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MILITARY STANDARD

MACHINE AND AUTOMATIC GUNS AND MACHINEGUN TRAINERS THROUGH 30-MM

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ARMED FORCES SUPPLY SUPPORT CENTER

WASHINGTON 25, D. C.

Standardization Division

Machine and Automatic Guns and Machinegun Trainers Through 30-MM

MIL-STD-637A 13 FEBRUARY 1961

1. This standard has been approved by the Department of Defense and is mandatory for use by the Department of the Army, the Navy, and the Air Force.

2. In accordance with established procedure, the Standardization Division has designated the Ordnance Corps, the Bureau of Naval Weapons and Warner Robins Air Materiel Area, respectively, as Army-Navy-Air Force custodians of this standard.

3. Recommended corrections, additions, or deletions should be addressed to the Standardization Division, Armed Forces Supply Support Center, Washington 25, D.C.

FOREWORD

The purpose of this standard list guide design selection and limit procurement for stock and issue of adopted Machine and Automatic Guns and Machinegun Trainers through 30-MM in FSC 1005.

Prepared by the Army Ordnance Corps in conjunction with the Department of Defense Standardization Program, it is one of a series of limitation standards which will encompass all FSC 1005 weapons, accessories, and related-equipment.

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FIGURES

APPENDIX

1. SCOPE

1.1 This standard contains all machine and automatic guns, and machinegun trainers through 30-mm in FSC Classs 1005 for which Department of Defense standardization classification has been established as standard (Standardization Code 1) for use by the Military departments Selection for all new engineering and design applications and for repetitive use shall be made from this document.

1.2 Limited standard and nonstandard machine and automotive guns, and machinegun trainers through 30-mm are contained in Supplement 1 to MSS 1005-19; Guns, Machine and Automatic (Including Trainers) Through 30-mm.

2. REFERENCED DOCUMENTS

2.1 The issues of the following document in effect on the date of the invitation for bids form a part of this standard to the extent specified herein.

GOVERNMENTAL

MSS 1005-10-Supplement 1, Military Supply Limitation Standard, Guns, Machine and Automatic (Including Trainers) Through 30-mm.

3. DEFINITIONS

3.1 STANDARDIZATION CLASSIFICATIONS. A classification assigned to an item to describe and record its status with regard to suitability for service use. Standardization clasifications of items are defined below.

3.1.1 *Standard (standardization code 1).* Authorized for procurement, stock, and issue.

3.1.2 Limited *standard (standardization code 2).* Authorized for procurement only to support inservice materiel.

3.1.3 *Nonstandard (standardization code 3).* No longer needed and not authorized for procurement.

4. GENERAL REQUIREMENTS

4.1 Standard machineguns, automatic guns, and machinegun trainers. The following is a compilation of all standard machine and automatic guns and machinegun trainers through 30-mm arranged by weapon type. These items are authorized for procurement, stock, and issue in the military supply system and shall be used, wherever practicable, in future design of military materiel. Detailed data on each item is contained in section 5 herein.

4.1.1 *Machineguns*.

4.1.1.1 *Caliber .30.*

(a) Machinegun, caliber .30: M37.

41.1.2 7.62-mm.

(a) Machinegun, 7.62-mm: M60.
(b) Machinegun, 7.62 mm: fixed, M73.
(c) Machinegun, 7.62-mm: flexible, M73C,

4.1.1.3 Caliber .50.

(a) Machinegun, caliber .50: Browning, heavy barrel, (flexible), M2.
(b) Machinegun, caliber .50; Browning, heavy barrel, (turret type), M2.
(c) Machinegun, caliber .50: Browning, heavy barrel, (turret type), M2G.
(d) Machinegun, caliber .50: fixed, M85.
(e) Machinegun, caliber .50: flexible, M85C.

4.1.2 Automatic guns.

4.1.2.1 *20-mm*.

(a) Gun, 20-mm, automatic: MK 12 MOD O.
(b) Gun, 20-mm, automatic: MK 12 MOD 3.
(c) Gun, 20-mm, automatic: M39A2.
(d) Gun, 20-mm, automatic: M61.

4.1.3 Machinegun trainers.

4.1.3.1 Caliber .22.

(a) Trainer,. machinegun, caliber .22: M3.
(b) Trainer, machinegun, caliber .22: M4.

5. DETAIL REQUIREMENT

5.1 Detail data for standard items. (Standard for design and procurement).

5.1.1 *Caliber .30 machineguns.*

5.1.1.1 Machine gun, caliber .30: M37 FSN 1005-716-2946 (see fig. 1).

Description and application:

The caliber .30, M37 machinegun is an air-cooled version of the basic recoil operated Browning mechanism, designed primarily for installation in tanks. This weapon also may be removed from the tank and mounted on the M2 or M74 tripod mounts, and on the M1917A1 tripod mount (after removal of the link chute assembly) for emergency ground use. The Army is the only user of the M37 machinegun.

Physical and performance characteristics;

Weight of complete gun . . . . . 32.7 lb.

Length, overall w/o flash hider 41.6 in.
w/flash hider. 49.3 in.

Width, silhouette . . . . . 4.l in

Height, silhouette w/sight folded . 7.3 in.

Receiver length w/back plate and charging ,bar (in forward position). 19.6 in.

Length between receiver mounting points. 11.4 in.

Length, front of feedway to rear of receiver w/charging bar (in *forward* position). 18.9 in.

Barrel:

Length . . . . . 24.0 in.

Weight . . . . . 7.5 lb.

Quick change . . . . . No (screw type)

Method of operation . . . . . Recoil

Method of cooling . . . . . Air

Rate of fire w/rigid mount (deflection - 250,000 lb/in.) 575-700 rpm.
w/tripod mount. 525-650 rpm.

Cookoff protection . . . . . .None.

Direction of feed . . . . . Either side of receiver.

Trigger pull . . . . . 7-12 lb.

Belt pull,(min) . . . . . 10 lb.

Headspace . . . . . .(Adjustable) (.123-.128 in.)

Method of charging gun . . . . . Manual retracting bar (right aide).

Force required to change gun (Max). . . . . .38 lb. (approx.)

Method of firing . . . . . Manual trigger (pistol grip) (solenoid).

Type primer ignition . . . . . Percussion.

Case ejection . . . . . Bottom of receiver.

Link ejection . . . . . .Either side of receiver.

Link belt pitch . . . . . 51 in.

Type link (Ml) . . . . . .Pull-out metallic.

Type backplate . . . . . .Flexible (pistol grip).

Type safety . . . . . Sliding pin (blocks trigger).

Type flash hider . . . . . Cone.

Weight of 100 linked rounds . .6.7 lb.

Accuracy . . . . . At lease nine rounds of a 10-round burst shall group within or cut a 2-inch circle at a 100-foot range when fired from a rigid mount.

Ammunition:

Cartridge, cal. 30, ball, M2.

Cartridge, cal. 30, AP, M2.

Cartridge, cal. 30, tracers, Ml and M25.

Cartridge, cal. 30, dummy, M40.

Cartridge, cal. 30, blank, M1909.

Links:

Link, cartridge, metallic belt, cd. 30, Ml.

Link, cartridge, end, metallic belt, **.30** (can be used only after removing the link chute **assembly).**

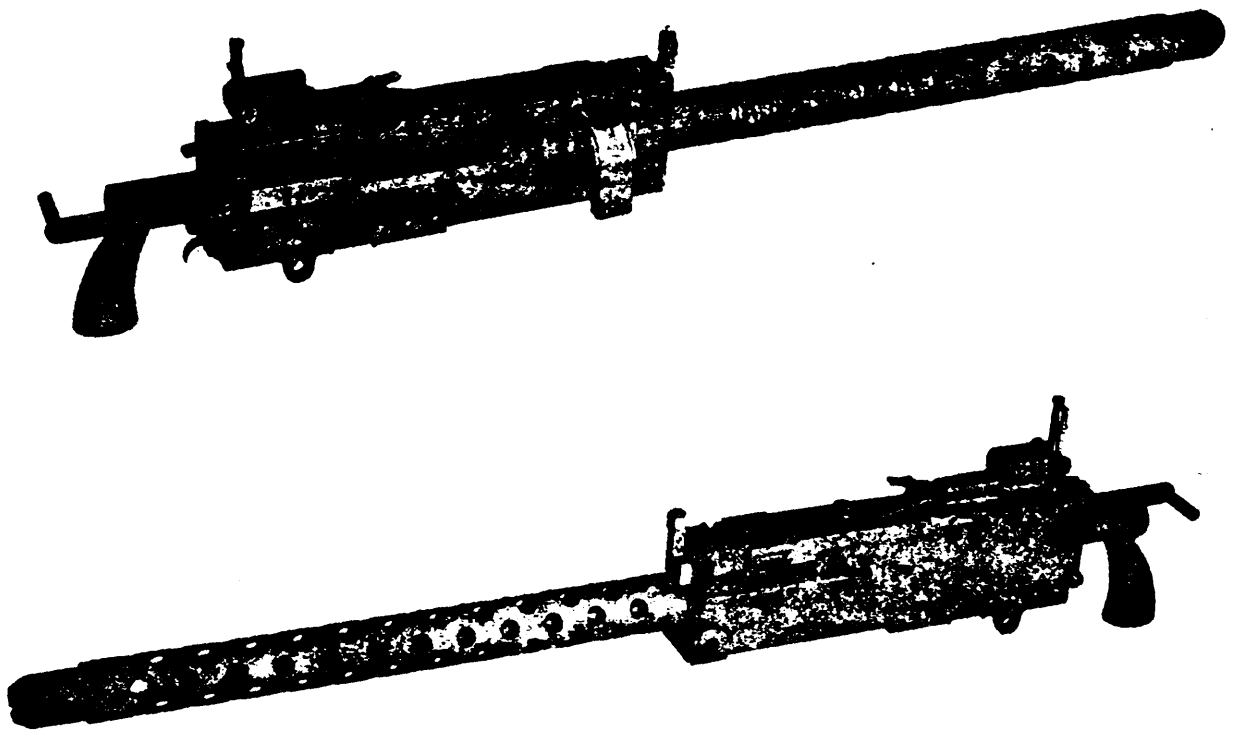

Figure 1. Machinegun, caliber 30: M37.

5.1.2 7.62-mm Machinegun.

5.1.2.1 Machinegun 7.62-mm: M60
FSN 1005-6W7710 w/e
FSN 100&752-764o w/o/e (see fig. 2).

Description and application:

The 7.62-mm, M60 machinegun is a lightweight, gas-operated, air-cooled, link-belt fed general purpose rnachinegun designed to replace all existing caliber .30 ground mounted machineguns. It is designed to fire the NATO standard 7.62-mm cartridge using the M13 link (the same cartridge-link combination used with the M73 machinegun) and is capable of being fired from either the hip, shoulder, or on the ground using its integral biped for the direct fire role and the M122 tripod mount for the prearranged fire role. The M60 machinegun is equipped with magazine bracket to accommodate 100 round magazine. It is used by the Army and Navy.

Physical and performance characteristics:

Weight of complete gun. . . . . .23.75 lb.
Length, overall . . . . . .43.1 in.
Width, silhouette w/biped and carrying handle foIded. 5.75 in.
Height, silhouette w/biped, sight and carrying handle folded. 9.5 in.
Length between receiver mounting points. 5.17 in.

Barrel:

Length, complete w/socket and flash hider. 25.7 in.
Weight, complete w/socket and flash hider. 83 lb.
Quick change . . . . . Yes
Method of operation . . . . . .Gas (cutoff and expansion)
Methd of cooling . . . . . Air
Rate of fire w/tripod mount . . . . .500-650 rpm
Cookoff protection . . . . Yes (open bolt).
Direction of feed . . . . In left side of receiver.
Trigger pull . . . . . 6-11 1/2lb.
Belt pull, (rein) capability . . . . . 8 lb.
Headspace . . . . . Fixed
Method of charging gun . . . .Manual cocking handle (right side).
Force required to thaw gun, (max.). 60 lb. (approx).
Method of firing . . . . Manual trigger (pistol grip).
Type primer ignition . . . . Percussion.
Case ejection . . . . . Right side of receiver.
Link ejection . . . . Right side of receiver.
Link belt pitch 58in
Type link (M13) . . . . . Push-through, metallic.
Type safety . . . . . Lever switch, blocks sear.
Type rear sight . . . . Folding leaf (micrometer).
Type front sight . . . . Fixed post.
Type flash hider . . . .Prong.
Sight radius . . . . . .212 in.
Sight graduation . . . . . Meters.
Weight of 100 linked rounds . . . . . .6 lb.
Accuracy . . . . . At least nine shots of a 10-round burst shall be within or cut the edge of a 10.8 inch diameter circle at a 100-yard range.

Ammunition:

Cartridge, 7.62-mm, ball, NATO, M59.
Cartridge, 7.62-mm, high pressure, NATO, M60.
Cartridge, 7.62-mm, AP, NATO, M61.
Cartridge, 7.62-mm, tracer, NATO, M62.
Cartridge, 7.62-mm, dummy, NATO, M63.
Cartridge, 7.62-mm, ball, NATO, M80.
Cartridge, 7.62-mm, blank, NATO, XM82.

Links:

Link, cartridge, metallic belt, 7.62-mm, M13.

5.1.2.2 Machinegun, 7.62-mm: fixed, M73 (see fig. 3).
FSN 1005-679-6763 w/e.

Descripion and application:

The 7.62-mm, M73, fixed machinegun is a lightweight, air-cooled, link-belt fed, combat vehicle mounted machinegun. It is recoil operated with

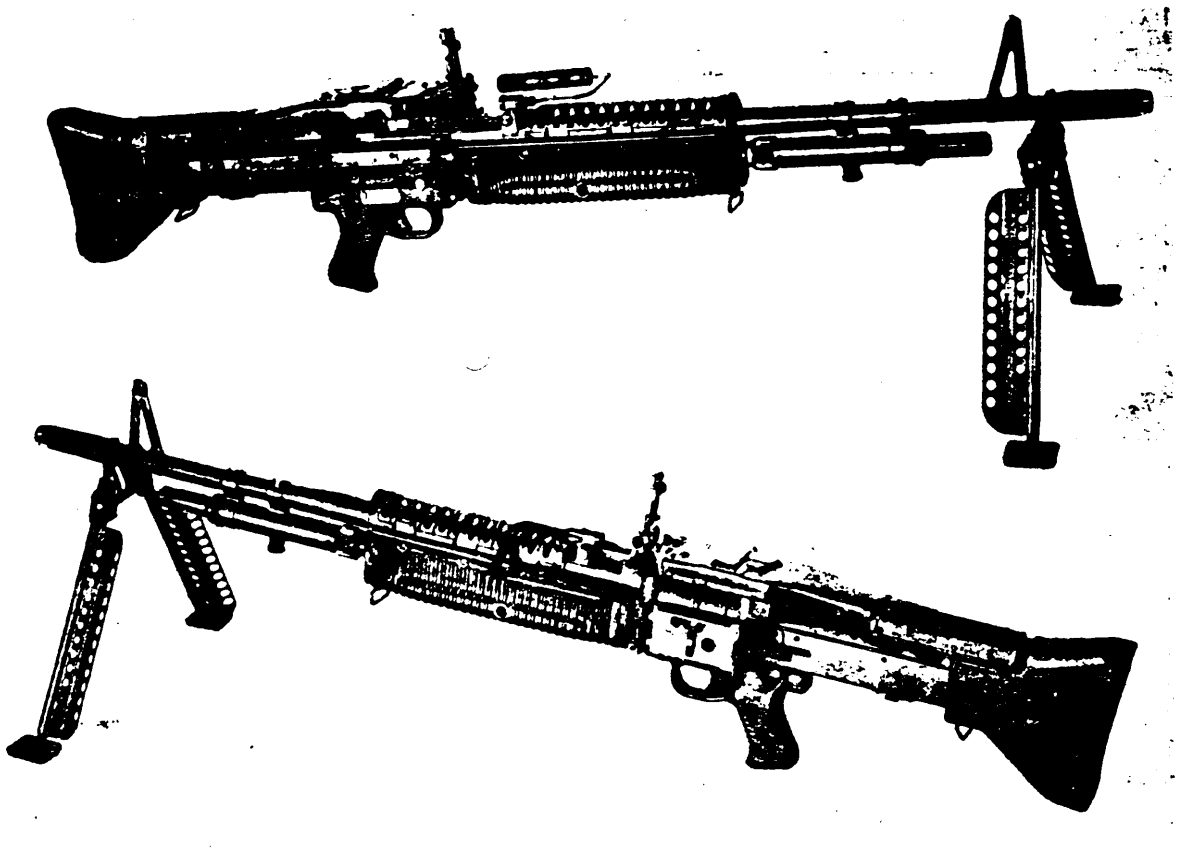

Figure 2. *Machinegun, 762-mm: M60.*

booster assist, and has a short receiver, fixed headspace, a quick-change barrel, and a flash hider. The M73 fixed machinegun is designed to fire the NATO 7.62-mm cartridge using the M13 link-the same cartridge-link combination used with the M60 general purpose machinegun.

The ammunition belt can be fed from either side of the weapon with change in cover assembly from one side to the other accomplished by repositioning of parts. Empty links are discharged from the side opposite the ammunition belt; empty cartridge cases are ejected from the bottom of the receiver. The weapon is charged by means of an integral manual charger. Firing is by manual or solenoid operation from the open-bolt position. The M73 fixed machinegun is used by the Army.

Phyiscal and performance characteristics:

Weight of gun (complete) . . . . . 28 lb.
Weight of barrel . . . . . 5 lb. 10 oz
Overall length of gun. . . . . 37 3/4 in.
Overall length of barrel . . . . . 22 in.
Overall width of gun . . . . . 44 13/32 in
Overall height of gun . . . . . 5 5/16 in.
Method of operation . . . . . Recoil-(gas booster assist).
Method of cooling . . . . . Air.
Rate of fire (rigid mount) . . . . .350-600 rpm.
Cookoff protection . . . . . Yes (open bolt).
Direction of feed . . . . . .Either side.
Headspace . . . . . .Fixed.
Method of charging gun. . . . . Manual charger.
Method of firing . . . . . Manual solenoid.
Case ejection . . . . . Bottom of receiver.
Link ejection . . . . . Side of receiver.
Type link (M13) ., ... push through, metallic.
Type safety . . . . . Spring-loaded slide block trigger.
Type sight . . . . . None.
Type flash hider . . . . . Cone.
Weight of 100 linked round . . . . . .6 lb.
Accuracy . . . . . Nine shots of a 10-round burst shall group within or cut the edge of a 10.8 dia. circle at a range of 100 yards.

Ammunition:

Cartridge, 7.62-mm, ball, NATO, M50.
Cartridge, 7.62-mm, high pressure, NATO, M60.
Cartridge, 7.62-mm, AP, NATO, M61.
Cartridge, 7.62-mm, tracer, NATO, M62.
Cartridge, 7.62-mm, dummy, NATQ, M63.
Cartridge, 7.62-mm, ball, NATO, M80.
Cartridge, 7.62-mm, blank, NATO, XM82.

Links:

Link, cartridge, metallic belt, 7.62-mm, M13.

5.1.2.3 Machinegun, 7.62-mm: flexible, M73C (see fig. 4)
FSN 1006-7914378 w/e.

Description and application:

The 7.62-mm, M73C machinegun is the flexible version of the M73 fixed machinegun and is identical to the M73 except that front and rear sights are mounted on the barrel jacket assembly designed to accept these sights and a pistol grip assembly is fastened to the back plate designed for this purpose. The M73C is used by the Marine Corps for vehicle armament and for ground use with the XM132 tripod mount.

Physical and performance characteristics:

The physical and performance characteristics are identical to the 7.62-mm, M73 fixed machinegun (FSN 1005-670-6763) except as follows:

Weight of gun complete . . . . . .30 lb. (approx.)
Overall length of gun w/pistol grip assembly. 42 3/4 in.
Overall height of gun . . . . . .7 3/4 in.
Type rear sight . . . . Folding leaf (micrometer)
Type front sight . . . . . Post, fold-down.
Sight radius . . . . . l8.5 in.
Sight graduations . . . . . Mils.

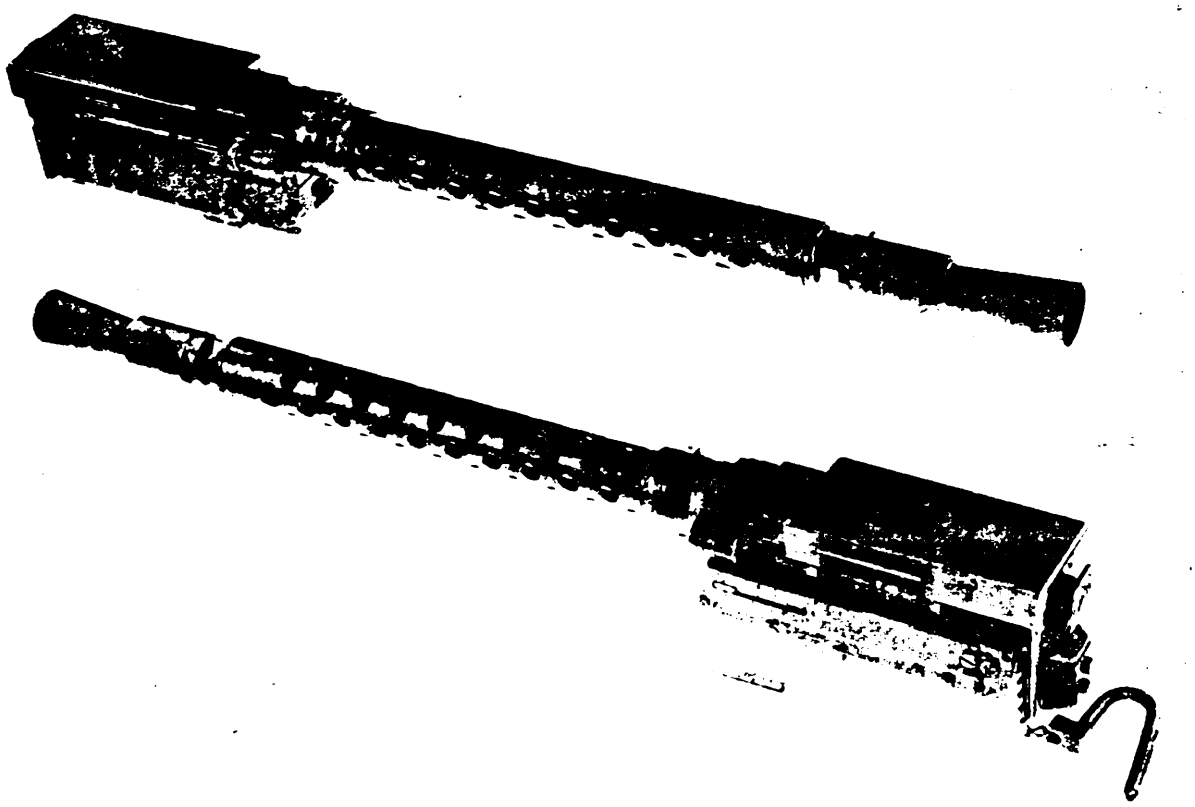

FIGURE 3. *Machinegun, 7.62-mm: fixed* M73.

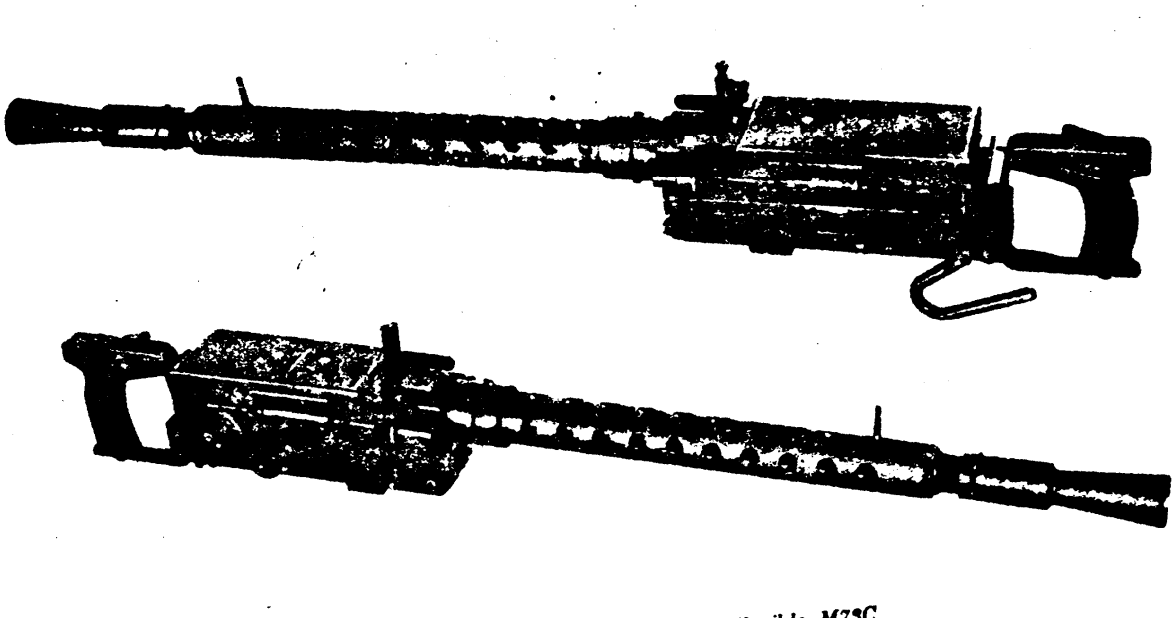

Figure 4. *Machinegun, 7.62-mm: flexible, M73C.*

5.1.3 Caliber 50, *machineguns*

5.1.3.1 Machinegun, caliber .50: Browning, heavy barrel, (flexible), M2.
FSN 1005-322-97I5 w/e.
FSN 1005-726-5636 w/o/e (see fig. 5).

Description and applicatim:

The caliber .50, M2, heavy barrel (flexible) air-cooled machinegun is a heavy version of the basic recoil operated caliber .30 Browning mechanism. This weapon is designed for ground, tank, armored vehicle, or naval deck installation as a flexible mounted machinegun. It may be used on the M63 or M65 AA mounts or on the M3 tripod mount. The M2, HB (flexible) machinegun is used by the Army, Navy, and Air Force.

Physical and performance characteristics:

Weight of complete gun . . . . . .84 lb.
Length, overall w/o flash hider 662 in.
w/ flash hider. 70.3 in.
Width, silhouette . . . . . 8.9 in.
Height, silhouette w/o barrel carrier, w/sight folded. 7.6 in.
Receiver length w/back plate . . . .26.4 in.
Length between receiver mounting points. 143 in.
Length, front of feedway to rear of receiver w/back plate. 25.4 in.
Barrel w/o flash hider:
Length . . . .45 in.
Weight . . . . . .28 lb.
Quick change . . . . . .No (screw type).
Method of operation . . . . . Recoil.
Method of cooling . . . . Air.
Rate of fire w/tripod mount . . . . .400-600 rpm.
Cookoff protection . . . . . .None.
Direction of feed . . . . Either side of receiver.
Force applied to trigger, (max.). . . . . .16 lb. (approx.)
Force applied to sear, (max.). . . . . .23 lb.
Force applied to sear slide, ... 35 lb. (max.).
Belt pull, (min.) . . . . . 20 lb.
Headspace . . . . Adjustable (202 – 206 in.)
Method of charging gun . . . . . Manual or retracting slide (either side).
Force required to charge gun, (max.). 105 lb. (approx.).
Method of firing . . . . . Manual back and side plate trigger.
Type primer ignition . . . . . Percussion.
Case ejection . . . . . Bottom of receiver.
Link ejection . . . . . .Either side *of* receiver.
Link belt pitch ., ... 88 in.
Type (link (M9) . . . . . pull-out. metallic.
Type safety . . . . . .No safety.
Type back plate . . . . . F1exible (spade grips).
Type rear sights . . . . . Folding leaf (micrometer).
Type front sight . . . . . Fixed post.
Type flash hider . . . . Cone.
Sight radius . . . . . 19.9 in.
Sight scale adjusted to . . . . . 2,600 yd.
Weight of 100 linked rounds . . . . . 292 lb.
Accuracy . . . . . All shots of a 10-round burnt shall group within an 8-inch circle at a 100-foot range when fired from a rigid mount.

Ammunition:

Cartridge, cal. .60, ball, M33.
Cartridge, cal. 50, API, M8.
Cartridge, cal. 50, API-T, M20.
Cartridge, cal. .50, incendiary, M1,
Cartridge, cal. 50, tracer, M17.
Cartridge, cal. 50, dummy, M2.

Links:

Link, cartridge, metallic belt, cal. 50, M2.
Link, cartridge, metallic belt, cal. .50, M9.

5.1.3.2 Machinegun, caliber .50: Browning, heavy barrel (turret type), M2, (see fig. 6).
FSN 1005-322-9721 w/e.

Description and application:

The caliber .50, M2, heavy barrel (turret type) air-cooled machinegun is a heavy version of the basic recoil operated caliber .30 Browning mechanism and is identical to the M2, HB (flexible) machinegun with the exception of a fixed type back plate (without spade grips, bolt latch, and trigger) rather than the flexible type back

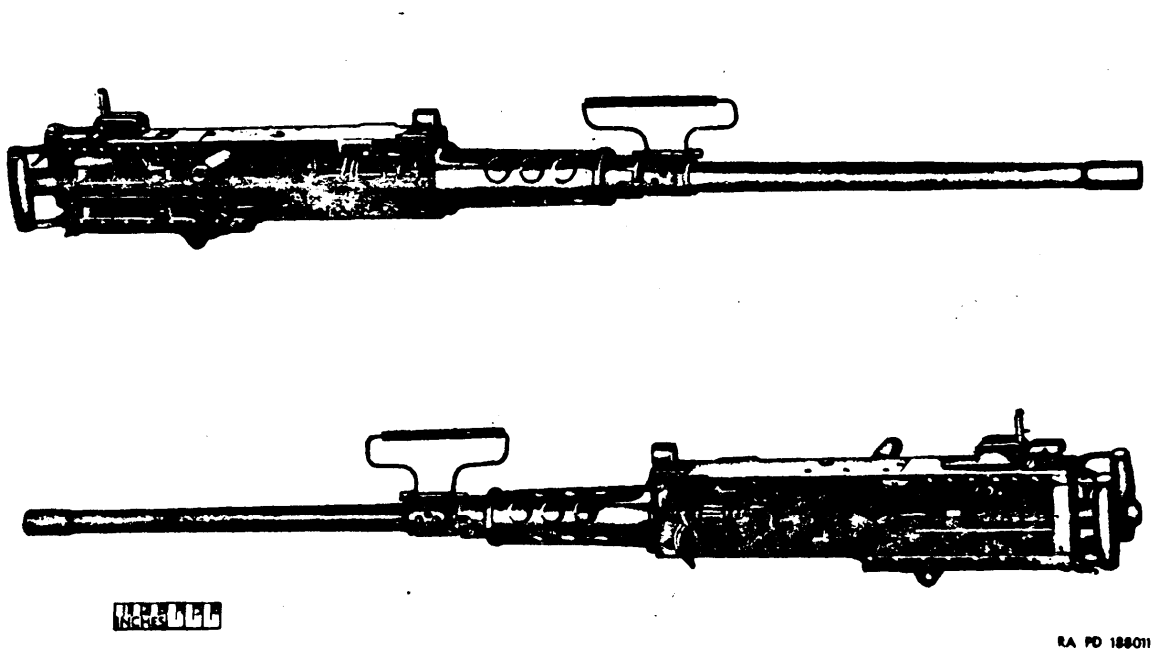

FIGURE 5. *Machinegun, caliber .50 Browning, heavy barrel (flexible), M2.*

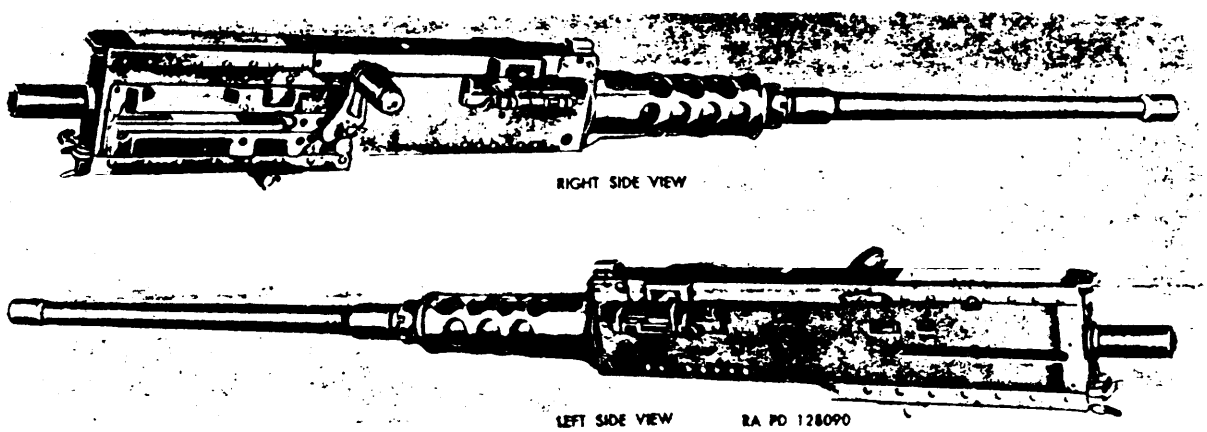

Figure 5. *Machinegun, caliber 50: Browning, heavy barrel (flexible), M2.*

plate and the sights, flash hider, and barrel carrier removed. This weapon is used by the Army as an antiaircraft gun (with the M55 multiple trailer mount) and as a turret gun on armored vehicles and tanks (M59 armored vehicle, M48 series tanks, and M84 mortar carrier).

Physical and performance characteristics:

Weight of complete gun . . . . . 80 lb.
Length, overall . . . . . .65.2 in.
Width, silhouette . . . . . .7.8 in.
Height, silhouette . . . . . 6.7 in
Receiver length w/back plate . . . . .26.4 in.
Length between receiver mounting points. 143 in.
Length, front of feedway to rear of receiver w/back plate. 25.4 *in.*

Barrel :

Length . . . . . .45 in.
Weight . . . . . .28 lb.
Quick change . . . . . No (screw type).

Method of operation . . . . . .Recoil.
Method of cooling . . . . . Air.
Rate of fire w/rigid mount . . . . . 450-600 rpm. (deflection-250,000 lb/in).
Cookoff protection . . . . . None.
Direction of feed . . . . . Either tide of receiver.
Force applied to sear, (max.) . . . . . 23 lb.
Force applied to sear slide, (max.). 35 lb.
Belt pull, min.) . . . . . 20 lb.
Headspace . . . . . Adjustable(202-206) in.)
Method of charging gun . . . . . Manual or retracting elide (either side).
Force required to charge gun, (max.). 105 lb. (approx.).
Method of firing . . . . . Electrical solenoid.
Type primer ignition . . . . . Percussion.
Case ejection . . . . . .Bottom of receiver.
Link ejection . . . . . .Either side of receiver.
Link belt pitch . . . . . .88 in.
Type link (M9). . . . . .Pull-out, metallic.
Type safety . . . . . None.
Type back plate . . . . . .Fixed (no trigger or spade grips).
Type rear sight . . . . . None.
Type front sight . . . . . None.
Type flash hider . . . . . None.
Weight of 100 linked rounds . . . . . .29.2 lb.
Accuracy . . . . . All shots of a 10-round burst shall group within an 8-inch circle at a 100-foot range when fired from a rigid mount.

Ammunition:

Cartridge, cal. .50, ball, M33.
Cartridge, cal. .50, API, M8.
Cartridge, cal. .50, API-T, M20.
Cartridge, cal. .50, incendiary, M1
Cartridge, cal. .50, tracer, M17.
Cartridge, cal. .50, dummy, M2.

Links:

Link, cartridge, metallic belt, cd. .50, M2.
Link, cartridge, metallic belt, cal. .50, M9.

5.1.3.3 Machinegun, caliber .50: Browning, heavy barrel, (turret type), M2G, w/o/e
FSN 1005-602-2105.

Description and application:

The caliber .50, M2G, heavy barrel machinegun is a modification of the caliber .50, M2 heavy barrel, turret-type gun, designed for use with the M45-series multiple machinegun mounts. The M1O charger is attached in place of the retracting slide group, a 24-volt top plate solenoid is used in place of the original top plate, and certain components of the spade grip trigger group repIace the side plate trigger to provide a manual triggering device. It is used by the Army.

Physical and performance characteristics:

The physical and performance characteristics are identical to the caliber .50, M2, heavy barrel machinegun (FSN 1005-322--9721) except as follows:

Method of firing . . . . Electric solenoid or manual trigger.
Type safety . . . . . .Sliding latch on back. plate blocks trigger.
Type back plate. . . . . Fixed (not spade grip).

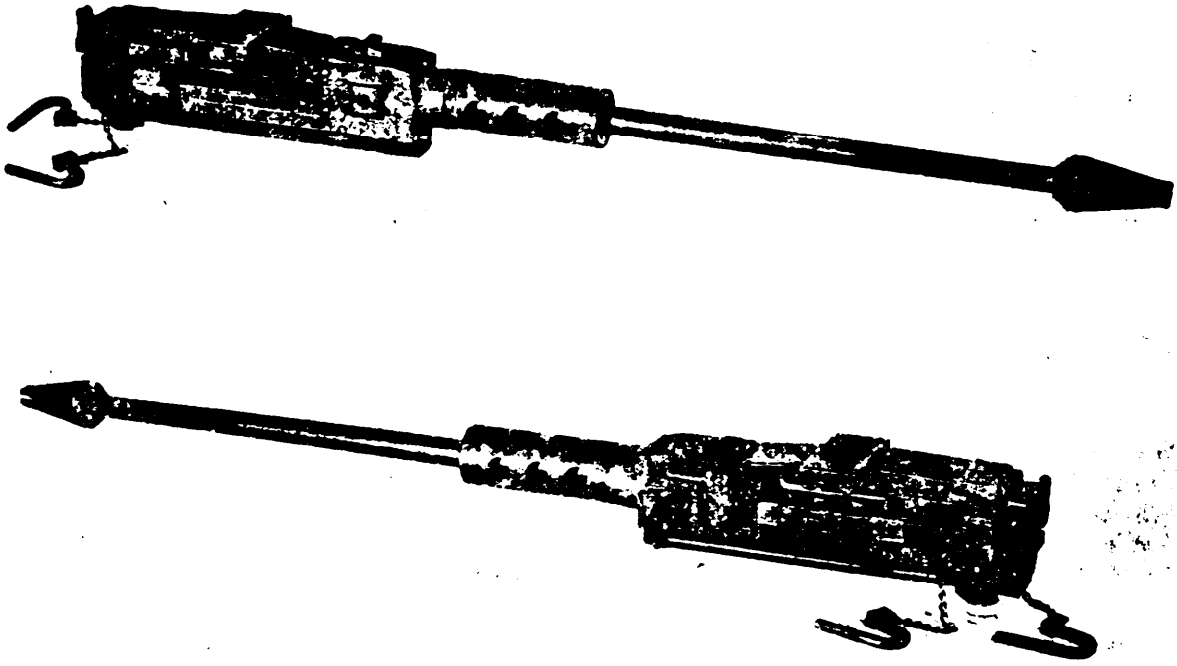

Figure 7. *Machinegun, caliber .50: fixed, M85.*

5.1.3.4 Machinegun, caliber .50: fixed, M85. FSN 1005-690-2790 (see fig. 7).

Description and application:

The caliber .50, M85, fixed machinegun is an air-cooled, link-belt fed machinegun designed for tank cupola or coaxial installations. It is recoil operated, and has a short receiver, fixed headspace, a quick change barrel and a flash suppressor. The ammunition belt is fed from either side of the weapon with change from one side to the other accomplished by disassembling a limited number of components and repositioning them. Field stripping is easily and quickly performed as quick release pins and locking mechanisms are extensively used. The M85 fixed machinegun is used by the Army and the Marine corps.

Physical and performance characteristics

Weight of complete gun . . . . . 61.5 lbs.
Length including flash suppreaeor. 54.5 in.
Width . . . . . 53 in.
Height . . . . . 6.0 in.

Barrel:

Length . . . . . .36.0 in
Weight . . . . . 14.4 1b.
Quick change . . . . . Yes

Method of operation Recoil.
Method *of cooling* Air.

Rate of fire w/rigid mount:

High . . . . . 1050 ± 50 rpm.
Low . . . . . 400 ± 50 rpm.

Cookoff protection . . . . . Yes (open bolt).
Direction of feed . . . . . Left or right.
Manual sear-off force (min.) . . . . . 30 lb.
Belt pull . . . . . 30 lb.
Headspace . . . . . Fixed.
Method of charging gun . . . . . Manual.
Method of firing gun . . . . . Manual or solenoid.
Case ejection . . . . . Side.
Link ejection . . . . . Side.
Type link (M15) . . . . . Push through) metallic.
Type safety . . . . . , ... Spring 1ock.
Type sight . . . . . None.
Type flash suppressor . . . . . Prong
Weight of 100 linked rounds . . . . . 29.2 lbs.
Accuracy . . . . . (To be inserted when requirement have km fully established).

Ammunition:

Cartridge, cal. .50, ball, M33.
Cartridge, cal, 30, API M8.
Cartridge, cal. .50, API&T, M20.
Cartridge, cal. 50, incendiary, Ml.
Cartridge, cd. .50, tracer, Ml7.
Cartridge, cal 50, dummy, M2.

Link:

Link, cartridge, metallic belt, cal. .50, M15.

5.1.3.5 Machinegun, caliber .50: flexible, M85C (see fig. 8)
FSN l005-791-3379 w/e.

Description and application:

The caliber .50, M85C machinegun is the flexible version of the M85 fixed machinegun and is identical to the M85 except that a front sight is mounted to the front of the receiver and a spade grip assembly is fastened to the rear of the receiver by means of a quick release device. A rear sight is mounted on the spade grip assembly. The M85C flexible machinegun is used on the XM133 tripod mount. It is used by the Army and Marine Corps.

Physical and performance characteristk:

The physical and performance characteristics are identical to the caliber .50, M85 fixed machinegun (FSN 1005-690-2790) except as follows:

Weight . . . . . 66 lb. (approx.)
Height . . . . . .796 in.
Width . . . . . .6 in.
Length of complete gun w/spade grip assembly. 57.5 in.
Type of rear sight . . . . . Adjustible ramp.
Type of front sight . . . . . .Post, fold-down
Sight radius . . . . . l8.7 in.
Sight graduations . . . . . Meters.

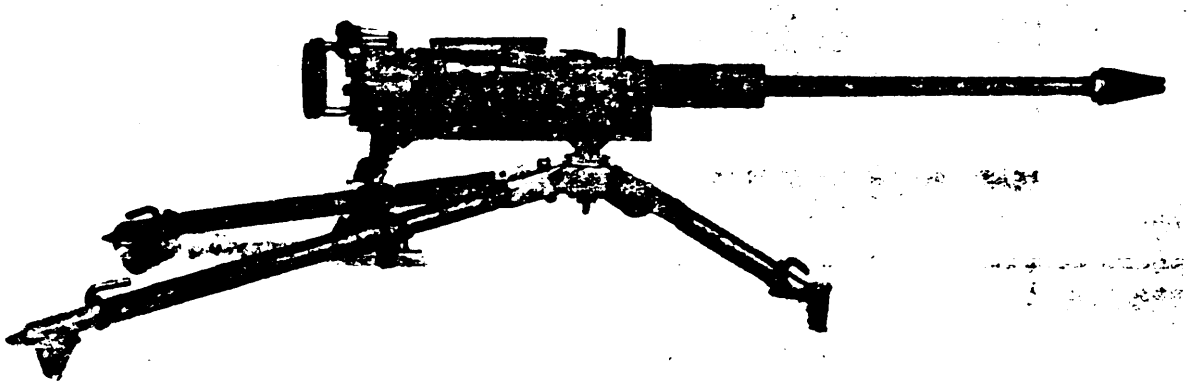

FIGURE 8. *Machinegun, caliber .50: flexible, M86C*

(shown on mount, tripod, machinegun: XM133).

5.1.4 *20-mm automatic guns.*

5.1.4.1 Gun, 20-mm, automatic: MK 12 MOD 0.
FSN 1005-544-9251 (see fig. 9)

Description and application:

The 20-mm MK 12 MOD 0 automatic gun is an air-tooled, link-belt fed, combination gas-blowback operated automatic gun used for fixed aircraft mountings. It is a redesign of the basic 20-mm M3 automatic gun mechanism and fires electric primed ammunition from the front seared (closed bolt) position. It is equipped with the pneumatic (MK 7 MOD 0 or MK 7 MOD 2) type feeder and is charged by an integral pneumatic charger. The MK 12 MOD 0 automatic gun is used only by the Navy.

Physical and performance characteristics:

Weight of complete gun and feeder . . . . . 101.3 lb.
Weight of MK 7 feeder . . . . . l3.3 lb.
Length, overall . . . . . .75.1 in.
Width, silhouette w/MK 7 feeder. 628 *in.*
Height, silhouette w/MK 7 feeder. 7.3 in.
Recoil of receiver . . . . . .88 in. (min.), 13 in. (max.).

Barrel:

Length . . . . . .52.5 in.
Weight . . . . . 31.31b.
Quick change . . . . . No (screw type).

Method of operation . . . . . Combination gas blowback.
Method of cooling . . . . . Air (deflection-250,000 lb/in.).
Rate of fire w/rigid mount . . . . . .l000 rpm.
Horsepower-weight ratio . . . . . (Horsepower per lb. of gun wt.) 16.
Cookoff protection . . . . . None.
Direct.ion of feed . . . . . Either side of receiver.
Belt pull, (min.) . . . . . .70 lb.
Headspace . . . . . Adjustable.
Method of charging gun . . . . . Pneumatic charger (integral).
Method of firing . . . . . Electrical impulse firing pin.
Type primer ignition . . . . . .Electric
Case ejection . . . . . Bottom of receiver.
Link ejection . . . . . Side of feed mechanism.
Link belt pitch . . . . . l.4 in.
Type link (MK 2 MOD 0 or 2 . . . Side-stripping, metallic.
Weight of 100 linked rounds . . . . . .69.0 lb.

Ammunition:

Cartridge, 20-mm, electric, AP-T, ZT, MK 108.
Cartridge, 20-mm, electric, API, ZR, MK 107.
Cartridge, 20-mm, electric, HEI, ZQ, MK 106 and MODS.
Cartridge, 20-mm, electric, TP, ZS, MK 106.

Links:

Link, cartridge, disintegrating belt, 20-mm, MK 2 MOD O or 2 w/end Link, MOD 1.

5.1.4.2 Gun, 20-mm, Automatic: MK 12 MOD 3.
FSN 1005-544-9253 (see fig. 10) .

Description and application:

The 20-mm MK 12, MOD 3 automatic gun is a modification of the 20-mm MK 12 MOD 0 designed to use the MK 9 MODS 2 and 4 (RH) and 3 and 5 (LH) rotary recoil operated feeder. It fires the electric primer cartridge from the front seared (closed bolt) position. It is used by the Navy in aircraft as a fixed mounted weapon.

Physical and performance characteristics:

Weight of complete gun w/cradle and feeder. 115 lb.
Weight of cradle . . . . . .9.0 lb.
Weight of MK 9 MOD 5 feeder.. 27.0 lb.
Length, overall. . . . . 75.1 in.
Width, silhouette . . . . . .6.25 in.
Height, silhouette . . . . . .7.7 in.
Recoil of receiver . . . . . .88 in. (min.), 1.3 in, (max.).

Barrel:

Length . . . . . 525 in.
Weight . . . . . 31.51b.
Quick change . . . . . No (screw type).

Method of operation . . . . . Combination gas-blowback recoil,
Method of cooling . . . . . Air (deflection-250,000 lb/in.)

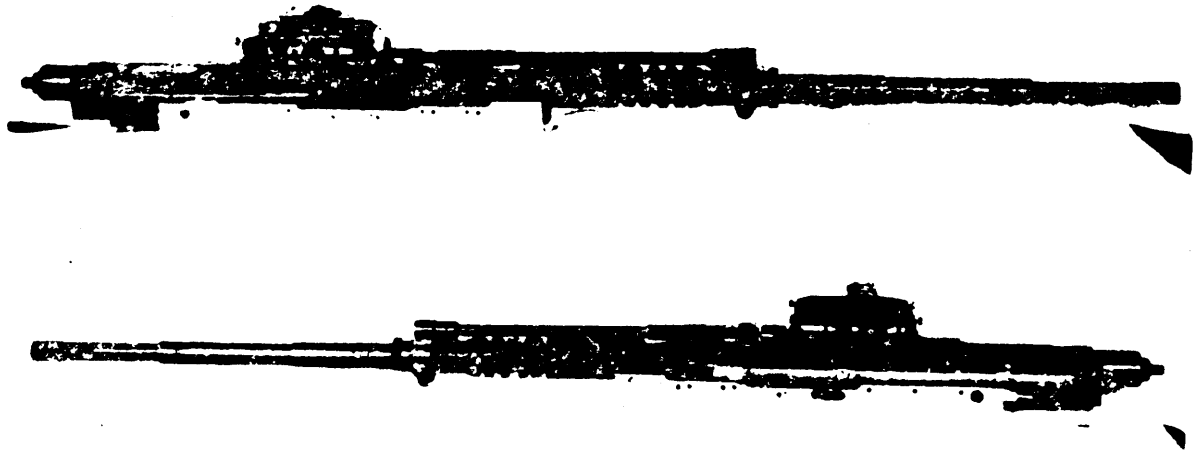

FIGURE 9. *Gun, 20-mm, automatic: MK 12 MOD 0.*

Figure 10. *Gun, 20-mm, automatic: MK 12 MOD 3.*

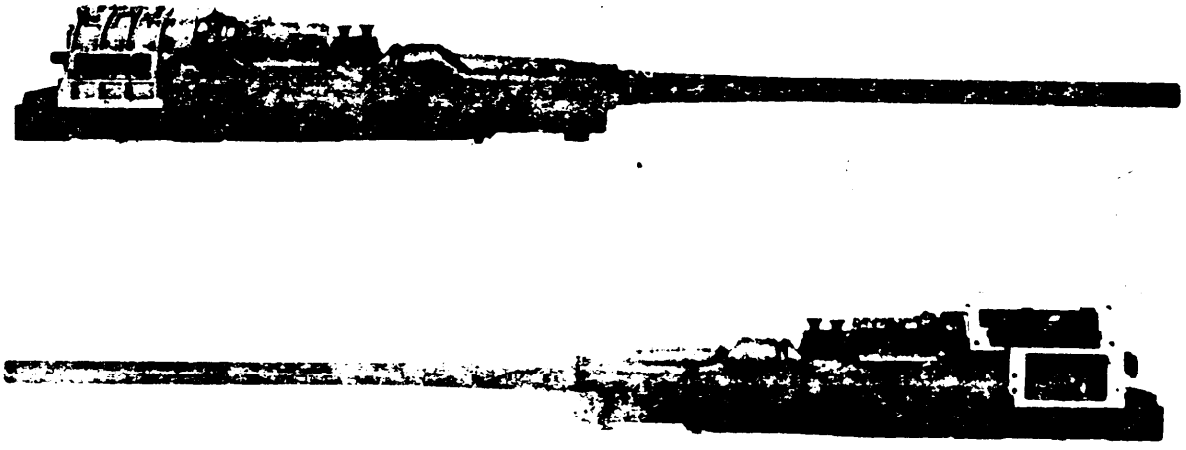

FIGURE 11. *Gun, 20-mm automatic: M39A2.*

Rate of fire w/rigid mount . . . . . 1000 rpm.
Horsepower-weight ratio . . . . . (Horsepower per lb. of gun wt.) 16.

Cookoff protection . . . . . None.
Direction of feed . . . . . Righ side(MK9 MODS 2 and 4).
Left side (MK 9 MODS 3 and 6).

Belt, pull, (min) . . . . . .70 lb.
Headspace . . . . . Adjustable.
Method of charging gun . . . . . Pneumatic charger, (integral) .
Method of firing . . . . . Electrical impulse to firing pin.
Type primer ignition . . . . . Electric.
case ejection . . . . . .Bottom of receiver.
Link ejection . . . . . Side of feed mechanism.

Link belt pitch . . . . . l.4h.
Type link (MK2 MOD O or 2). . . . . .Side-stipping, metallic.

Weight of 100 linked rounds. . . . . .69.0 lb.

Ammunition:

Cartridge, 20-mm, electric, AP-T, ZT, MK 108.
Cartridge, 20-mm, electric, API, ZR, MK 107.
Cartridge, 20-mm, electric, HEI, ZQ, MK 103 and MODS.
Cartridge, 20-mm, electric, TP, ZS, MK 106.

Links:

Link, cartridge, disintegrating belt, 20-mm, MK 2 MOD 0 or 2 w/end link MOD 1.

5.1.4.3 Gun, 20-mm, automatic: M39A2. FSN 1005-566-0044 (R.H.). FSN 1005-566-0045 (L. H.) (see fig. 11).

Description and application:

The 20-mm, M39A2 automatic gun is an air-cooled, link-belt gas-operated, revolver-type automatic gun for fixed or flexible mounting in aircraft. It fires electric primed ammunition from a 5-chamber drum which revolves about an axis parallel to the barrel bore; firing occurs as each drum chamber is indexed to a 6 o'clock position. Change from right-hand to left-hand feed is accomplished by replacing some parts and rqmiticming other parts. It is wed only by the Air Force.

Physical and performance characteristics:

Weight of complete gun . . . . . .179 lb.
Length, overall . . . .72.2 in.
Width, silhouette . . . . . 10.4 in.
Height, silhouette . . . . . 8.4 in
Receiver length . . . . . 37.9 in
Length between receiver Mounting points . . . . . 26.5 in.

Barrel:
Length . . . . . 53.5 in.
Weight . . . . . 29.4 lb.
Quick change . . . . . .Yes (interruped) locking lugs).

Method of operation . . . . . Gas.
Method of cooling . . . . . Air.
Rate of fire w/rigid mount . . . . . (Deflection-250,000 lb/in) 1500 rpm.
Horsepower-weight ratio . . . . . .(Horsepower per lb of gun wt.) 9.8.
Cookoff protection . . . . None.
Direction of feed . . . . . Either side of receiver.
Belt pull, (min.) . . . . . .100 1b.
Headspace . . . . . Fixed.
Method of charge gun . . . . . Manual.
Force required to charge gun, (max.). 230 lb. (approx.).
Method of firing . . . . . Electrical inpulse to firing pin.
Type primer ignition . . . . . Electric.
Case ejection . . . . . Rear or side of feeder.
Link ejection . . . . . Either side off feeder.
Link belt pitch . . . . . l.8 in.
Type link (M12) . . . . . .Push through. metallic.

Type flash suppressor . . . . None.
Weight of 100 linked rounds . . . . . 72.0 lb.
Accuracy . . . . . The redial disperson (standard deviation) shall not exceed 1% roils in *a* burst of 50 rounds when mounted on *a* structure having a rigidity of 250,000 pounds per inch deflection.

Ammunition:

Cartridge, 20-mm, electric, API, M53.
Cartridge, 20-mm, electric, HEI, MS6A1.
Cartridge, 20-mm, electric, ball, M56A1.
Cartridge, 20-mm, dummy, MM.

Links:

Link, cartridge, disintegrating bell 20-mm, M12.

5.1.4.4 Gun, 20-mm, automatic: M61
FSN 1005-52042620 (see fig. 12).

Description and application:

The 20-mm, M61 automatic gun is an air-cooled, link-belt fed rotating multiple barrel-type automatic gun for fixed or turret-type mounting in aircraft. It is designed on the Gatling principle and fires electric primed ammunition from each of the six barrels as the rotating portion of the weapon turns through one revolution. The gun is externally operated by an electric or hydraulic drive depending upon the aircraft installation. It is used only by the Air Force,

Physical and performance characteristics

Weight of gun w/M2 or M3 feeder and w/M7 drive.	303 lb.
Weight of gun w/M2 or M3 feeder and w /M12 drive,	293.8 lb
Length, overall w/M2 or M3 feeder and w/M7 drive.	72.6 in.
Length, overall w/M2 or M3 feeder and w/M12 drive.	76.6 in.
Width, silouette w/M2 or M3 feeder and w/M7 drive.	16.9 in.
Width, silhouette w/M2 or M3 feeder and w/M12 drive.	13.0 in.
Height, silhouette w/M2 or M3 feeder and w/M7 drive.	132 in.
Length, front of feeder opening to resr of housing w/M7 drive.	11.9 in.
Length between housing mounting points.	22.8 in.

Barrel:

Length	60.0 in.
Weight	l8.0 lb.
Quick change	Yes (interrupted locking lugs) .
Method of operation	Electric(M7)or hydraulic (M12) drive.
Method of cooling	Air.
Rate of fire w/M7 drive	.4,000 to 400 rpm to rpm.
Rate of fire w/M12 drive	6,000 to 7,200 rpm.
Homepower-weight ratio for 4,000 rpm.	(Horsepower per lb. of gun weight) 16.6.
Homepower-weight ratio for 4,000 rpm.	(Homepower per lb. of gun weight) 24.9.
Cookoff protection	Feeders M2 and M3.
Direction of feed	Right-hand aide-Stripping disinte-glating belt.
Belt pull (max.)	100 lb
Headspace	Fixed.
Method of charging gun	self-charging by means of drives.
Method of firing .,	.Electrical impulse to firing pin.
Type primer ignition	Electric.
Case ejection	Bottom of housing when battery is positioned at 12:00 o'clock.
Link ejection	Bottom of housing when battery is positioned at 12:00 o'clock.
Link belt pitch	l.6 in.
Type links (M14 and M17)	.Side-stripping, metallic.
Type flash suppressor	None.
Weight of 100 linked rounds	.69.0 lb.
Accuracy	.80 percent of a l04-round burst shall be within an 8.0-inch diameter circle at 1000 inches, and the center of the 80 percent group shall be within 4.75 inches left or right and 25 inches above or below point of aim.

Ammunition:

Cartridge, 20-mm, electric, API, M53.
Cartridge, 20-mm, electric, HEI, M56A1.
Cartridge, 20-mm, electric ball, M55A1.
Cartridge, 20-mm, dummy, M51-series.

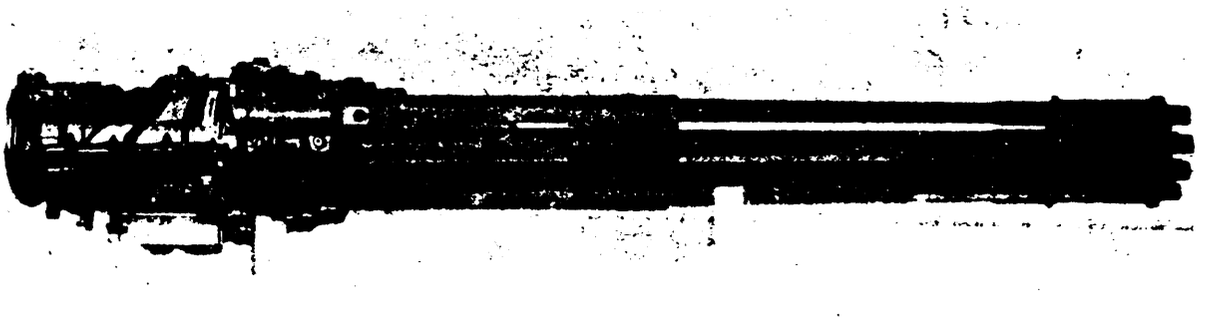

Figure 12. *Gun, 20-mm, automatic: M61.*

FIGURE 12. - *Continued.*

Links:

Link, metallic, cartridge, 20-mm, M14 (used with M2 feeder).
Link, metallic, cartridge, 20-mm, M17 (used with M3 feeder).

5.1.5 *Machinegun trainers.*

5.1.5.1 Trainer, Machinegun, Caliber .22: M3 FSN 1005-678-7369 w/e (see fig. 13).

Description and application:

The caliber .22, M3 machinegun trainer is a conversion of the caliber .30 M1917A1 water-cooled machinegun, designed to fire the caliber .22 long rifle cartridge. The functioning of the M3 trainer, which operates on the floating chamber principle, is identical to that of the M1917A1, except that 'the recoiling force is received from a piston rather than the barrel which is fixed. Conversion of the M1917A1 to the M3 trainer is accomplished by exchanging the main group assemblies. This trainer is used by the Army to simulate actual firing action of the caliber .30 M1917Al machinegun.

Physical and performance characteristics:

Weight of complete trainer w/o water. 32.5 lb.
w/water. 39.6 lb.
Length, overall . . . . . 38.6 lb.
Width, silhouette . . . . . 4.6 in.
Height, silhouette . . . . . 6.8 in.
Receiver length w/backplate . . . . . 19.2 in.
Length between receiver mounting points. 11.4 in.
Barrel length . . . . . 22.8 in.
Method of operation . . . . . Recoil.
Method of coding . . . . . Water.
Amount of coolant . . . . . 8 pt.
Rate of fire . . . . . 450-600 rpm
Direction of feed . . . . . Left side of receiver.
Trigger pull . . . . . 7-12 1b.
Method of charging trainer . . . . . Manual bolt handle, (right side).
Force required to charge trainer, 38 lb. (approx.) (max.).
Method of firing . . . . . Manual trigger (pistol grip).
Type primer ignition . . . . . Percussion.
Case ejection . . . . . Bottom of receiver.
Fabric belt ejection . . . . . Right side of receiver.
Fabric belt pitch . . . . . 51 in.
Type link . . . . . Fabric adapter belt.
Type back plate . . . . . Flexible (pistol grip).
Type safety . . . . . None.
Type rear eight . . . . . Folding leaf (micrometer).
Type front sight . . . . . Fixed post.
Type flash hider . . . . . None.
sight radius . . . . . 26.3 in.
Sight scale adjusting to . . . . . 2600 yd.

Ammunition:

Cartridge, cal. 22, commercial ball, long rifle.

Links:

A special fabric cartridge belt is provided for feeding the belt adapters (which hold the cal. 22 cartridge) to the gun.

5.1.5.2 Trainer, Machingun, caliber .22: M4 FSN 1005-678-7370 w/e (see fig. 14).

Description and application:

The caliber .22, M4 machinegun trainer is a conversion of the caliber .30 M1919A4 (flexible) machinegun designed to fire the caliber .22 long rifle cartridge. The functioning of the M4 trainer, which operates on the floating chamber principle, is identical to that of the M1919A4 except that the recoiling force is received from a piston rather than the barrel which is fixed. Conversion of the M1919A4 (flexible) gun to the M4 trainer is accomplished by exchanging the main group assemblies. This trainer is used by the Army to simulate actual firing action of the caliber .30 M1919A4 (flexible) machinegun.

Physical and performance characteristics:

Weight of complete trainer . . . . 32 lb.
Length, overall . . . . . 41.1 in.
Width, silhouette . . . . . 3.8 in.
Height, silhouette . . . . . 7.4 in.
Receiver length w/black plate . . . . 192 in.

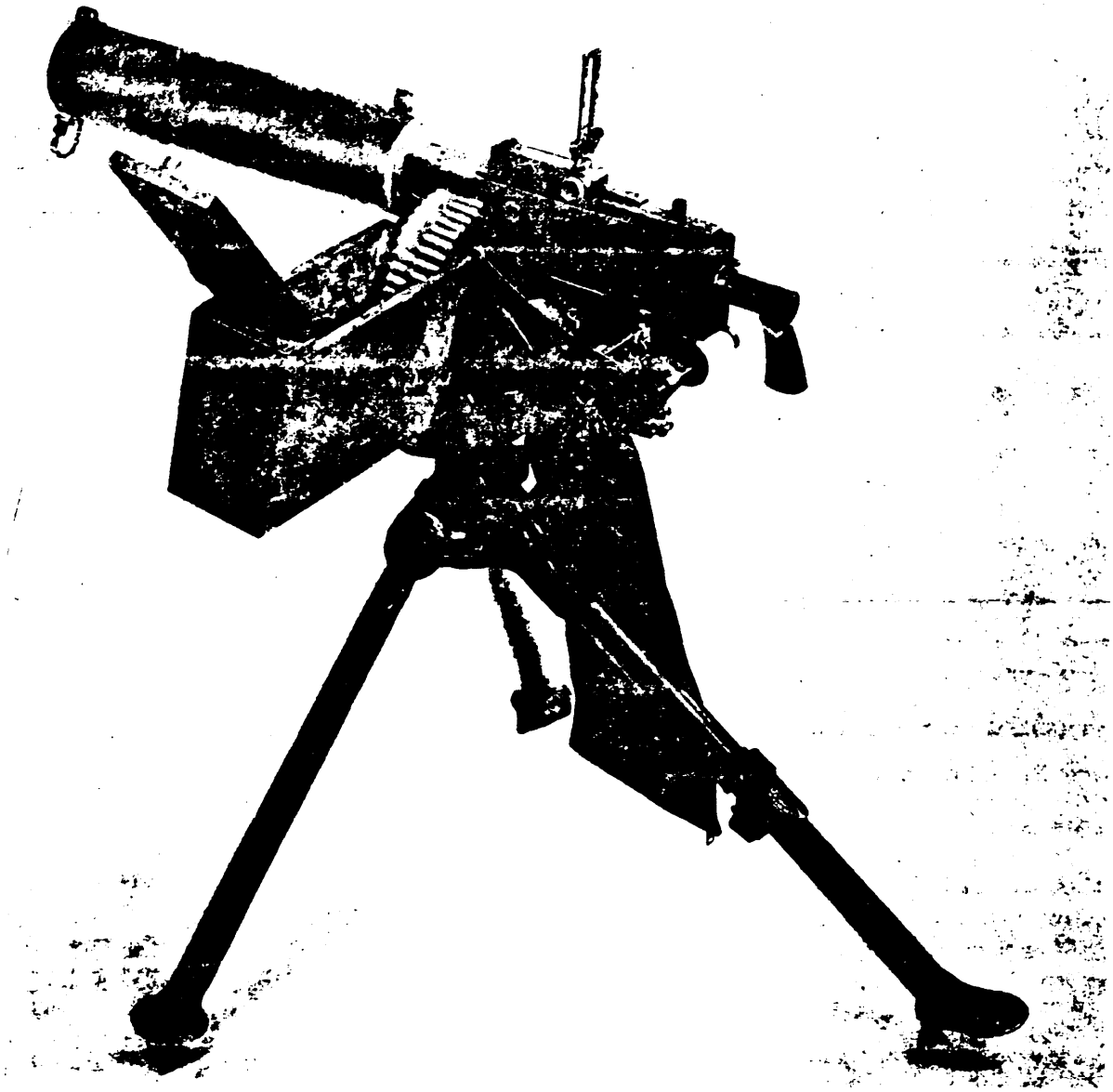

FiGURE 13. *Trainer, machinegun, caliber 22: MS*

(shown on mount, tripod, machinegun, cal. 30, *M1917A1).*

FIGURE 14. *Trainer, machinegun, caliber 22: M4*

(shown on mount, tripod, machinegun, cal. 30, M1917A1).

Length between receiver mounting points.	11.4 in.
Barrel length	22.8 in.
Method of operation	Recoil.
Method of cooling	Air.
Rate of fire	400-550 rpm.
Cook off protection	None.
Direction of fed	Left side of receiver.
Trigger pull	7-121b.
Method of charge trainer	Manual bolt handle. (right side).
Force required to charge trainer (mu.).	36 lb. (approx.).
Method of firing	Manual trigger (pistol grip).
Type primer ignition	Percussion.
Case ejection	Bottom of receiver.
Fabric belt ejection	Right side of receiver.
Fabric belt pitch	51 in.
Type link	Fabric adapter belt.
Type backplate	Flexible (pistol grip).
Type safety..,	None.
Type rear sight	Folding leaf (micrometer).
Type front sight	Fired post.
Type flash hider	None.
Sight radius	l3.9 in.
Sight scale adjusted to	2400 yd.

Ammunition:

Cartridge, cal. 22, commercial ball, long rifle.

Links:

A special fabric cartridge belt is provided for feeding the belt adapter (which hold the cal. 22 cartridge) to the gun.

(Copies of specifications, standards, drawings, and publications required by contractor in connection with specific procurement functions should be obtained from theprocurhg agency orudimcted by the ~-Oflioer.)

(Copies of this standard for Military use may be ob-bined as indicated in tbe foreword to the Index of Military Specifications and Standards,)

(Both the title and identifying symbol number should be stipulated when requesting eopiea of MiIitary utand-ards.)

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APPENDIX A

ALPHABETICAL INDEX

SPECIFICATION ANALYSIS SHEET

Form Approved
Budget Bureau No. 119-R004

INSTRUCTIONS

This sheet is to be filled out by personnel either Government or contractor, involved in the use of the specification in procurement of products for ultimate use by the Department of Defense. This sheet is provided for obtaining information on the use of this specification which will insure that suitable products can be procured with a minimum amount of delay and at the least cost. Comments and the return of this form will be appreciated. Fold on lines on reverse side, staple in corner, and send to preparing activity *(as indicated on reverse hereof)*.

SPECIFICATION

ORGANIZATION *(Of submitter)* | CITY AND STATE

CONTRACT NO. | QUANTITY OF ITEMS PROCURED | DOLLAR AMOUNT $

MATERIAL PROCURED UNDER A

☐ DIRECT GOVERNMENT CONTRACT ☐ SUBCONTRACT

1. HAS ANY PART OF THE SPECIFICATION CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE?

A. GIVE PARAGRAPH NUMBER AND WORDING.

B. RECOMMENDATIONS FOR CORRECTING THE DEFICIENCIES.

2. COMMENTS ON ANY SPECIFICATION REQUIREMENT CONSIDERED TOO RIGID

3. IS THE SPECIFICATION RESTRICTIVE?

☐ YES ☐ NO IF "YES", IN WHAT WAY?

4. REMARKS *(Attach any pertinent data which may be of use in improving this specification. If there are additional papers, attach to form and place both in an envelope addressed to preparing activity)*

SUBMITTED BY *(Printed or typed name and activity)* | DATE

DD FORM 1 APR 63 1426 REPLACES NAVSHIPS FORM 4863, WHICH IS OBSOLETE C-8279

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