

SECTION I

INTRODUCTION

1-1. GENERAL.

1-2. This publication provides field maintenance instructions, with overhaul, for the Aircraft Machine Gun Module, 7.62-mm, Air Force Model MXU-470/A, shown in figure 1-1.

Note

The Aircraft Machine Gun Module will be referred to as the gun module throughout this publication.

1-3. PURPOSE AND FUNCTIONAL DESCRIPTION.

1-4. The gun module is designed as a fixed installation in an aircraft for air to ground firing missions. It consists of a GAU-2B/A, 7.62-mm aircraft machine gun, linkless ammunition storage and feed system, battery power supply, electrical control package and stand. In operation, the battery power supply provides operating voltage for the electric drive assembly to drive the gun and the feed system which supplies ammunition to the gun. The gun module is operated from a remote location.

1-5. PHYSICAL DESCRIPTION.

1-6. GENERAL.

1-7. Figure 1-2 shows the general arrangement of the components that comprise the gun module. The following paragraphs provide a description of these components.

1-8. GAU-2B/A, 7.62-MM AIRCRAFT MACHINE GUN.

1-9. The gun (figure 1-3) is a standard GAU-2B/A weapon which is mounted to the upper cover by two recoil adapters and a rear mount. The recoil adapters are secured to the cover by two quick-release pins. A loading sector is provided to be installed in place of the safing sector to prevent damaging the gun bolts when the gun is rotated opposite to the firing direction during loading of the gun module. Refer to T.O. 11W1-13-5-2 for detailed information pertaining to the gun.

1-10. ELECTRIC DRIVE ASSEMBLY, MAU-100/B.

1-11. The electric drive assembly (figure 1-4) is secured to the gun with three bolts and consists of an electric motor, a drive housing and gear assembly. The gun drive assembly meshes with the gear on the gun rotor and drives the gun when the trigger signal

is applied. Electrical connection to the control assembly is made through J9 on the motor housing.

1-12. FEEDER ASSEMBLY.

1-13. The feeder assembly (figure 1-5) is attached to the gun housing by two quick-release pins. It consists of a housing, feeder gear, shaft, sprocket, inner guide, solenoid and a clearing mechanism. The feeder gear and sprocket are located on the shaft and are pinned in position. Clearing guides are mounted on the clearing shaft and are secured in position by pins. The solenoid is connected to the clearing mechanism by a link. When the trigger signal is applied, the solenoid is energized and moves the clearing guides into the firing position thus permitting rounds to be transferred into the gun. When firing is terminated, the solenoid is deenergized, the clearing guides return to the clearing position and interrupt the flow of ammunition to the gun so that the gun will be clear of rounds when it comes to rest.

1-14. STORAGE DRUM ASSEMBLY, MAU-81/A. (See figure 1-2.)

1-15. COVERS. The upper and lower covers are cast aluminum structures secured to the drum by hex-head bolts. The upper cover provides mounting for the gun, delinking loader, rounds counter assembly and the exit shaft which transfers ammunition from the drum to the feeder during firing and from the delinking loader to the drum during loading. A hex is machined on the end of the exit shaft for attachment of a hand crank if loading is to be performed manually. A flexible case ejection chute is attached to the upper cover to convey the spent cases and cleared rounds to a storage container.

1-16. The rounds counter assembly and bracket are mounted at the rear of the drum cover. The assembly is driven by a counter gear on the exit shaft. The counter records the cumulative total of rounds cycled through the gun module (TOTAL ROUNDS ON MODULE) and a total of the rounds remaining in the module (ROUNDS IN MODULE). The number of rounds in the drum is automatically set into the counter when the drum is being loaded. A switch in the counter (full drum switch) will automatically stop the power loading operation when the drum is full of ammunition. Another switch in the counter (last rounds switch) will terminate firing when the drum is empty.

1-17. Located at the rear of the upper cover is the loader link switch assembly which contains two switches. The switches are actuated by the loader detent pin to prevent the gun from being fired when

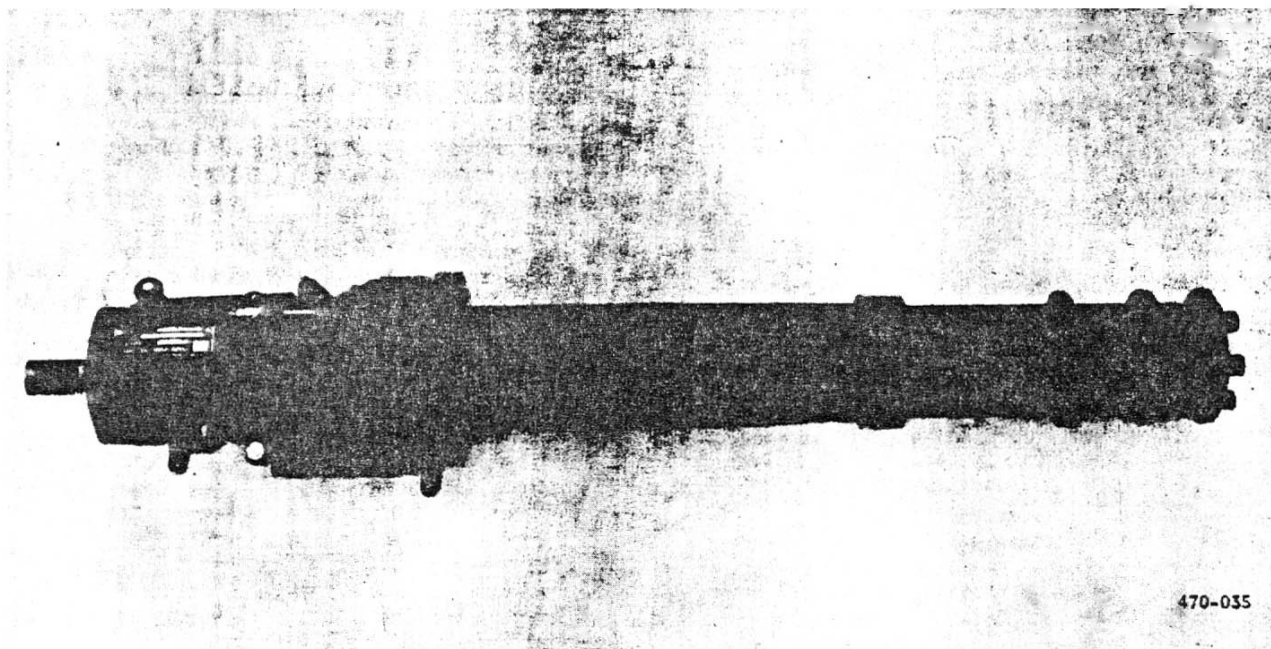


Figure 1-3. GAU-2B/A, 7.62-mm Aircraft Machine Gun

the loader is not in the fire position and to permit power loading to be accomplished when the loader is in the load position.

1-13. The lower cover acts as the mounting point between the module stand and the remainder of the gun module. The lower cover is held in the stand by three adjusting balls which mate with sockets located in the mounting fittings on the stand. The right-front ball provides for azimuth adjustment and the rear ball for elevation adjustment. Added rigidity is provided by a base support located on each side of the drum.

1-19. DRUM. The drum consists of a stationary outer drum and a rotating inner drum. The outer drum mounts a helix which by rotation of the inner drum moves the rounds vertically (up during firing - down during loading) in the partitions of the inner drum. The outer drum contains two brackets which mount the control assembly and the battery assembly. Also mounted to the outer drum is a chute for conveying links to a container after they are stripped from the ammunition during loading.

1-20. CONTROL ASSEMBLY DCU-122/B.

1-21. The control assembly (figure 1-6) is mounted to a bracket on the outer drum and is secured in place by four turn-lock fasteners. The control assembly contains the circuitry necessary for operating the gun module (firing, gun clearing, battery charging and power loading). Interconnection between the electrical components of the gun module and remotely located firing controls is made by cables which attach to connectors J2, J3 and J4 on the rear of the assembly. Also located on the rear of the assembly is connector J1 which supplies power to a lamp. A panel on the front of the assembly contains the power loading

control, safing switch and the battery charging control indicators and test points. Access to the circuits and components is gained by removing the side cover which is held in place by six turn-lock fasteners. The side cover contains clips for stowing the loading sector, safing bar and hand crank.

1-22. BATTERY ASSEMBLY MAU-101/B.

1-23. The battery assembly (figure 1-7) is mounted to a bracket below the control assembly and is secured to the bracket by four turn-lock fasteners. The assembly contains 22 nickel-cadmium cells which are interconnected to form two separate and equal power sources. Thermostats which control heating elements within the walls of the assembly maintain the temperature above that which will reduce the efficiency of the cells. An electrical connector (J5) on the outside of the assembly interconnects the battery with the switching circuits in the control assembly. Access to the cells and thermostats, is gained by removing the cover which is held in place by four turn-lock fasteners. The battery is recharged by power supplied from the aircraft.

1-24. DELINKING LOADER MAU-82/A.

1-25. The delinking loader (figure 1-8) is mounted to the upper cover and secured in position by a quick-release pin and a pivoting link. A spring-loaded defent pin, located at the rear of the housing, engages one of two holes in the pivoting link to secure the loader in the fire or load position. The loader must be secured in the firing position to fire the gun. When in the loading position, the self-timing gear on the loader engages the self-timing gear on the drum exit shaft and is driven by the exit shaft. The loader removes the rounds from the links, feeds them to

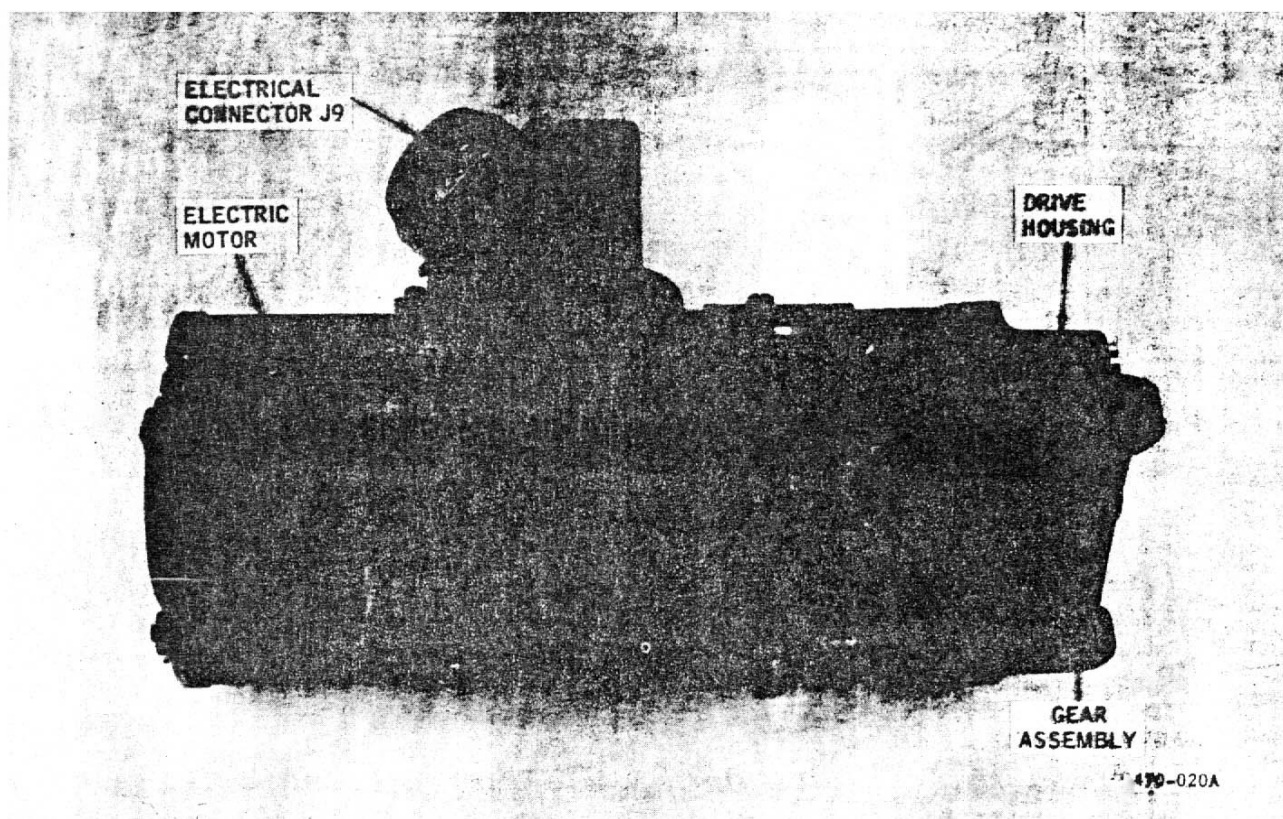


Figure 1-4. Electric Drive Assembly MAU-100/B

the exit sprocket on cover and ejects the links into the link ejection chute. An instruction plate located above the loader entrance chute illustrates the correct ammunition belt orientation for loading.

1-26. MODULE STAND.

1-27. The module stand (figure 1-9) consists of a base plate, frame assembly, two top mounting fittings, a side mounting fitting and an elevation indicator. The fittings are bolted to the frame assembly and are positively located by two pins in each fitting. The frame assembly is bolted to the base plate. The adjusting balls on the lower drum cover are engaged with the sockets in the mounting fittings to provide movement for boresighting the gun module.

1-28. LOADING SECTOR.

1-29. The loading sector (figure 1-10) is stowed on clips riveted to the control assembly cover (shown in figure 1-2) and is used in place of the safing sector on the gun during the loading operation. The loading sector is fastened to the gun by the same quick-release pins that secure the safing sector.

1-30. HAND CRANK.

1-31. The hand crank (figure 1-10) is stowed on clips riveted to the control assembly cover (shown in

figure 1-2) and is used to rotate the module components for loading ammunition into the drum and cover assembly in the event that power loading cannot be accomplished. The hand crank is inserted over the end of the exit shaft and engages a pin on the shaft. The hand crank is designed to mate with the pin and rotate the components in the loading direction only.

1-32. SAFING BAR.

1-33. The safing bar (figure 1-10) is stowed on clips riveted to the control assembly cover (shown in figure 1-2) and is used to prevent the gun from rotating and thus firing when the module is loaded and not ready for use. The long arm of the bar is inserted between the gun barrels and down through the center hole in the drum cover. To facilitate maintenance in areas where tools are not available, the safing bar is equipped with a 7/16-inch socket wrench on one end and screwdriver shaped end on the other. Removal and disassembly of all the module components can be performed with the safing bar if no tools are available.

1-34. PHYSICAL AND ELECTRICAL CHARACTERISTICS.

1-35. The physical and electrical characteristics of the gun module are given in table 1-1.

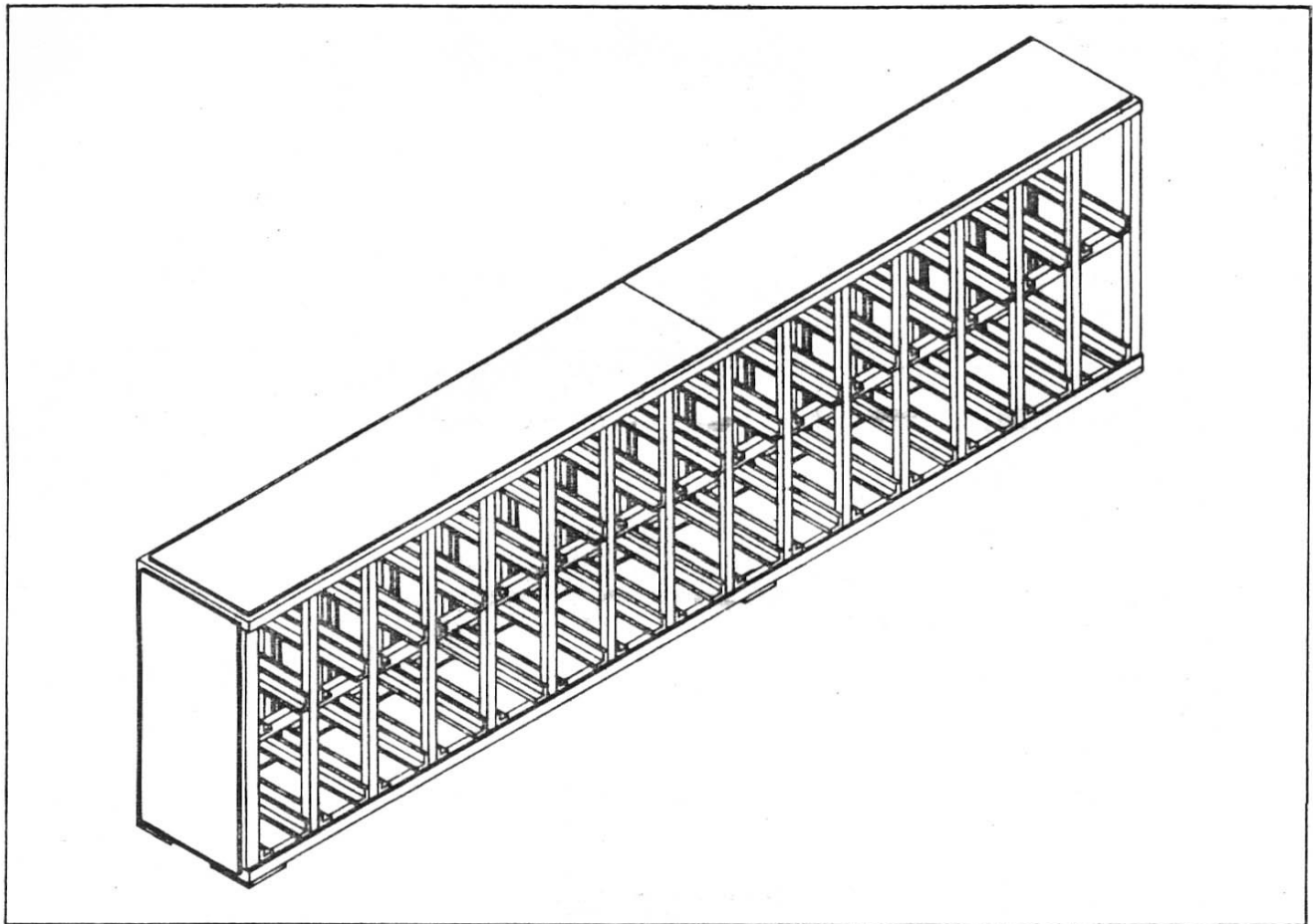


Figure 3-33. Ammunition Storage Rack

jected through collimating lenses and reflected off of the combining glass. A fixed reticle reference is a 50 mil and 100 mil radii semi-circular image calibrated to the position where the nominally harmonized gun projectiles impact on the target. The fixed reticle is used on purely visual attacks when not utilizing any of the available target location sensing devices which input data to the fire control system computer for lead angle computation. A movable reticle reference is 25 mil and 50 mil diameter circular image of collimated light whose position in azimuth and elevation (lead angle) is controlled by the output of the fire control computer. By maintaining an aircraft heading that keeps the two reticle images superimposed the pilot knows he is tracking the target. Target position input data is supplied to the computer from the night observation device (NOD). The daylight optical scope on the NOD and/or manual inputs of bearing and distance offsets from an identifiable signal and/or light being observed by a sensor. The movable reticle may be set manually (in elevation only) for the air to ground attack conditions differing from those specified for the fixed reticle position. Under data input conditions the pilot tracks the target with the elevation displaced movable reticle. In addition, the high intensity XENON arc lamp illumination system provides area or spot illumination to enhance visual sight or NOD visual identification of a ground point or target.

3-9-52. REMOVAL.

- a. Assure that all switches on the fire/sight mode selector panel are OFF.
- b. Disconnect electrical connector from gunsight.
- c. Remove four nuts, washers, and bolts securing gunsight to stand assembly; remove gunsight.
- d. Gain access through nose wheel well and remove four nuts, and washers securing gunsight stand assembly to crew compartment floor; remove four bolts from stand assembly inside crew compartment.
- e. Remove gunsight stand assembly.

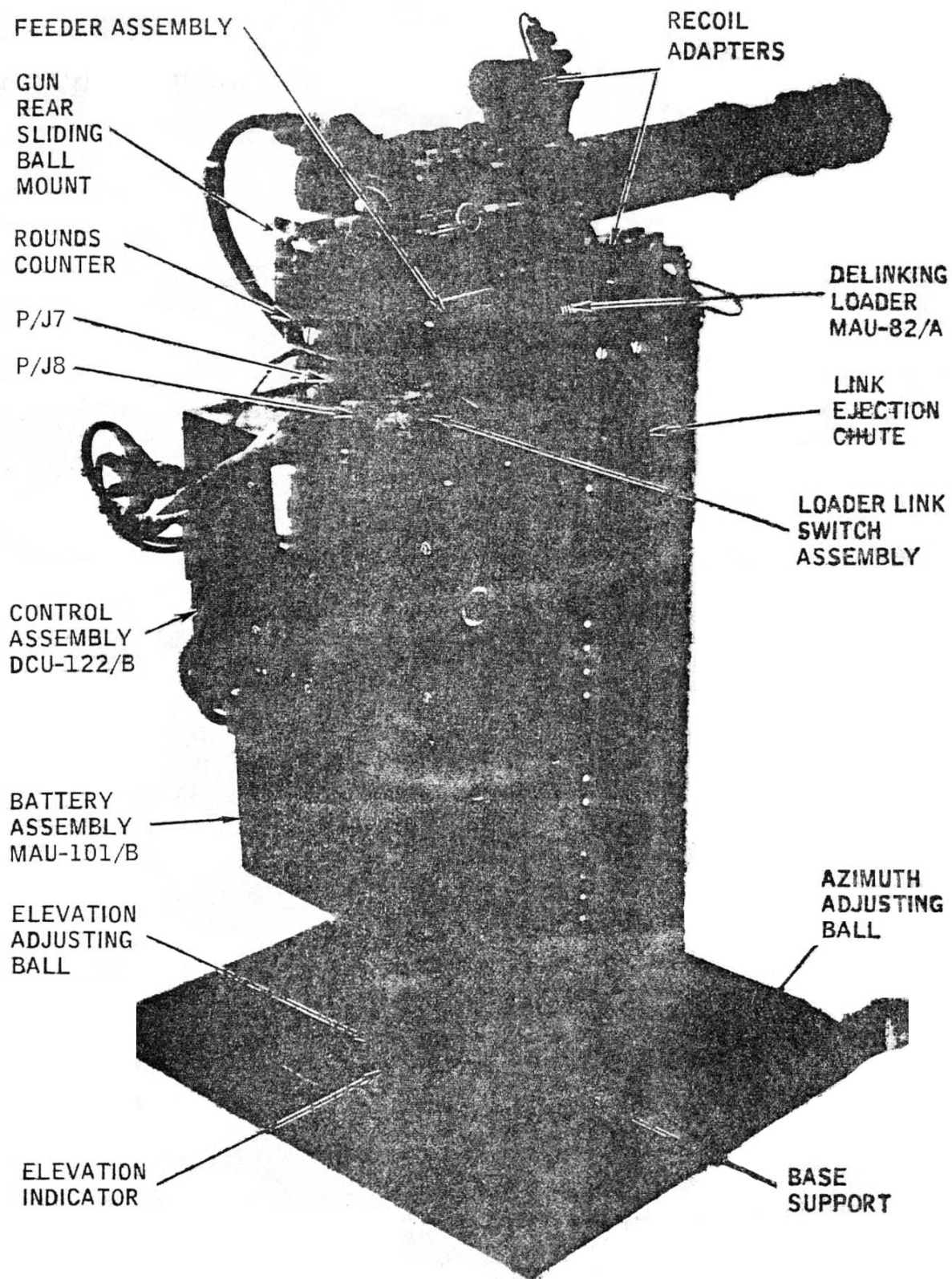
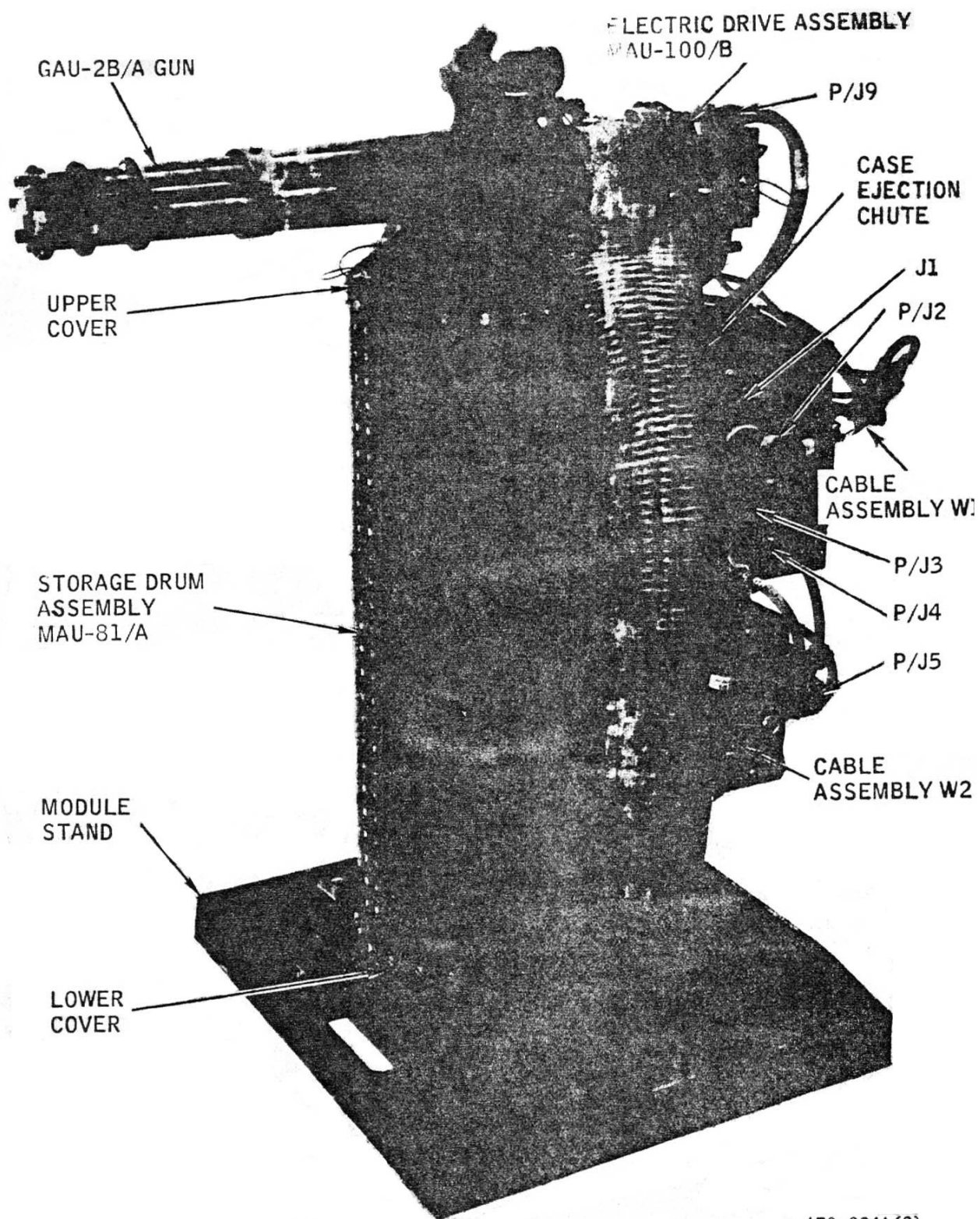
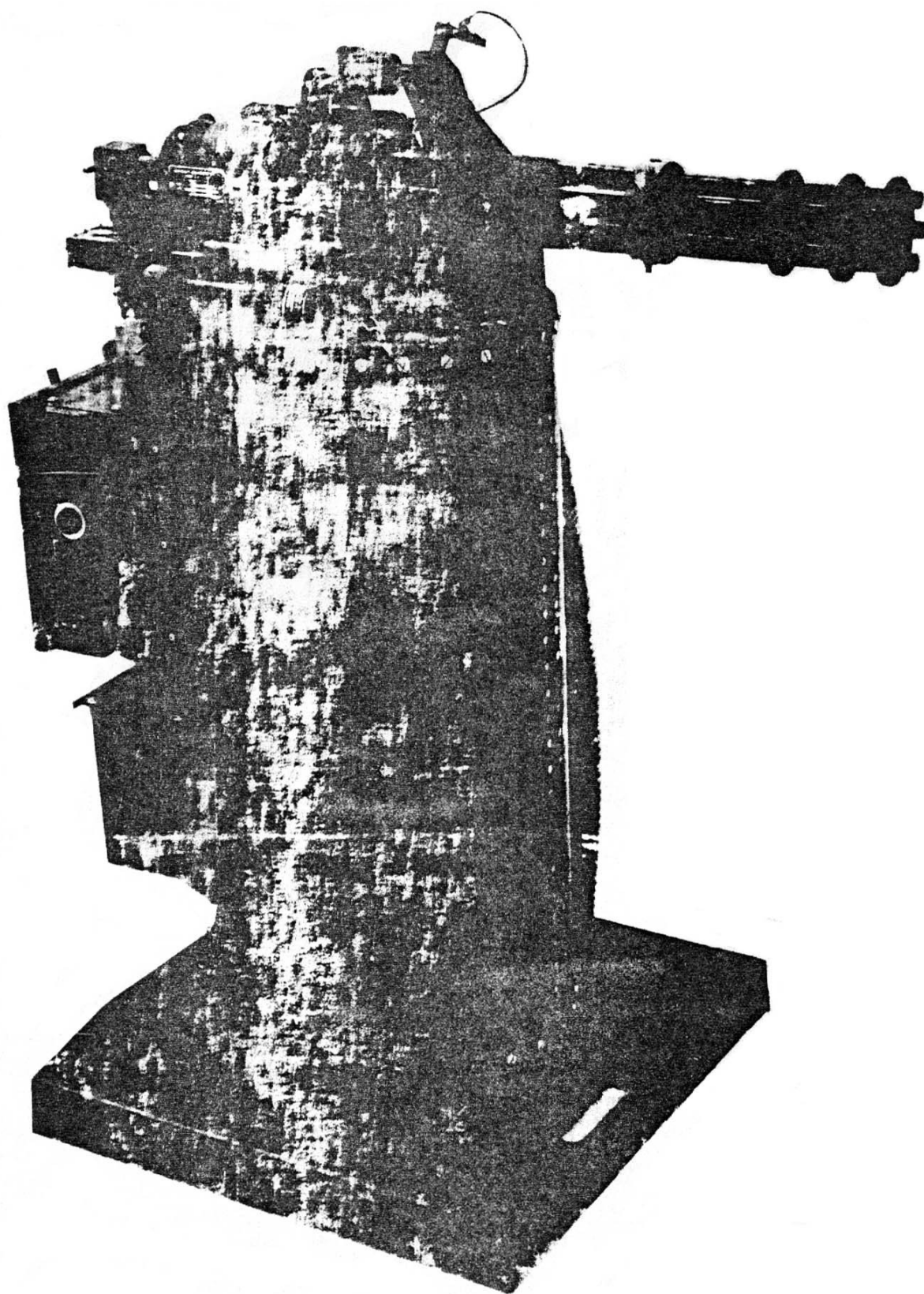


Figure 1-2. Gun Module, Location of Components (Sheet 1 of 2)



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Figure 1-2. Gun Module, Location of Components (Sheet 2 of 2)



470-021A

Figure 1-1. Aircraft Machine Gun Module, 7.62-mm, Air Force Model MXU-470/A

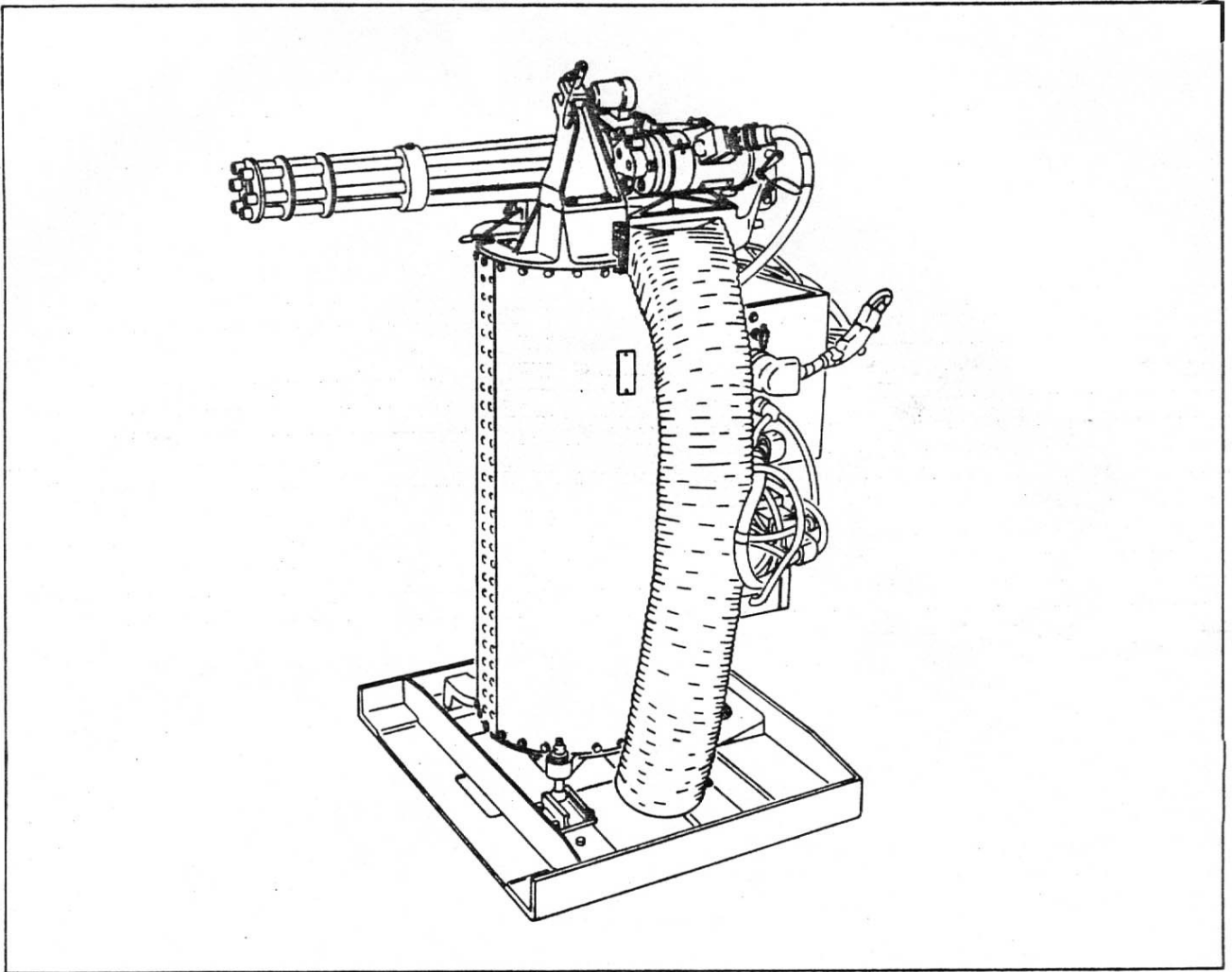


Figure 3-31. MXU-470/A Gun Module

3-9-41. INSTALLATION.

- a. Place platform in position on mounting studs.
- b. Secure with six washers and self-locking nuts.

3-9-42. GUN STATION RAM AIR COOLING.

3-9-43. **DESCRIPTION.** The gun station ram air cooling system provides a continuous flow of outside air to the four gun stations. The system consists of four ram air scoops attached to the left side of the fuselage which direct ram air through cooling tubes to the gun stations.

3-9-44. AMMUNITION STORAGE RACK.

3-9-45. **DESCRIPTION.** The ammunition storage rack for 7.62MM ammunition is installed along the right side of the cargo floor between fuselage stations 319 and 479 approximately. The rack is capable of storing 30 containers of 1500 rounds of 7.62MM belted ammunition. Each container is supported and restrained, during the course of the mission, yet they are readily removed from the rack during periods of reloading. A total of 50,000 rounds of 7.62 MM ammunition is carried (8000 rounds per four guns and 42,000 rounds in 28 containers). Two containers will be left empty in the storage rack.

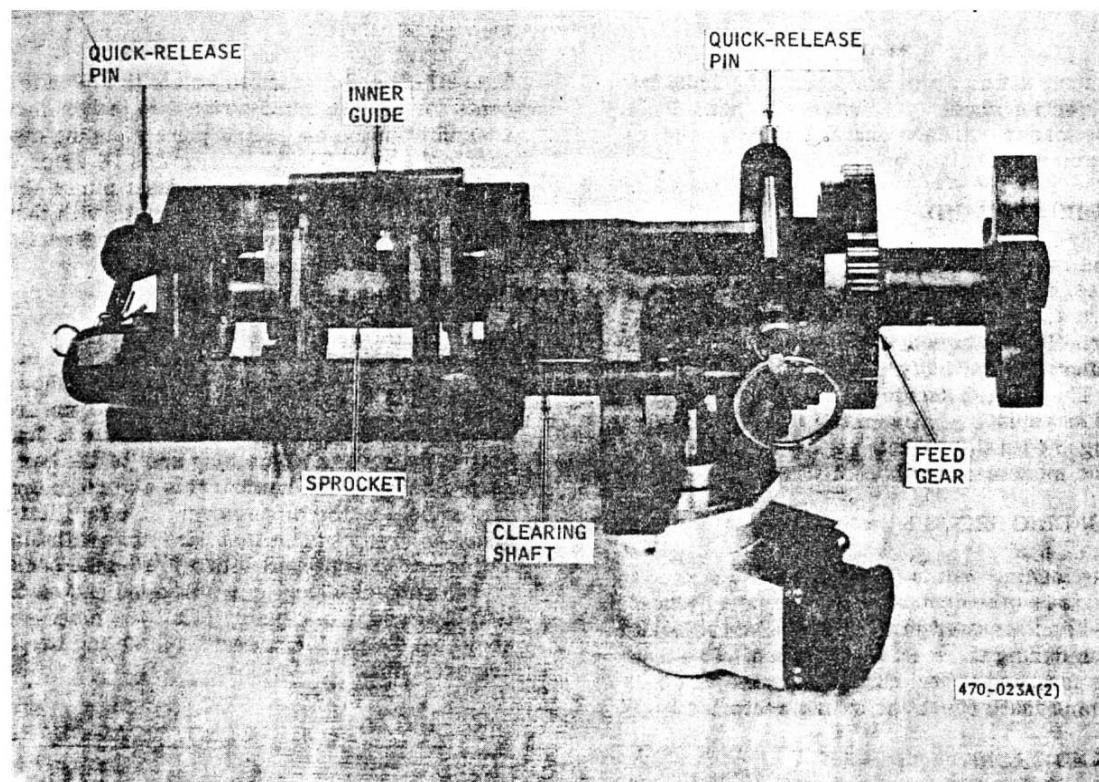
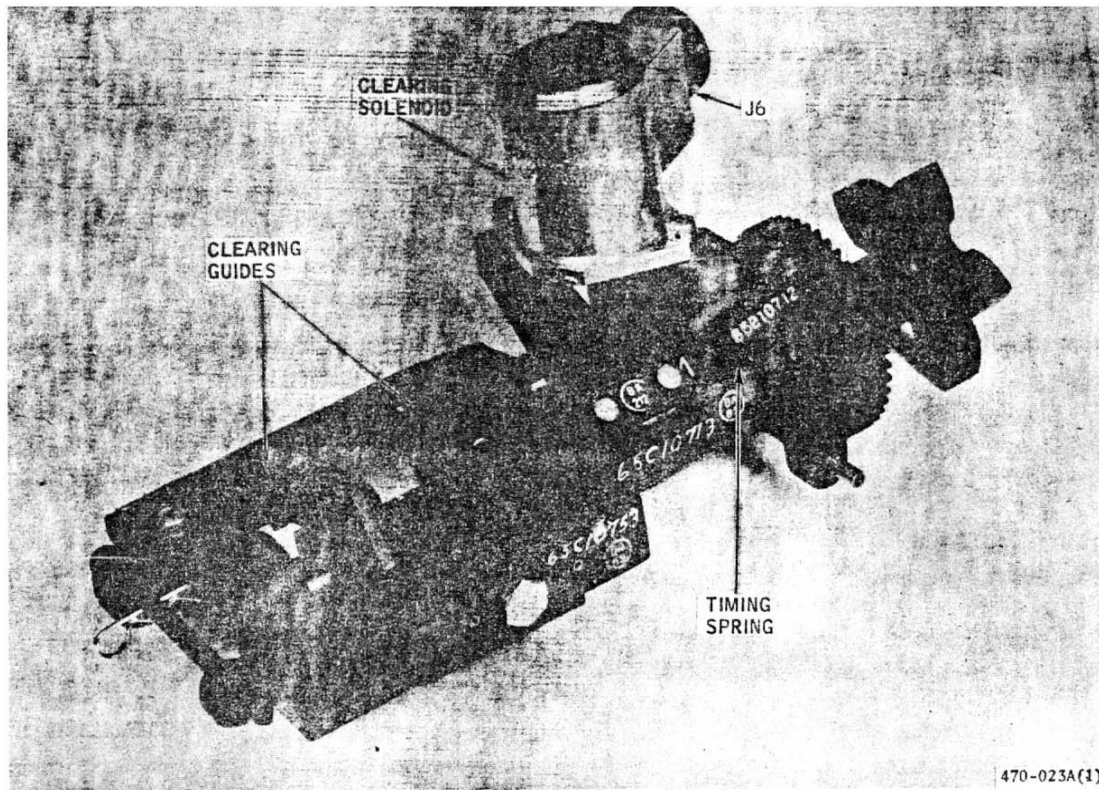


Figure 1-5. Feeder Assembly

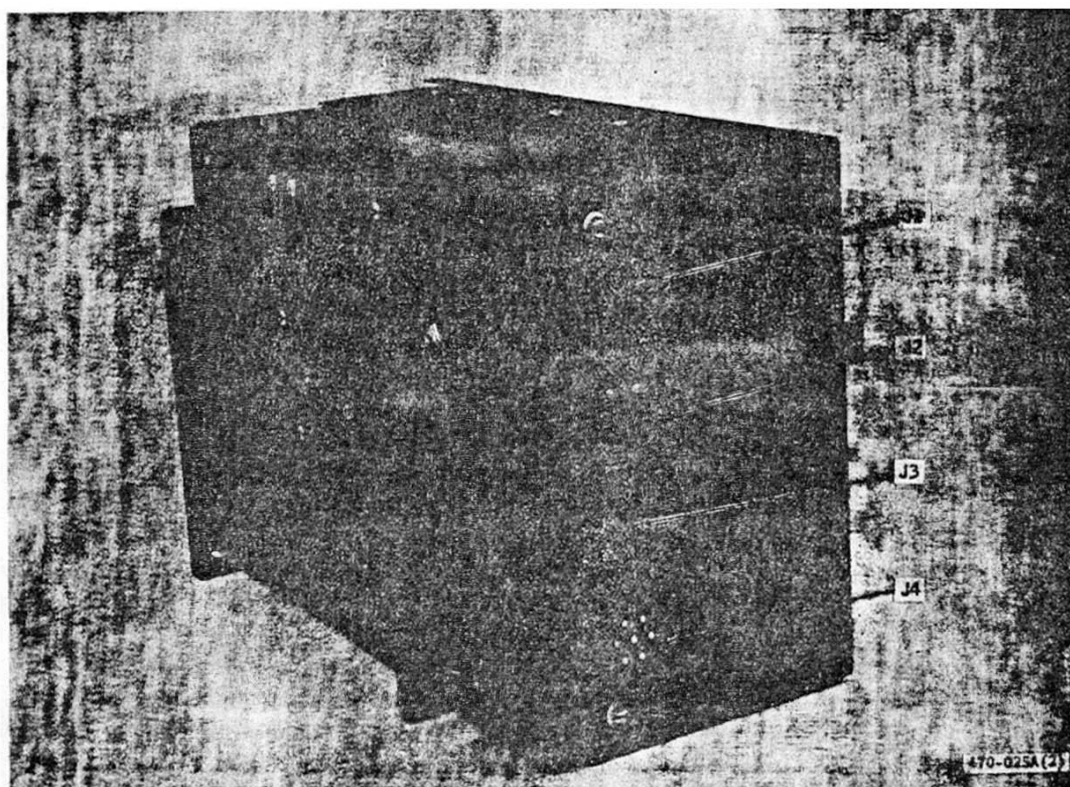
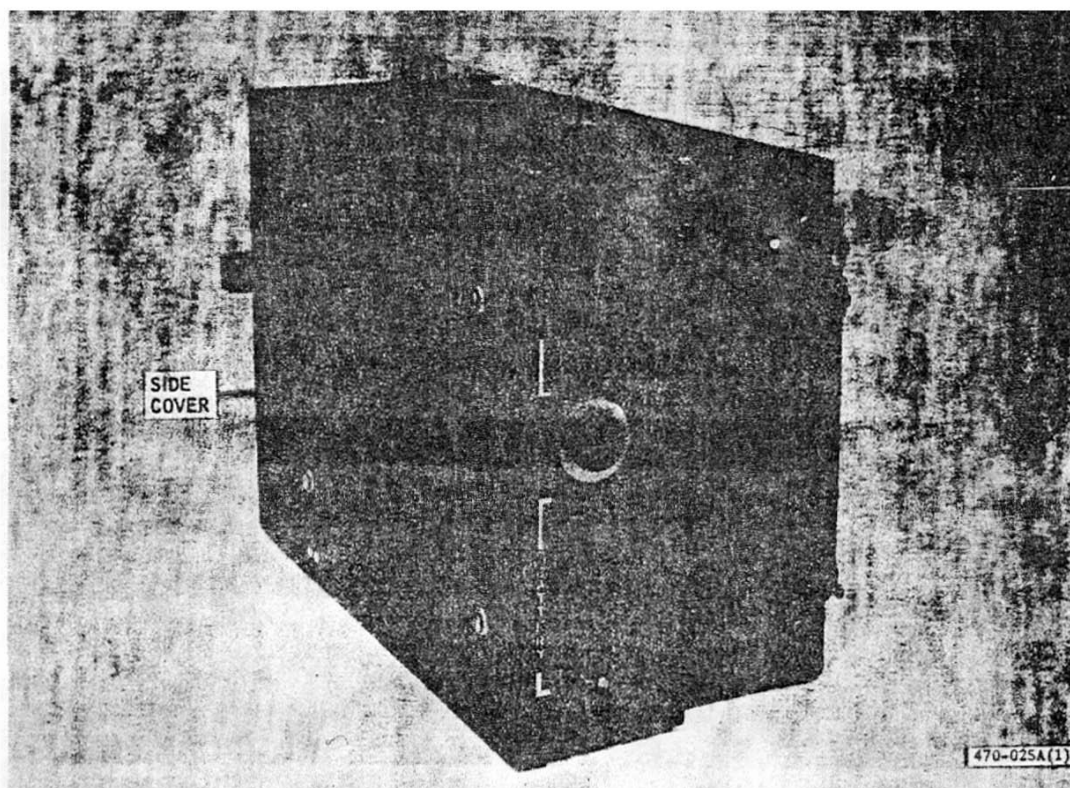
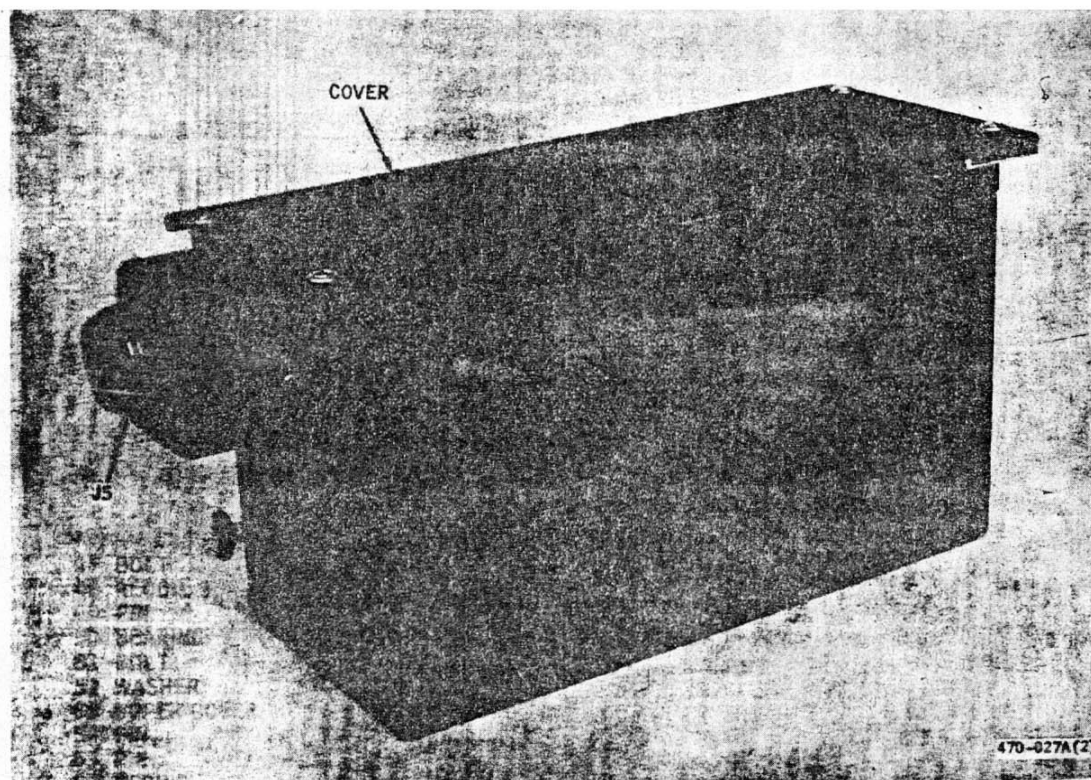
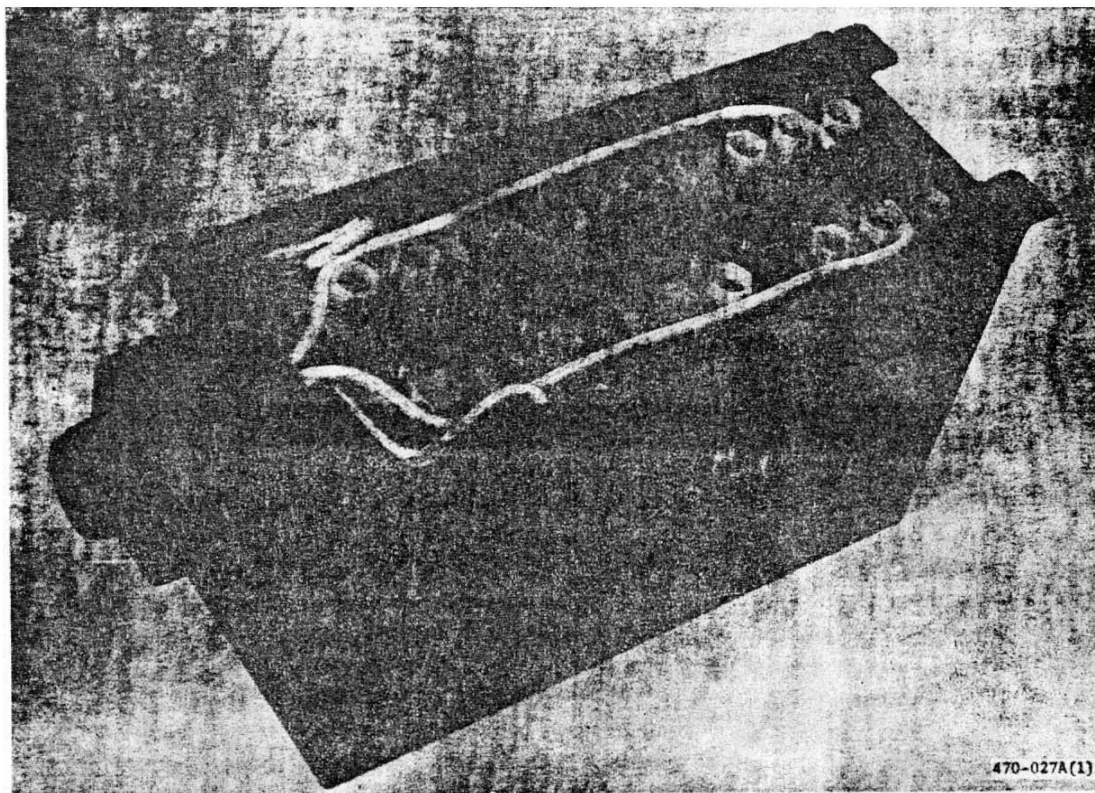


Figure 1-6. Control Assembly DCU-122/B



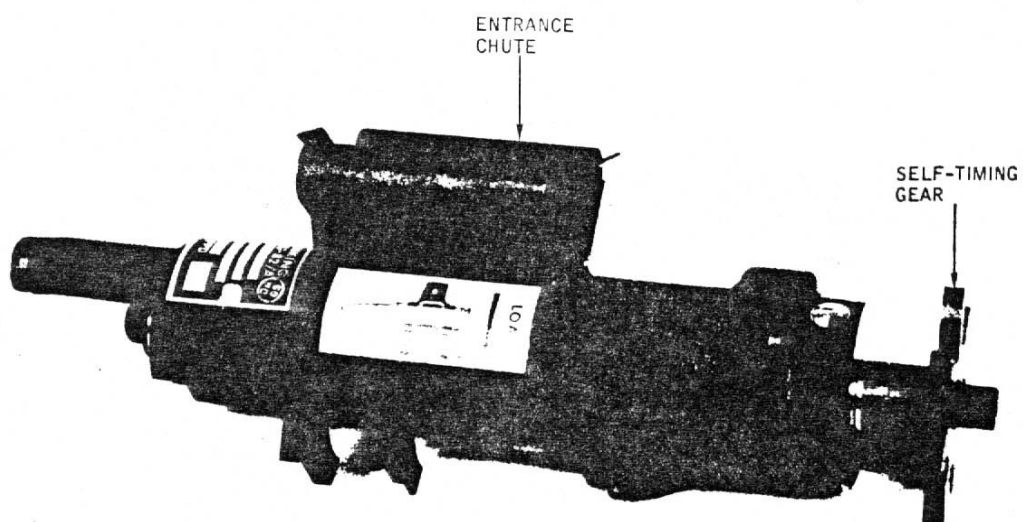
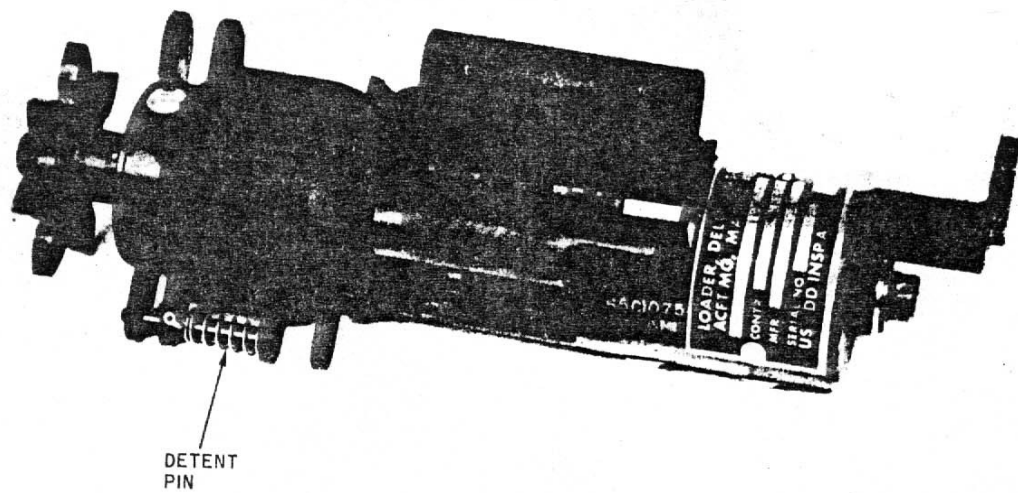


Figure 1-8. Delinking Loader MAU-82/A

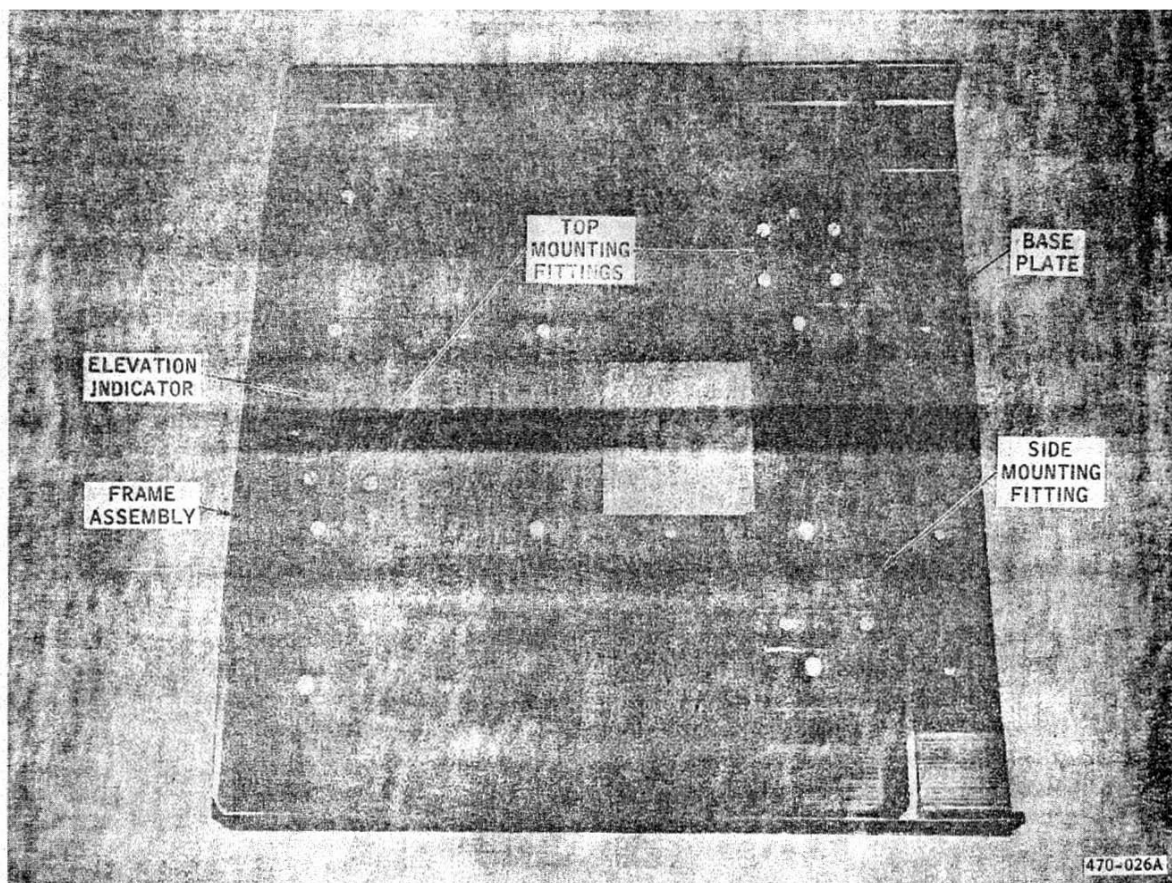


Figure 1-9. Module Stand

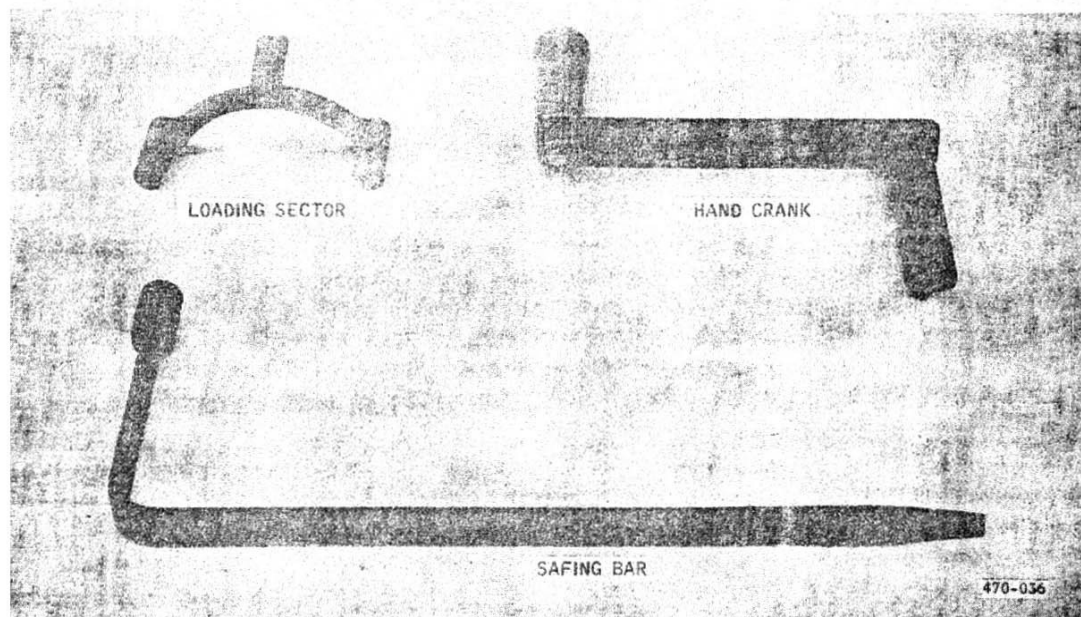


Figure 1-10. Loading Sector, Hand Crank and Safing Bar

TABLE 1-1. PHYSICAL AND ELECTRICAL CHARACTERISTICS

| | |
|--------------------------|--|
| Length | 36.20 inches |
| Width | 25.60 inches |
| Height | 42.30 inches |
| Weight | |
| Loaded | 379 pounds |
| Empty | 272 pounds |
| Ammunition Capacity | 2000 rounds ✓ 20 SECONDS |
| Gun | GAU-2B/A, 7.62-MM Aircraft Machine Gun |
| Ammunition | AP, NATO, M61 Ball, NATO, M59 Ball, NATO, M80 Tracer, NATO, M62 Dummy, NATO, XM172 |
| Links | M13 (loading only) |
| Firing Rate (selectable) | 6000 shots per minute 3000 shots per minute |
| Boresight Adjustment | Azimuth ± 3 degrees Elevation down 18 degrees up 3 degrees |
| Power Requirements | Self-contained battery 28 VDC, 15 amps. (battery charging and control functions only) |
| Operational Temperature | -65°F to +165°F |

1 - MALFUNCTION PER 25000 Rds