPONS FIRE: Personnel should stand well clear of an area used for demolition by weapons fire Always use a weapon of a caliber sufficient to insure enough penetration to achieve the desired damage, and eliminate the possibility of ricochet

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CHAPTER 1
INTRODUCTION

Section I. GENERAL

1-1. Scope
This manual is for the guidance of those whose duty it is to render inoperable or destroy equipment which is in imminent danger of capture by an enemy The instructions contained herein are in accordance with the requirement of all international agreements concerning destruction of equipment to prevent enemy use which were in effect on the date of this manual or any changes thereto

1-2. Authorization
Only divisional or higher commanders have the authority to order destruction of equipment They may, however, delegate this authority to subordinate commanders when the situation demands it

1-3. Reporting Destruction
Destruction of equipment will be reported through command channels

1-4. Reporting of Errors
The reporting of errors, omissions, and recommendations for improving this publication by the individual user is encouraged Reports should be submitted on DA Form 2028 (Recommended Changes to Publications), and forwarded direct to Commanding General, US Army Electronics Command ATTN AMSEL-MA-ML, Fort Monmouth, N J 07703

Section II. PRELIMINARY CONSIDERATIONS

1-5. General
This manual gives procedures on the demolition (destruction) of particular types of electronic components, subassemblies, equipments, and systems used by the Army It Is the responsibility of the personnel concerned to adapt the procedures contained herein to the destruction of specific electronic items in unique situations In all instances, the time available and the tactical situation will determine the number of equipments which can be destroyed, and the method of destruction

1-6. Demolition Plans
a Standing operating procedures (SOP's) for each using organization should incorporate a master demolition plan This plan should Include, but IS not limited to, the following

(1). Establish priorities for destruction among the various equipments

(2). Establish a priority for destruction on each equipment and ItS associated repair parts (para 1-12)

(3). List all practical methods of destruction applicable to each equipment, the tactical situations in which applicable, and any limitations

(4) List estimates of the time (in man-hours) necessary to destroy each equipment, using the one or more applicable demolition methods Multiply by the number of equipments assigned to determine total man-hours needed for complete destruction

(5) Assign personnel to specific destruction tasks, and specify the tools, supplies, or implements needed Assign alternative tasks in the event of absences of personnel

(6) List any and all safety hazards, and necessary precautions

b. Demolition plans are guidelines based on the ideal situation of unlimited time available, with all personnel and required tools and equipment on hand In less than ideal situations, appropriate departures from the demolition plans should be taken

1-7. Safety Considerations
During the demolition of an equipment, a safety hazard exists which is greater than that usually associated with the equipment during normal use To insure dafety during demolition, all personnel concerned should keep safety considerations in mind at all times Become familiar with the safety warnings on the inside cover and throughout this manual Also be aware of the safety warnings given in technical manuals on individual equipments

Section III. PRIORITIES FOR DESTRUCTION

1-8. General

a Classified Equipment and Documents .Priority must always be given to the destruction of classified equipment and associated documents

b Incomplete Destruction When lack of time and/ or stores prevents complete destruction of equipment, priority Is to be given to the destruction of essential parts, and the same parts are to be destroyed on all like equipment

c Repair Parts Destruction A guide to priorities for destruction of repair parts for various groups of equipment Is given in chapter 3

1-9. Equipment Installed in Vehicles

Equipment installed in vehicles should be destroyed in accordance pith the priorities for the equipment itself, taking into account the relative importance of the installed equipment and the vehicle itself

1-10. Repair Parts

The same priority for destruction of repair parts of a major item necessary to render that item inoperative must be given to the destruction of similar repair parts in storage areas

1-11. Cryptographic Equipment and Material

The detailed destruction procedure to be followed in order to insure the rapid and effective destruction of all types of crytographic equipment and material shall be that specified in instructions Issued by the appropriate communications security authority.

1-12. Priorities for Destruction of Parts of Military Technical Equipment (Electronic)

NOTE

The following list establishes priorities for equipments and major components Refer to demolition procedures, If any, given in technical manuals pertaining to individual equipments for supplementary information This information will aid in determining further priorities for component assemblies and subassemblies

Equpiment	Priority	Parts
RADIO	1	Transmitter (oscillators and frequency generators)
	2	.....Receiver
	3	.....Remote control units or switchboards (exchanges)and operating terminals
	4	.....Power supply and/or generator set.
	5	.....Antennas
	6	.....Tuning heads
RADAR AND OTHER ELECTROIC EQUIPMENT .	1	Frequency determining components records operating instructions which subject to security regulations, and identification material (Identification Friend or Foe (IFF))
	2	.....Antennas and associated components such as radiators reflectors and optics.
	3	.....Transmission lines and waveguides
	4	.....Transmitter high voltage components
	5	.....Control consoles, displays and plotting boards
	6	.....Cable system
	7	.....Automatic devices
	8	.....Other control panels and generators
	9	.....Carriage and tires
TELEPHONE AND TELETYPESN RITER EQUIPMENT .	1	Multiplexing equipment
	2	.....Relays and switching installations
	3	.....Printers and reperforators
	4	.....Cables, lines, and repeaters
	5	.....Telephone sets

Section IV. DEGREE OF DAMAGE

1-13. General

Choose methods and priorities of destruction which will cause such damage that it will be impossible to restore the equipment to a usable condition a within the combat zone by repair or by cannibalization

1-14. Classified Equipment

Classified equipment must be destroyed to such a degree as to prevent duplication by, or revealing means of operation or function to, the enemy

1-15. Associated Classified Documents

Any classified documents, notes, Instructions, mag netic or paper tape, or other written or visual records pertaining to function, operation, maintenance, or employment, Including drawings or parts lists, should be removed, if possible, from the equipment They must then be destroyed in a manner to render them useless to the enemy

CHAPTER 2
METHODS OF DESTRUCTION

2-1. General

The following methods of destruction may be uses separately or in combination, depending on the type of equipment The degree to which each method 1' used, and the order of application, should maximize damage to the equipment When several identica equipments are involved, give first priority to de stroying the same assembly, subassembly, or comm ponent on each unit A summary of destruction methods is given In table 2-1

WARNING

Poser should be removed from electrical and electronic equipment prior to demolition

WARNING

Before starting destruction of mechanical equipment used in conjunction with electronics, Insure that high gas and hydraulic pressures in hoses, lines, and tanks, and tension in large springs and associated mechanisms have been relieved

WARNING

Many electronics equipments contain radioactive material Do not begin destruction on such equipments l ithout first removing the radioactive material Become thoroughly familiar with those publications, listed in the appendix, which pertain to radioactive items

NOTE

In all instances, when time and conditions permit, inspect the equipment to insure that the destruction methods used were, In fact, effective

2-2. Self- Destruction Devices

Built-in self-destruction devices should be set off even if the major item containing equipment with self-destruction devices is to be destroyed These devices should be permitted to do their work at least partially before incendiaries or explosives (especially the latter) are set off, because an explosion might blow parts or classified documents to safety where enemy forces might find them

2-3. Improper Operation

The short circuiting of a power source and the application of an overvoltage to an equipment are examples of improper operation This method of destruction has a limited application to electronics material

2-4. Fire

The starting of fires on or near electronics equipment is particularly useful in destroying predominantly nonmetallic components, such as transistors. diodes, resistors, capacitors, switches, and printed circuit boards Fires should be lit after setting off explosives and/or completing mechanical destruction Fires within partially closed cabinets tend to be less effective than open fires, since a closed area does not allow sufficient oxygen necessary for an intense flame Heat sources which do not require an air supply, such as thermite-based devices or incendiary grenades, are not subject to this limitation The use of fire IS associated pith numerous hazards, including the possibility of disclosing positions which are under enemy visual or infrared surveillance

WARNING

Toxic fumes may result from buring electronics equipment Fires should be lit only in open areas Avoid inhaling fumes from burning circuit boards and components

NOTE

An explosion may prematurely put out a fire

2-5. Weapons Fire

The use of weapons fire is less desirable than mechanical destruction, and is practically useless against heavy gauge metal panels and metal castings However, optics such as night observation equipment is easily destroyed by correctly aimed gunfire

WARNING

Personnel should stand well clear of an area for demolition by weapons fire Always use a weapon of a caliber sufficient to Insure enough penetration to achieve the desired damage, and eliminate the possibility of ricochet

2-6. Demolition (Explosives) (FM 5-25)

Explosives refers to TNT, plastic explosives, and the like, as well as fragmentation grenades Explosives are most effective against structures and components

which will not burn, or are too heavy or too strong to be easily demolished by mechanical means The use of explosives has the disadvantage of possible disclosure of position when enemy forces are using sound-ranging-type equipment

WARNING

Personnel unfamiliar with explosives should not set nor detonate explosive charges

NOTE

The location of a demolition charge can make the difference between minor damage and complete destruction

2-7. Mechanical Destruction

Mechanical destruction includes smashing electronic components, bending chassis or subchassis, slashing cables and wiring, or any similar action Dropping a weight on an equipment and throwing a lightweight equipment over a cliff are also examples of mechanical destruction Sledges, hammers, axes, or heavy tools are examples of the implements which can be used Mechanical destruction should be completed before fires are lit

2-8. Use of Natural Surroundings

a The disposal or denial to the enemv of electronics material may be accomplished in the field by taking advantage of the surrounding topographv and environment

b Submergence of equipment and repair parts under water (lakes, ponds, streams, etc), concealment by hiding material in caves or, preferably, burial can be used effectively Where the surrounding area does not lend itself to such disposal, widely dispersed scattering of material, preferably, into heavy underbrush. can serve as a denial or delaying measure In the event the area is recaptured, effor^{+} should be made to recoup concealed items

Table 2-1. Summary of Destruction Methods for Electronics Materiel

Method	Typical tools or equipment required	Major application	Limitations	Safety considerations	Other comments
Improper operation Overloading(short use with circuiting)	Jumper wires for shorting fuses, terminals, etc	Power sources unprotected by fuses or circuit breakers	Small number of applications	Possible explosion of transformers, rectifiers etc, release of dangerous gases	Do not secondary (recharge-able) batteries
Excessive-voltage or current	Power supply giving higher than normal Current and/or voltage	Equipments unprotected by fuses or circuit breakers	Small number of applications	Possible explosion or unwanted burning of components, releasing gases harmful to personnel	
Fire	Gasoline, kerosene. diesel fuel incendiary gre nades flame-throwers, or thermite devices	Solid state devices, resistors, capacitors, switches printed circuit cards, and wiring,	Less effective against metal cabinets, structural members etc ,	All safety precautions relative to fires are applicable during demolition -	Closed area prevents sufficient oxygen from reaching flame, resulting in poor combustion Destruction by fire should follow explosive and mechanical demolition
Weapons fire	Any rifle, machine gun, bazooka, or other weapon accurately aimed	All types of elecltronic equipment, particularly op-	In most instances less effective than mechanical de-	Possible ricochet and flying frag ments	Areas in which weapons fire demolition is carried outshould be cleared of personnel Weapon used should be of a caliber high enough to insure missile penetration
Demolition (explosive, or fragmentation grenades	Any military high - explosive	Heavy, rigid, or solid parts of electronics material, such as structural members, framework, or cabinets	High explosives, and the time needed to properly place cx plosive charges and assemble a firing system may not be available	Severe injury and death may occur when explosives are used by unqualified personnel	The location of an explosives) charge can make the difference between minor amage and complete - destruction
Mechanical destruction (including smashing, bend slashing)	Sledges, hammers axes, handaxes ming, cutting, or rocks, stones, machettes, heavy wrenches and similar handtools crowbars, cutting torch, etc	Nearly any electronic compo nent or equip ment, particularls nonnflam mable components -	Less effective than fire against small predominantly nonmetallic com ponents such as solid state de vices, resistors capacitors, switches, and wiring	Danger from live electrical cir cuits, release of nuclear radiation and flying frag-ments	Mechanical destruction should gen erally precede fire or explosrve demolition
Use of natural surroundings (in cluding submergence, burial, concealment, or scattering)	Shovels, spades, hoes, or other type of digging equipment	Small and/or easily disassem - bled equipments Small subassem blies, printed circiut cards, or components	In most instances destruction will be incomplete	None	If area is recaptured, items may be retrieved -

CHAPTER 3
SPECIAL INSTRUCTIONS FOR ELECTRONIC COMPONENTS

3-1. General

Individual electronic components should be destroyed whenever time permits The destruction of a complete equipment takes priority over destruction of common electronic repair parts or components If the part Is specially made for one particular type of equipment, it should receive equal priority with the equipment for which it is Intended

3-2. Destruction Procedures for Electronic Components and Subassemblies

Individual components are listed below in alphabetical order The basic method of destruction, such as smashing or burning Is given first, followed by the implement or materials used, given in parentheses In many instances, component size will determine the most appropriate means of destruction

WARNING

Cathode ray tubes (CRT's), such as radar display, storage, or television picture tubes can violently implode often cracked or broken The resulting explosion can propel glass fragments, electron "gun," or radioactive coating at high velocities Never stand close to and directly in front of a cathode ray tube being destroyed Stand *ell clear and break the tube envelope, using a thrown object or, preferably, small arms fire

CAUTION

Many special purpose electron tubes contain radioactive material Such tubes must be Identified and disposed of in accordance with proper procedures (See TB 750-237)

Component	*Method (Typical Implement or Materials Used)*	*Safety Considerations*
Cabinets	Smash, bend (sledge, axe, crowbar)	
Cables (including wiring)	Cut (axe, shears or similar implement) followed by burning (gasoline, flamethrower)	
Capacitors	Bury or scatter	
Cells, primary (nonrechargeable), such as flashlight cells etc	Smash (sledge, axe), or burn or scatter	Release of toxic chemicals
Cells, secondary (rechargeable), alkaline (such as nickel-cadmium or silver-zinc)	Empty electrolyte and smash (sledge, axe)	Probable spattering of electrolyte If not previously emptied from cells
Circuit breakers	Smash, bend (sledge, axe, crowbar), followed by burning (gasoline, flamethrower), or scattering	Flying fragments from larger units
Connectors (including terminal strips)	Smash (sledge, axe) followed by burning (gasoline, flamethrower)	Flying fragments
Crystals	Smash (sledge), or bury or scatter	Flying fragments
Electron tubes		
a Small receiving type	Smash (sledge), or bury or scatter	Flying fragments
b Special purpose (including cathode ray tubes)	Smash (sledge, axe) Do not smash CRT's at close range Stand clear and hurl a rock or use small arms fire	Flying fragments Possible danger from cathode ray tubes due to high vacuum and phosphor coating on screen Release of nuclear radiation
c Transmitting (high power)	Smash, bend (sledge, axe)	Flying fragments
Fuses	Smash (sledge), or bury or scatter	

Component	*Method (Typical Implement or Materials Used)*	*Safety Considerations*
Headsets.....	Smash (sledge), cut cables (axe, shears, or similar implement), followed by burning(gasoline, incendiary grenades)	Flying fragments
Lamps, indicator.....	Bury or scatter	
Loudspeakers.....	Break out cone, bend frame (sledge, axe)	
Meters.....	Smash (sledge), particularly in such a as to jam meter movement	Flying fragments
Microphones	Smash (sledge)	Flying fragments
Motors (including fans and ..... blowers)	Smash (sledge) and/or bend (crowbar or similar device giving leverage) Cut (axe, etc) cables Fractional type motors may be dropped in such a way as to bend shaft, preventing rotation Apply voltage (or over-voltage) in a stalled condition Using jumper leads, bypass fuses and/or cutout deices	Flying fragments Danger from high voltage on installed units
Relays.....	Smash (sledge) followed by burn-ing, or burn or scatter Apply overvoltage to coil	Flying fragments from larger units
Resistors.....	Bury or scatter	
Screw s, washers, miscellaneous .... small parts	Scatter	
Solid state devices.....	Smash (sledge) and/or burn (gasoline, flamethrower), or bury or scatter	
Switches	Smash (sledge)	Flying fragments from larger units
Tools.....	Smash (sledge), or bury or scatter	
Transformers.....	Bury or scatter smaller units Apply normal or higher voltage to one winding while shorting out other(s) Operate from high current dc source	Possible explosion u hen applying overload to larger units

CHAPTER 4
SPECIAL INSTRUCTIONS FOR ELECTRONICS EQUIPMENT (GENERAL)

4-1. General

This chapter provides basic guidelines for the destiuction of electronics equipment which cannot be categorized This general category includes all types of radios, radars, test sets, data systems, general test equipment, and other miscellaneous equipments Ho ever, telephone and teletypewsriter equipmnert (including exchanges and operating terminals), antennas, optics, supporting structures, shelters, batteries, and motor generators have been categorized in separate chapters

NOTE

Smashing of external cabinets and panels can bind them, preventing dismantling of the equipment for further demolition Always disassemble the equipment, if necessary, before proceeding with demolition

4-2. Equipment of Metal Chassis Subchassis-Type Construction

a *Type of Construction* Demolition methods are more or less effective, depending on the equipment construction size, and material composition One type of electronic equipment construction uses a metal chassis and/or several subchassis with point-to-point wiring Components such as tubes, transformers, and electrolytic capacitors are mounted on the chassis Wiring and smaller components, such as resistors and capacitors, occup3 the Inside or underside of the chassis It is usual with military equipment to parallel several wires and bind them together to form a wiring harness The chassis or subchassis may be inclosed in a cabinet, but for rack mounting the equipment may only have a front panel In many instances, subchassis or rackmount units will be provided with one or more connectors which allow quick disconnection and removal This quick-disconnect feature is also used on rack-mount equipments which are designed to slide out like a drawer

b. Method of Demolition. The most effective method of destroying chassis/subchassis type equipment is by smashing or bending, using a sledge or an axe Cables and wiring harnesses may be cut, using an axe or similar implement When destroying interconnecting cables, first cut the cables as close as possible to the connectors, then cut the remaining cable repeatedly Try to dispose of the connectors in an area widely separated from the disposal area of the cut cable sections Smaller components still intact in the equipment may be destroyed by fire from gasoline, kerosene, diesel or other oil, flamethrower, or Incendiary grenade When using fire, remember that enough open space must be provided throughout the equipment to allow the necessary air circulation for an intense flame A quick alternative method is the use of Intense heat generating devices of the thermite type This method may be used without removing subassemblies from the main equipment The extreme heat generated is capable of either melting or greatly distorting most thin-wall cabinets and light structural members Rack-mount equipments are particularly vulnerable to demolition when open at the back, or when removed from the protective rack or cabinet Destruction of equipment using subchassis type construction may be easier if the subchassis are removed and then smashed and burned separately Time available will strongly determine if and when this approach can be used Several rounds of properly aimed weapons fire, or a sufficient amount of explosives, are effective means of demolishing larger installations of chassis/subchassis type electronic equipments

4-3. Equipment of Printed Circuit Card/Rack-Type Construction

a *Type of Construction*. Equipments using solid state devices, such as transistors and diodes, usually use printed circuits Components are located on one side of the circuit board or card, while the connections are made by a metal coating, forming the circuit, on the opposite side The circuit board may be attached to a chassis and connections made by soldering wires to appropriate points on the board A technique which eases maintenance of electronic equipment uses a circuit card in which desired connections to the equipment are made paralleling the printed circuit forming a broad short tab which may be mated to a specially designed connector This design makes the circuit board removable

b *Method of Demolition*. If time permits, individual printed circuit cards may be removed and broken or smashed If a fire has been started in conjunction with demolition of other Items, the circuit boards may be thrown onto the fire Precautions should be taken against the possible release of toxic fumes from the burning boards and/or components Circuit boards may also be scattered, thrown

into nearby lakes, streams, or rivers, buried, or hidden If the remaining part of an equipment from %circuit cards have been removed is predominantly metallic, only mechanical destruction methods need by used If there is insufficient time to remove Circuit cards, the equipment should be mechanically demolished, using an axe or a sledge, followed by burning with gasoline, flamethroaer. or incendiary grenade Larger Installations of equipment may be readily destroyed by placing explosives, or using large weapons fire

CHAPTER 5
SPECIAL INSTRUCTIONS FOR TELEPHONE AND TELETYPEWRITER EQUIPMENT

5-1. Telephone Sets

Small equipments such as field telephone sets should be destroyed by removing ant cover or protective housing, and smashing with sledge or axe, followed by burning with gasoline, flamethrower, or Incendiary grenade

5-2. Large Telephone and Teletypewriter Installations

Methods for the destruction of telephone and teletypewriter equipment differ from those applicable to many other equipments, due to the predominance of mechanical equipment and components such as relays and switching units

5-3. Destruction Methods for Telephone Installations

a Telephone installations may consist of manual switchboards or dial central offices containing large numbers of X-Y (crossbar) or tandem (step-by-step) switching units Mechanical destruction methods, such as smashing or bending with a sledge or crowbar, are effective against telephone switching equipment, particularly when these methods bend moving contacts out of alignment Wiring and cable may be cut using an axe, and then burned using gasoline, diesel oil, or flamethrower Fires on or around switching Itching equipment may have a very limited effect,
due to the predominance of metal parts in relays, stepping switches, jack fields, and the like

b Demolition of telephone installations by incendiary or fragmentation grenade is also an effective method, particularly when time is very limited Demolition by weapons fire, particularly small arms fire, is much less effective Explosives can demolish telephone switching equipment with less expenditure of physical effort than mechanical methods

5-4. Destruction Methods for Teletypewriter Installations

Destruction procedures for teletype central office-type installations ll] be similar to those for telephone dial central equipment Because teletypewriters contain many mechanical moving parts, they are highly susceptible to mechanical damage Teletvperiters are readily destroyed by removing covers and housing, and smashing or bending the mechanism with an axe or a sledge in such a way as to jam the mechanism Large installations of relays and switching equipment should be demolished In the same manner as is used for telephone equipment (para 5-3) Methods used will also be subject to the same limitations

CHAPTER 6
SPECIAL INSTRUCTIONS FOR ANTENNAS, SUPPORTING STRUCTURES, OPTICS AND SHELTERS

6-1. Antennas and Supporting Structures

a. Antennas take a wide variety of shapes and sizes. and destruction methods ill accordingly Antennas may he broadly classified into categories those which operate from two-wire-balanced or coaxial transmission lines (such as dipole and long-wire type), and those which usually operate from waxeguides, but may use coaxial cable (such as horn type) The most effective destruction Is the mechanical method Due to high metal content In antennas, fire will tend to ha e little effect

b. Wire-type antennas used in conjunction with field radio installations are most easily destroyed by mechanical means, particularly cutting Items such as baluns or insulators may be effectively destroyed by small arms fire After taking the antenna down, it may be cut into short sections

c Dipole array-type antennas such as Yagi or log-periodic are easily destroyed by cutting the elements, using an axe or a similar tool Antennas may be knocked over by placing demolition (cutting) charges, by directing large weapons fire, or by pushing at the base of a tower or mast, or pulling with rope or cable, using a tank or heavy truck

d Destruction methods for horn and parabolic antennas will vary in accordance with their size Smaller antennas should be bent out of shape, using an axe or a sledge On small parabolic antennas, knock off the feed horn with a sledge or similar implement Bend any and all waveguide sections, using an axe, crowbar, or sledge Waveguide-type plumbing, which is usually made of a material with a relatively low melting point, can be destroyed by intense heat devices, such as thermite Smash any lens assembly attached to horns Parabolic antennas of tubular construction which are too large and heavy for destruction by hand Implements should be destroyed by explosives or large capons fire

e Antenna towers and masts are most readily destroyed by explosives. Demolition charges may be placed at the base of a self-supporting toner On guyed towers. the gut wires may be cut by conventional tools, or plastic explosives molded around the wires to form a cutting charge Downed masts or towers may be further damaged by placing several steel cutting demolition charges or by applying a (cutting) torch at several equally spaced points along the tower

6-2. Optics

A special characteristic of optical equipment such as night vision sights, starlight scopes, light signaling equipment and the like, is its susceptability small arms fire Lenses and mirrors, along with image converter and intensifier tubes, can be demolished by firing ten or more rounds equally spaced along the length of the device A fragmentation grenade placed near the center of the equipment is another method of destroying optical devices In all instances, image converter or intensifier tubes should be destroyed first

6-3. Shelters

Shelters often contain many pieces of electronic equipment intended to function together in a so stem Such installations are especially vulnerable to damage by demolition charges placed inside the shelter Using this demolition method, it is not necessary to remove and demolish each equipment, although destruction ill1 be more complete if explosives are preceded by mechanical demolition Fire from large weapons Is another effective method of destroying shelters.

CHAPTER 7
SPECIAL INSTRUCTIONS FOR SECONDARY (STORAGE) BATTERIES AND MOTOR GENERATORS

7-1. Secondary (Storage) Batteries

a. A secondary or storage battery is a group of cells, usually wired in series, which is rechargeable an appreciable number of times The two types of storage batteries of interest are the lead-acid and the alkaline (such as nickel-cadmium or silver-zinc) A safety hazard of spattering electrolyte containing strong acid or caustic exists when destroying either type of battery Serious flesh burns can result if electrolyte is allowed to come into contact with the skin To avoid spattering while destroying secondary batteries, always remove the filler (vent) caps, and invert the battery, letting the electrolyte out

b Both types of storage battery are most readily destroyed by smashing with an axe or sledge Alkaline batteries, such as nickel-cadmium or silver-zinc, consist of a battery box containing removable cells To increase damage to the battery, individual cells may be disconnected, removed, and smashed with an axe or sledge Battery box liners and gaskets may then be removed and burned Time available will strongly determine if this approach may be used Protective clothing (rubber gloves, goggles, and apron), if available, should be worn to protect personnel during battery demolition

7-2. Motor Generators

a Motor generators are typically very rugged, consisting of thick metal housings, shafting, and heavy rotor (armature) and stator (field) windings Placing of demolition blocks under and around the unit is the surest means of demolition Fire will tend to have little effect on a motor generator, other than burning some of the insulation on exposed windings and leads Mechanical destruction with hand implements such as an axe or sledge has a limited effect due to the heavy construction of most units

b The most vulnerable part of a motor generator is the electronic regulator which is usually Installed atop the main unit It can be demolished using the same methods as are used for electronics equipment in general, that is, smashing with an axe or sledge, followed by burning with gasoline, flamethrower, or incendiary grenade

c The technique of destruction by improper operation can be applied to motor generators Short out the generator section, while bypassing any fuses, circuit breakers, or thermal cutouts This method can be used only when there is sufficient time

APPENDIX
REFERENCES

AR 310-50	Authorized Abbreviations and Brevity Codes
AR 385-40	Accident Reporting and Records
AR 700-52	Licensing and Control of Sources of Ionizing Radiation
AR 700-64	Radioactive Commodities in the DOD Supply System
AR 755-15	Disposal of Unwanted Radioactive Material
DA Pam 310-4	Index of Technical Manuals, Technical Bulletins, Supply Manuals (Types 7, 8, and 9), Supply Bulletins, and Lubrication Orders
FM 5-25	Explosives and Demolitions
TB 750-237	Identification of Radioactive Items in the Army Supply System
TM 3-261	Handling and Disposal of Unwanted Radioactive Materials
TM 38-750	The Army Maintenance Management System (TAMMS)
TM 9-1375-200	Demolition Materials

By Order of the Secretary of the Army

W.C. WESTMORELAND,
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SVAD (5)
Gen Dep (2)
Sig Sec, Gen Dep (5)
Sig Dep (10)

MDW (1
Armies (2)
Corps (2)
Dlv (2)
Regt (2)
Bde(2)
Bn (1)
Co/ btrn (1)
Instl i 2) except
Ft Gordon (10)
Ft Huachuca (10)

ATS(1)
MAAG (1)
WRAMC(1)
USARMIS (1)
USAERDAA (2)
USAERDAW(5)
USACRREL (2)
Sig FLDMS (2)
Units org under fol TOE
11-500(AA-AC) (I)

ARNG State AG(3)
USAR None
For explanation of abbreviations used, see AR 310-50

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TEAR ALONG PERFORATED LINE

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

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