

MIL-M-45920

30 July 1971SUPERSEDING  
(See Section 6)

## PROPOSED

## MILITARY SPECIFICATION

## MACHINE GUN, AIRCRAFT 7.62MM: M134 (GAU-2B/A)

This specification is mandatory for use by all Departments and Agencies of the Department of Defense.

## 1. SCOPE

1.1 This specification covers one type of multibarrel, electrically driven, 7.62-millimeter (mm) machinegun for installation in aircraft armament systems.

## 2. APPLICABLE DOCUMENTS

2.1 The following documents, of the issue in effect on date of invitation for bids or request for proposal, form a part of the specification to the extent specified herein:

## SPECIFICATIONS

<u>Military</u>	
MIL-P-116	- Preservation, Methods of.
MIL-W-13855	- Weapons, Small Arms and Aircraft Armament Subsystems, General Specification for.
MIL-F-45598	- Feeder, Delinking, Machine Gun, Aircraft MAU-56/A.
MIL-I-45607	- Inspection Equipment, Supply and Maintenance of.
MIL-L-46150	- Lubricant, Semi-Fluid: Low Friction (Automatic Weapons).

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## STANDARDS

<u>Military</u>		
MIL-STD-105	-	Sampling Procedures and Tables for Inspection by Attributes.
MIL-STD-109	-	Quality Assurance Terms and Definitions.
MS21318	-	Screw, Drive, Round Head, Type U, Steel, Carbon, Cadmium Plated.

## DRAWINGS

<u>U.S. Army Weapons Command</u>		
65F9877	-	Aircraft, Machine Gun, 7.62MM (GAU-2B/A).

(Product drawings referenced in this specification form a part of 65F9877.)

## PUBLICATIONS

<u>U.S. Army Weapons Command</u>		
P65F9877	-	Packaging Data Sheet for Aircraft Machine Gun, 7.62MM: M134 (GAU-2B/A).
IEL11013164	-	Index of Inspection Equipment List.

(Acceptance inspection equipment drawings referenced in this specification form a part of IEL11013164.)

(Copies of specifications, standards, drawings, and publications required by suppliers in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

## 3. REQUIREMENTS

3.1 First article. Requirements for submission of the first article shall be as specified in the contract (see 6.1). Unless otherwise specified (see 6.1), the first article shall include the pilot pack (see 5.1).

3.2 Materials and construction. Machineguns and parts shall conform to the materials and construction requirements specified herein, on Drawing 65F9877 and drawings applicable thereto, and shall be in accordance with the applicable materials and construction provisions of MIL-W-13855.

3.3 Design. Machineguns and parts shall conform to the design specified herein, on drawing 65F9877 and drawings applicable thereto, and shall be in accordance with the applicable design provisions of MIL-W-13855.

3.3.1 Aft bearing. The aft bearing shall fit in the housing to its full depth of seat, shall be lubricated with the lubricant specified on the applicable drawing, and the inner race of the bearing shall rotate without binding.

3.3.2 Aft gun support. The aft gun support shall be fastened securely to the rotor with the bolts as specified on the applicable drawing so that there shall be no relative movement of the aft gun support on the rotor and shall retain the rotor within the housing.

3.3.3 Barrels. The barrels shall be so fabricated that upon being assembled to the rotor assembly, the requirement for targeting and accuracy hereinafter prescribed shall be capable of being met.

3.3.3.1 The barrels shall be free of cracks, seams, and mutilations. The bore and chamber shall be free of foreign matter, corrosion, pits, burs, sharp edges, bulges, and deformation. The chromium plating in the chamber and bore shall be free of nodules, anode burns, flaking, and stripping. Scratches or marks, occurring in the chamber which otherwise meets the surface roughness requirements, shall be permitted provided they do not cause marks on the case of a high-pressure test cartridge fired in the chamber (see 4.6.3). The barrels shall be proof and magnetic particle inspection marked in accordance with the applicable drawings.

3.3.3.2 With the barrel clamp removed, the barrels shall assemble to and disassemble from the rotor assembly without the use of tools.

3.3.4 Barrel clamp. The barrel clamp shall be fastened securely to the barrel by the bolt as specified on the applicable drawing so that there shall be no relative radial movement of the barrel clamp on the barrels.

3.3.5 Bolt assemblies. The bolt assemblies shall move through their full range of travel on the trackways of the rotor assembly without binding. During the forward motion of the bolt assemblies, the firing pin tang shall engage the cam on the rotor and shall be held in the cocked position on the rotor until rotation of the bolt head causes disengagement of the firing pin tang. Once disengaged from the rotor, the firing pin shall be driven forward by spring action. With the removable tracks removed from the rotor assembly, the bolt assemblies shall readily assemble to and disassemble from the trackways of the rotor assembly. The firing pin shall move through its full range of travel in the bolt body and bolt

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head under spring action without binding. The firing pin spring shall be retained in the firing pin by spring stop and spring pin. The locking pins shall be securely retained in the bolt head by the spring pin so that there shall be no relative movement of the locking pins. The cam roller shall be retained on the bolt body by the thrust washer as specified on the applicable drawing and shall rotate on the bolt body without binding. When the bolt assembly is in the unlocked position as in the machinegun and the firing pin is held forward against the locking pins in the bolt head, the tip of the firing pin shall be flush with or below the face of the bolt head (cartridge seat). The bolt head subassemblies shall be proof and magnetic particle inspection marked in accordance with the applicable drawings.

3.3.6 Guide bar. The guide bar shall be securely retained on the housing by the screw and spring pin so that there shall be no relative movement.

3.3.7 Housing. The spline nut shall be securely retained in the housing as specified on the applicable drawing so that there shall be no relative looseness.

3.3.8 Housing cover and safing sector. The housing cover and safing sector shall be securely retained on the housing by the quick release pins and shall readily assemble to and disassemble from the housing when the quick release pins are removed. The quick release pins shall readily assemble to and disassemble from their respective positions and when assembled shall remain in position by action of the ball detents.

3.3.9 Identification plate. The identification plate shall be securely attached to the housing by the drive screws so that there shall be no relative movement.

3.3.10 Removable tracks. The removable tracks shall be retained on the rotor assembly by the studs and nuts and shall readily assemble to and disassemble from the rotor assembly without the necessity of loosening the nuts more than two turns. The removable tracks shall retain the bolt assemblies in the trackways of the rotor assembly.

3.3.11 Rotor assembly. The forward and aft gears shall be fastened securely to the rotor by the spring pins as specified on the applicable drawing so that there shall be no relative movement of these parts. The studs shall be threaded into the rotor and secured with the spring pins, oriented with the slots in the forward position, so that there shall be no relative movement of the studs. The bearing shall be lubricated with the lubricant specified on the applicable drawing and shall be retained on the rotor by the forward gear. The rotor assembly shall rotate in the housing without binding. The rotor assembly shall be proof and magnetic particle inspection marked as specified on the applicable drawing.

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3.3.12 Timing pin. The timing pin shall be retained in the housing by the spring pin, shall move through its full range of travel in the housing without binding, and shall be normally returned to and held in the extended position by spring action.

3.3.13 Headspace. The headspace shall be 1.630 inch minimum to 1.641 inch maximum before proof firing and shall be 1.630 inch minimum to 1.642 inch maximum after proof firing as measured from the face of the bolt head (cartridge seat) to a 0.400 inch datum diameter in the barrel chamber.

3.3.14 Breech lock gap. The breech lock gap, measured from the forward stop surface of the bolt head to the rear face of the barrel, shall be not less than 0.004 inch and not more than 0.012 inch before proof firing and shall be not less than 0.004 inch and not more than 0.013 inch after proof firing.

3.3.15 Firing pin indent. The firing pin indent for each firing position of each machinegun taken in soft, annealed, 99.90 percent pure copper compression cylinders, shall not be less than 0.013 inch nor more than 0.025 inch and it shall not be off center more than one-half the diameter of the firing pin indent. Testing shall be as specified in 4.5.3.2 and 4.6.1.

3.3.16 High-pressure resistance. Machineguns shall be capable of withstanding the high-pressure resistance test. Parts shall be free of cracks, seams, and other injurious defects after proof firing as evidenced by examination by visual and magnetic particle process. Testing shall be in accordance with 4.5.3.1 and 4.6.3.

3.3.17 Functioning. Machineguns shall operate without malfunctions or unserviceable parts at both the high rate and low rate of fire. In addition, machineguns shall meet the performance requirements specified in Table I. Unless otherwise specified herein; the steady state rate of fire shall be calculated using the last 50 percent of a 100 round burst, excluding stopping time. Testing shall be in accordance with 4.5.3.1 and 4.6.4.

3.3.18 Targeting and accuracy. At a range of 1,000 inches 80 percent of a 100-round burst fired from the machinegun shall be completely within an 8.0 inch diameter circle to qualify for accuracy; and the center of the 80 percent group shall be within 5.0 inches to the left of or 1.0 inch to the right of and 2.0 inches below or 4.0 inches above the true boresight point to qualify for targeting. Testing shall be in accordance with 4.5.3.1 and 4.6.5.

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Table I. Performance requirements

	Machinegun torque at minimum steady rate of fire.	Acceleration time (from the time of application of current to the drive motor to the time minimum steady state rate of fire is reached).	Steady state rate of fire (average rounds per minute fired).	Stopping time (from the time current is removed from the drive motor until the machinegun comes to a complete stop.)
High rate	180 pound-inches (max.)	0.4 seconds (max.)	6,000 to 6,400	0.2 seconds to 0.5 seconds
Low rate	105 pound-inches (max.)	0.4 seconds (max.)	2,000 to 2,500	0.2 seconds to 0.5 seconds

3.3.19 Endurance. Machineguns shall be capable of withstanding an endurance test of 30,000 rounds with no unserviceable parts and not more than a total of two machinegun malfunctions. In addition, machineguns shall meet the acceleration time, steady state rate, and stopping time requirements specified in Table I. Testing shall be in accordance with 4.6.6.

3.3.20 Interchangeability. Unless otherwise specified on the drawings, all parts shall be interchangeable. (In normal assembly operations there shall be no objections interposed to preferential assembly of parts provided that all parts are dimensionally acceptable.) Machineguns and repair parts shall be capable of meeting the interchangeability tests specified in 4.5.3.4 and 4.6.2.

3.4 Historical record. Upon completion of all inspection, required data shall be entered on DD Form 829, Historical Record for Aeronautical Equipment, and DD Form 829-1, Historical Record - Technical Instructions Compliance Record. One each of the completed forms shall be provided with each machinegun.

3.5 Marking. Each machinegun shall be marked in accordance with the applicable drawings and MIL-W-13855.

3.6 Workmanship. Workmanship shall be in accordance with the workmanship requirements of MIL-W-13855.

#### 4. QAULTY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or order, the supplier may use his own or any other facilities suitable for the performance of inspection requirements herein unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.2 Quality assurance terms and definitions. Quality assurance terms and definitions used herein are in accordance with MIL-STD-109.

4.3 Classification of inspection. The inspection requirements specified herein are classified as follows:

- a. First article (see 4.4).
- b. Quality conformance inspection (see 4.5).

4.4 First article inspection. First article samples shall be selected from early production and submitted for inspection in accordance with contract requirements. The samples shall be representative of the production processes to be used during quantity production. The first article samples shall be subjected to the quality conformance inspection specified herein and such other inspection as is necessary to determine compliance with the requirements of the contract (see 6.1).

#### 4.5 Quality conformance inspection.

4.5.1 Inspection lot. The formation, size, and presentation of inspection lots of machineguns, parts, and packaging shall be in accordance with MIL-STD-105. Inspection lots shall be as large as practicable, in consideration of quality history, manufacturing conditions, and contractor's delivery schedule, and within the limitations of MIL-W-13855. Machineguns shall be assembled from lots of component parts that have met all inspection requirements specified herein. Endurance test lot size shall be as specified in 4.5.3.3.1.

#### 4.5.2 Examination.

4.5.2.1 Component parts and concurrent repair parts. Examination of component parts and concurrent repair parts shall be performed in accordance with the criteria specified in the contract (see 6.1). The contractor's examination of these parts shall be accomplished prior to their assembly into the end item or submission for acceptance as repair parts.

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4.5.2.2 Machineguns. Final examination of each machinegun shall be performed after completion of all testing and just prior to preservation and packaging. Each machinegun shall be examined as specified below. Machineguns failing to meet the requirements shall be rejected. Each step in the examination shall include a visual examination for proper cleaning and presence of the specified protective coating and to determine the general quality, completeness of manufacture, assembly, and workmanship.

4.5.2.2.1 Housing cover and safing sector.

- a. Disassemble the housing cover and safing sector examining for ability to be readily disassembled (see 3.3.8).
- b. Visually examine the housing cover and safing sector to assure freedom from burs, cracks, and mutilations on the cam surfaces.

4.5.2.2.2 Removable tracks.

- a. Disassemble the removable tracks examining for ability to be readily disassembled (see 3.3.10).
- b. Visually examine the removable tracks to assure freedom from burs, cracks, and mutilations.

4.5.2.2.3 Bolt assemblies.

- a. Disassemble the bolt assemblies examining for ability to be readily disassembled (see 3.3.5).
- b. Visually and manually examine retention of the firing pin spring in the firing pin to determine compliance with 3.3.5.
- c. Manually examine free movement of the firing pin in the bolt body and bolt head under spring action to determine compliance with 3.3.5.
- d. Visually and manually examine secure retention of the locking pins to determine compliance with 3.3.5.
- e. Visually and manually examine retention and free rotation of the rollers to determine compliance with 3.3.5.
- f. Visually examine to assure the tip of the firing pin is flush with or below the face of the bolt when in the unlocked position to determine compliance with 3.3.5.
- g. Visually examine the extractor lip on the bolt head to assure freedom from burs, cracks, and mutilations.
- h. Visually examine the bolt head subassembly to assure presence of proof and magnetic particle inspection marks (see Drawing 65B9867).
- i. Visually examine the trackways on the bolt head and bolt body to assure freedom from burs, cracks, and mutilations.
- j. Visually examine the firing pin to assure that the striker point is smooth and free of pits and burs. Visually examine to assure that the firing pin locking shoulders and tang are free of burs, cracks, and mutilations.

#### 4.5.2.2.4 Barrels.

- a. Disassemble the barrel clamp from the barrels and disassemble the barrels from the rotor examining for ability of barrels to be disassembled from the rotor without the use of tools (see 3.3.3.2).
- b. Visually examine the barrels to determine compliance with 3.3.3.1.
- c. Visually examine the barrel locking lugs to assure freedom from burs, cracks, and mutilations.
- d. Visually examine the barrels to assure presence of proof and magnetic particle inspection marks (see Drawing F11701204).

4.5.2.2.5 Aft bearing. Visually and manually examine the aft bearing to determine compliance with 3.3.1.

4.5.2.2.6 Aft gun support. Manually examine the aft gun support to determine compliance with 3.3.2.

#### 4.5.2.2.7 Rotor assembly.

- a. Visually and manually examine the rotor assembly to determine compliance with 3.3.11.
- b. Visually examine the cam tracks and bolt locking surfaces on the rotor assembly to assure freedom from burs, cracks, and mutilations.
- c. Visually examine the rotor assembly to assure presence of proof and magnetic particle inspection marks (see Drawing 65F9877).

#### 4.5.2.2.8 Housing.

- a. Visually and manually examine the housing to determine compliance with 3.3.7.
- b. Visually examine the cam tracks in the housing to assure freedom from burs, cracks, and mutilations.

#### 4.5.2.2.9 Guide bar.

- a. Manually examine the guide bar to determine compliance with 3.3.6.
- b. Visually examine the guide bar to assure freedom from burs, cracks, and mutilations.

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4.5.2.2.10 Identification plate.

- a. Visually and manually examine the identification plate to determine compliance with 3.3.9.
- b. Visually examine the identification plate to assure that all pertinent data has been applied.

4.5.2.2.11 Timing pin. Manually examine the timing pin to determine compliance with 3.3.12.

4.5.2.2.12 Machinegun assembly.

- a. Reassemble the barrels, examining for ability of barrels to be assembled to the rotor without the use of tools (see 3.3.3.2).
- b. Reassemble the barrel clamp and manually examine to determine compliance with 3.3.4.
- c. Reassemble the bolt assemblies and removable tracks examining for ability to readily assemble to the rotor assembly (see 3.3.5 and 3.3.10).
- d. Manually examine bolt assemblies for free movement and function of the firing pin tang in rotor cam path to determine compliance with 3.3.5.
- e. Reassemble the housing cover and the safing sector examining for ability to readily assemble to the housing (see 3.3.8).
- f. Manually examine for secure retention of the housing cover and safing sector to determine compliance with 3.3.8.
- g. Examine for headspace requirement (see 3.3.13), using the inspection equipment in accordance with Drawing D11701600. The spring loaded plug shall be placed in the machinegun and fed into each barrel by manually rotating the barrel cluster until the barrel containing the plug is in the firing position with the bolt locked. The thickness gage shall then be inserted through the housing assembly to check the distance between the plug head and gage body. The headspace is within requirements if the minimum thickness end of the gage enters and the maximum thickness end of the gage does not enter between the plug head and gage body.
- h. Manually rotate the barrel cluster until each bolt assembly in turn is in the firing position and with the bolt head held against the rotor locking shoulder, examine for breech lock gap requirement (see 3.3.14) using feeler gages.
- i. Visually examine the machinegun to assure that all markings prescribed by the drawings have been applied.

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4.5.2.2.13 Visually examine DD Form 829, Historical Record for Aeronautical Equipment; and DD Form 829-1, Historical Record - Technical Instructions Compliance Record, to assure that all pertinent data has been entered.

4.5.2.2.14 Inspection approval stamp. Machineguns which have passed all examinations after successful completion of testing shall be stamped with the Department of Defense complete inspection approval stamp in the area provided on the identification plate. The Government representative will control the stamps used for such stampings to assure successful completion of all required examination and tests.

4.5.2.3 Packaging. Examination of packaging of machineguns shall be performed in accordance with the classification of defects and acceptable quality levels (AQL's) specified in 4.5.2.3.1 (see 6.1). Sample size shall be in accordance with MIL-STD-105, using inspection level I. The following provisions shall apply:

- a. The AQL's are specified as percent defective.
- b. The AQL listed for each defect shall be applied to the individual defect, not to a group of defects.
- c. Examination for packaging defects specified in 4.5.2.3.1 shall apply to each item of the applicable sample of machineguns, interior packages, or exterior containers, as applicable.

4.5.2.3.1 Classification of defects for packaging. (Unless otherwise specified in each listed defect, the packaging requirements are specified on Packaging Data Sheet P65F9877.)

<u>Categories</u>	<u>Defect</u>	<u>AQL</u>
Critical:	None defined.	
Major:		
101	Illegible or incorrect marking.	1.0
102	Inadequate cleaning and drying.	1.0
103	Improper preservative application and drainage.	1.5
104	Improper assembly and closure of package.	1.5
105	Missing DD Forms 829 and 829-1.	1.5
Minor:	None defined.	

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4.5.2.3.2 Examination of packaging of repair parts shall be performed in accordance with the criteria specified in the contract (see 6.1).

#### 4.5.3 Testing.

4.5.3.1 High-pressure resistance, functioning, and targeting and accuracy testing. The contractor shall test each machinegun for high-pressure resistance, functioning, and targeting and accuracy using the test methods specified in 4.6.3, 4.6.4, 4.6.5 respectively. Machineguns failing to meet the requirements shall be rejected. Retests shall be contingent upon analysis and control procedures approved by the Government.

4.5.3.2 Firing pin indent testing. The contractor shall test a sample of three machineguns, selected by the Government representative from each month's production, for firing pin indent using the test method specified in 4.6.1. Failure of any machinegun in the sample to meet the requirement shall cause rejection of the represented lot subject to reconditioning and retest.

#### 4.5.3.3 Endurance testing.

4.5.3.3.1 Lot size. The initial endurance test lot size shall consist of the initial month's production; subsequent endurance test lot sizes shall consist of 100 machineguns. The initial test machinegun shall be taken from the first ten machineguns produced and shall be considered as the test for the initial month's production. When five successive lots meet the requirements, the endurance test lot size shall be increased to 200 machineguns.

4.5.3.3.2 Procedure. One machinegun selected by the Government representative from each endurance lot shall be tested by the contractor for endurance using the test method specified in 4.6.6. The contractor shall provide replacement parts as required to complete the test. If the endurance requirements are not met, the represented lot shall be rejected subject to retest or reconditioning and further test as a reconditioned lot. An endurance retest of another machinegun from the same lot shall be made without reconditioning the represented lot, unless in the opinion of the Government representative the failure indicates serious defects in the item, in which case retest shall be made only if authorized by the procuring agency. Failure of the machinegun in the retest to meet the requirements shall cause rejection of the represented lot subject to reconditioning and further testing as a reconditioned lot. Prior to submission of a lot of machineguns as a reconditioned lot, the cause of failure shall be determined and contractor correction shall be effected on all machineguns in the lot. Sample size and test methods for reconditioned lots shall be the same as for retest.

#### 4.5.3.4 Interchangeability testing.

##### 4.5.3.4.1 In plant.

4.5.3.4.1.1 Machineguns. The contractor shall test a sample of three machineguns randomly selected by the Government representative, from each month's production for interchangeability using the test method specified in 4.6.2.1.1. Machineguns taken for interchangeability testing shall have been found satisfactory in all other examinations and tests. The three machineguns shall be inspected for and shall comply with the requirements for headspace, breech lock gap, and firing pin indent before and after interchange of parts using the inspection methods specified in 4.5.2.2.12(g), 4.5.2.2.12(h), and 4.6.1, respectively. In addition, the machineguns shall be tested for functioning and targeting and accuracy requirement after interchange of parts using the test methods specified in 4.6.4 and 4.6.5 respectively. Failure of the interchangeability test shall cause retest or rejection of the represented lot. At the discretion of the Government representative, and interchangeability retest may be allowed without reconditioning the lot of machineguns. Failure in the retest shall cause rejection of the represented lot subject to reconditioning and further test as a reconditioned lot. A sample of six machineguns from each retest or reconditioned lot shall be tested using the same procedure described above.

4.5.3.4.1.2 Concurrent repair parts. The contractor shall subject at least two parts from each inspection lot of concurrent repair parts to the interchangeability test specified in 4.6.2.1.2. Failure of any part to meet the requirements shall be cause for rejection of the represented lot of parts subject to reconditioning and further test as a reconditioned lot. A sample of double the number of parts used in the original test shall be tested from each reconditioned lot using the test method specified in 4.6.2.1.2.

4.5.3.4.2 Interplant. When machineguns are manufactured concurrently by more than one contractor, each contractor shall forward monthly, to the testing agency specified in the contract, one machinegun for the interplant interchangeability test specified in 4.6.2.2 (see 6.1). The contractor will be informed of the results of the test which indicates failure of the machinegun to meet prescribed requirements.

4.5.3.5 Certification. Unless otherwise specified, the contractor shall be responsible for testing necessary to accomplish certification. For each inspection lot of machineguns, the contractor shall provide the Government representative with certified statements of compliance with applicable drawings and specifications of the following materials and processes specified on Drawing 65F9877.

- a. Plate, identification (65B9926).
- b. Lubricating oil (MIL-L-46150)(see 4.5.4.8).
- c. Touch-up (MIL-W-13855).
- d. Screw, drive, round head (MS21318-20).

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4.5.3.6 Component parts and concurrent repair parts testing. Raw material testing, part testing, and certification shall be performed in accordance with the criteria specified in the contract (see 6.1). This will include chemical analysis and physical tests of materials, and tests of protective finish, heat treatment, bonding, and function of parts as applicable. The contractor shall accomplish these tests prior to assembly of parts into the end item.

4.5.3.7 Packaging testing.

4.5.3.7.1 Machineguns.

4.5.3.7.1.1 The contractor shall furnish the Government representative with certification that the packaging materials conform to the applicable packaging data sheets and specifications.

4.5.3.7.1.2 Determination of cleanliness. The contractor shall test items from each inspection lot for determination of cleanliness using the test method specified in 4.6.7.1. Sampling shall be in accordance with MIL-P-116.

4.5.3.7.1.3 Vacuum chamber. The contractor shall test unit packages from each inspection lot for leakage using the test methods specified in 4.6.7.2. Sampling shall be in accordance with MIL-P-116.

4.5.3.7.2 Repair parts. Testing of packaging of repair parts shall be performed in accordance with the criteria specified in the contract (see 6.1).

4.5.4 Inspection equipment.

4.5.4.1 Acquisition, maintenance and disposition. Unless otherwise specified, responsibility for acquisition, maintenance and disposition of acceptance inspection and test equipment prescribed on lists contained on Index of Equipment List, Drawing IEL11013164 and for all other inspection equipment required to perform inspection prescribed by applicable specifications, shall be in accordance with MIL-I-45607.

4.5.4.2 When specified in the procurement document (see 6.1), copies of drawings of contractor designed inspection equipment shall be forwarded as specified within the contract.

#### 4.5.4.3 Ammunition and links (see 6.1).

4.5.4.3.1 Ammunition. Ammunition used in the high-pressure resistance test shall be as specified in 4.6.3. Ammunition required for all other firing tests shall be Government standard 7.62mm ball cartridges and XML72 inert loaded 7.62mm dummy cartridges as applicable (see 6.1).

4.5.4.3.2 Links. Government standard 7.62mm, M13 links shall be used for linking ammunition (see 6.1).

4.5.4.3.3 Ammunition feeding. A Government standard MAU-56/A de-linking feeder in accordance with MIL-F-45598 shall be used for feeding ammunition to the machinegun (see 6.1).

4.5.4.4 Firing test fixture. All firing test shall be accomplished with the test fixture conforming to F11701814.

4.5.4.5 Drives. Electric drives conforming to Drawing 65C9761 shall be used for test firing machineguns at the high rate of fire and electric drives conforming to Drawing D11686350 shall be used for test firing machineguns at the low rate of fire. Drives shall be calibrated for torque versus speed and torque versus current using the calibration procedure specified on B11701406.

4.5.4.6 Power supply. Power shall be furnished to the drives using a power supply and electric test set conforming to Drawings A11701323 and F11701815 respectively.

4.5.4.7 Recording instrumentation. Instrumentation used for recording the required data shall be an oscillograph conforming to Drawing A11701914.

4.5.4.8 Lubrication. All functioning surfaces of the machinegun, except the ball bearings, shall be coated with lubricating oil conforming to MIL-L-46150. The ball bearings shall be protected against cleaning materials during cleaning operations.

#### 4.6 Test methods.

4.6.1 Firing pin indent test. Machineguns shall be tested for firing pin indent requirement (see 3.3.15) using inspection equipment in accordance with Drawings C7318984, D11701599 and Government standard copper compression cylinder Drawing A39436. The machinegun shall be held in a horizontal position (approximately) and the copper compression cylinder holding fixture containing the copper compression cylinder shall be fed into each barrel chamber by manually rotating the barrel cluster

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in the direction to move the barrel into the battery position releasing the firing pin and indent the copper cylinder. The holding fixture shall then be removed from the barrel and the depth of the indent in the copper cylinder computed by measuring the distance from the original surface of the copper cylinder (before indentation) to the bottom of the firing pin impression. The firing pin indent shall be measured on three copper compression cylinders for each firing position shall be calculated to determine if the requirement has been met. Each indent shall be visually examined to determine if the concentricity requirement has been met. The recorded measured values shall be forwarded in accordance with 6.1.2. After the copper cylinder samples of three consecutive machineguns have been tested without rejection, one copper compression cylinder may be indented for those firing positions where the indentation is at least .001 inch more than the minimum or .001 inch less than the maximum allowed in 3.3.15.

#### 4.6.2 Interchange of parts.

##### 4.6.2.1 In plant.

4.6.2.1.1 Machineguns. Machineguns shall be tested for interchange of parts (see 3.3.20) by disassembling and then reassembling parts using the parts and pre-arranged system specified below. Interchange of parts shall be accomplished by dividing the parts of each machinegun into three groups of non-mating parts as shown below and distributing the groups into three different trays until each tray contains parts for a complete machinegun. Groups of parts from the first machinegun shall be taken in order and placed in trays 1 through 3; groups of parts from the second machinegun shall be taken in order and placed in trays 2, 3 and 1; groups of parts from the third machinegun shall be taken in order and placed in trays 3, 1 and 2. Parts such as screws, nuts, washers and spring pins shall be placed in the same tray as their mating or associate part. Screws, nuts, washers and spring pins rendered unserviceable by disassembly shall be replaced without penalty to the interchangeability test. The machinegun shall be reassembled using only those parts which are in the same tray.

#### Groups of non-mating parts

##### Group I

Bar, guide (65F9809)	Pin, Firing (65F10057)(6 required)
Clamp, barrel, 7.62MM (65D9813)	Pin, timing (65B9762)
Cover, housing (65D9773)	Rotor, gun (65F9769)

Group II

Gear, aft, rotor (65C9752)  
 Gear, forward, rotor (65C9753)  
 Head, bolt subassembly (65B9867)  
 (6 required)  
 Housing, gun, 7.62MM (65F9774)

Stop, spring (63B10878)(6 required)  
 Support, aft gun (65C9750)  
 Track, removable (65C9749)  
 (6 required)

Group III

Barrel, gun: 7.62MM (11701204)  
 (6 required)  
 Bearing, ball, aft (65B9879)  
 Bearing, ball, forward (65B9878)  
 Bolt, subassembly (65B9865)  
 (6 required)

Sector, safing (65F9807)  
 Spring, helical, compression  
 (63B10721)(used with pin,  
 firing - 65F10057 (6 required)  
 Stud (65B9755)(6 required)

4.6.2.1.2 Concurrent repair parts. Concurrent repair parts shall be tested for interchangeability requirement (see 3.3.20) by disassembling two machineguns, previously tested in 4.5.3.4.1.1, as necessary and then reassembling them using the concurrent repair parts. No hand refinement of parts will be allowed, and the machineguns shall operate and function properly. This test may be performed independently of the machinegun interchangeability test specified in 4.5.3.4.1.1, and at more frequent intervals using accepted machineguns taken from current production.

4.6.2.2 Interplant.

4.6.2.2.1 Machineguns. Machineguns to be subjected to the interplant interchangeability test shall be inspected for headspace, breech lock gap, and firing pin indent using the inspection methods specified in 4.5.2.2.12(g), 4.5.2.2.12(h) and 4.6.1 respectively and shall be given a preliminary firing test of 12 rounds of standard ball ammunition to assure proper operation before parts are interchanged. Parts shall then be disassembled from the machineguns and identified as to manufacturer. Disassembled parts shall be mixed and the machineguns shall be reassembled by random selection without altering or hand fitting any part. After assembly, the machineguns shall be inspected for headspace, breech lock gap, firing pin indent, functioning, and targeting and accuracy requirements using the inspection methods specified in 4.3.2.2.12(g), 4.3.2.2.12(h), 4.6.1, 4.6.4 and 4.6.5 respectively. Before machineguns are returned to the contractors, the original parts shall be reassembled to their respective machineguns and the machineguns given a functioning test using a belt of 50 dummy cartridges.

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4.6.2.2.2 Repair parts. The concurrently manufactured repair parts submitted for tests shall be assembled in the machineguns previously tested in 4.6.2.2.1 without hand fitting or altering any part. Machineguns shall be assembled using different combinations of parts to the extent deemed necessary to assure that parts are interchangeable. After assembly, the machineguns shall be tested for functioning and targeting and accuracy requirements using the test methods specified in 4.6.4 and 4.6.5 respectively.

4.6.3 High-pressure resistance test. Machineguns shall be tested for high-pressure resistance requirement (see 3.3.16) by firing one Government standard 7.62mm, M60 high-pressure test cartridge in each barrel after the machineguns have been given the prefiring functioning specified in 4.6.4.1. This proof firing shall be accomplished with the machinegun mounted on the test fixture specified in 4.5.4.4. Barrels and bolt head subassemblies to be assembled into production machineguns shall be proof fired only as part of the completed machineguns and inspected and marked in accordance with the applicable drawings and other applicable documents. Barrels and bolt head subassemblies to be used as repair parts shall be proof fired independently of the production machineguns and inspected and marked in accordance with the applicable drawings and other applicable documents. After proof firing, machineguns shall be visually examined for cracks, deformation, and other evidence of damage and cartridge cases shall be visually examined for bulges, splits, rings, and other defects caused by defective barrels. All parts shall be reassembled to the machineguns from which they were removed and proof marks shall be applied as indicated on the drawings on machineguns that have passed this test.

4.6.4 Functioning test. Testing of machineguns for functioning requirements (see 3.3.17) shall be accomplished using the feeder, test fixture, electric drives, power supply and electric test set, and recording instrumentation specified in 4.5.4.3.3, 4.5.4.4, 4.5.4.5, 4.5.4.6, and 4.5.4.7 respectively, setup and operated in accordance with Drawing B11701405. Ammunition and links shall be in accordance with 4.5.4.3.

4.6.4.1 Prefiring functioning. Prior to function firing and the high-pressure resistance test (see 4.6.3), machineguns shall be manually operated using a 12-round belt of dummy cartridges to assure proper timing and functioning.

4.6.4.2 Functioning firing. After the prefiring functioning test and the high-pressure resistance test, machineguns shall be function fired as specified in 4.6.4.2.1 and 4.6.4.2.2.

4.6.4.2.1 High rate firing test. One 100-round belt of ball cartridges shall be fired to test the machinegun for functioning at high rate. The 100-round belt shall be fired at a steady state rate of 6,000 to 6,400 rounds per minute to test the machinegun for acceleration and stopping time, steady state rate of fire, torque, targeting and accuracy (see 4.6.5), and functioning.

4.6.4.2.2 Low rate firing test. Two 150-round belts of ball cartridges shall be used to test the machinegun at low rate. Each belt shall be fired at a steady state rate of 2,000 to 2,500 rounds per minute to test the machinegun for acceleration and stopping time, steady state rate of fire, torque, and functioning.

4.6.4.3 The recorded measurements for acceleration and stopping time, steady state rate of fire, and torque along with the applied voltage at the drive motor for both the high rate and the low rate firing shall be forwarded in accordance with 6.1.2.

#### 4.6.5 Targeting and accuracy test.

4.6.5.1 Testing of machineguns for targeting and accuracy requirements (see 3.3.18) shall be accomplished using the feeder, test fixture, high rate electric drive, and power supply and electric test set specified in 4.5.4.3.3, 4.5.4.4, 4.5.4.5 and 4.5.4.6 respectively, setup and operated in accordance with B11701405 and using a boresight kit conforming to C11686583. The machinegun shall be boresighted by inserting the boresight in the muzzle end of the barrel in firing position when the machinegun is in each of the six indexed positions. The true boresight point of the machinegun is then determined by the geometrical center of the six boresight points. The boresight shall then be removed and a 100-round belt of ball cartridges fired from the machinegun. The target shall be checked to determine whether the targeting and accuracy requirements have been met. The actual group size and location of center of impact shall be recorded and forwarded in accordance with 6.5.

4.6.5.2 Machineguns may be fired at a range of 2,000 or 3,000 inches provided that suitable correlations, approved by the contracting officer, are made. In addition, if the contractor's range facilities permit, this test shall be fired as part of the functioning test (see 4.6.4).

#### 4.6.6 Endurance test.

4.6.6.1 Testing of machineguns for endurance requirement (see 3.3.19) shall be accomplished using the feeder, test fixture, high rate electric drive, power supply and electric test set, and recording instrumentation specified in 4.5.4.3.3, 4.5.4.4, 4.5.4.5, 4.5.4.6 and 4.5.4.7 respectively, setup and operated in accordance with Drawing B11701405.

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4.6.6.2 Testing shall be accomplished using ball cartridges in belts of 1500 rounds each. The machinegun shall be fired using ten bursts of approximately 150 rounds each at a steady state rate of 6,000 to 6,400 rounds per minute. Acceleration and stopping time, torque, and steady state rate of fire shall be measured and recorded on the last burst of each 1500-round belt. These recorded values shall be forwarded in accordance with 6.1.2.

4.6.6.3 After each 150-round burst the machinegun shall be allowed to cool (without cooling aids) for 5 to 15 seconds. After each 1500-round belt, the machinegun shall be cooled to within 25°F of room temperature (using cooling aids other than water). After each 3000 rounds the machinegun shall be examined and lubricated as necessary. Parts removed from the machinegun during examination shall be replaced in original firing position from which they were removed. Headspace and breech lock gap shall be examined at the start of the test and at the end of the test on the cleaned and unlubricated machinegun. At the end of each day's firing, the machinegun shall be protected against corrosion.

4.6.6.4 No alteration or replacement of parts shall be made unless the parts are either broken or worn to the extent that they are unserviceable. An unserviceable part is one that causes malfunctions or impairs the safety of the machinegun. A complete record shall be kept for each endurance test, showing each malfunction and all parts replaced including the number of the machinegun round at which they occurred.

4.6.6.5 The contractor shall investigate causes of malfunctions and unserviceable parts and indicate corrective action taken.

4.6.6.6 Endurance tested machineguns and parts shall be disposed of as specified in the contract (see 6.1).

#### 4.6.7 Packaging tests.

4.6.7.1 Determination of cleanliness. The applicable surfaces (except for barrel bores and chambers) of each sample unit shall be subjected to the determination of cleanliness test specified in MIL-P-116, except that the wipe test shall not be applicable to parts with black oxide or anodized protective coatings. Barrel bores and chambers shall be wipe tested for cleanliness using clean white bore cleaning swabs.

4.6.7.2 Vacuum chamber. The sample unit packages shall be subjected to the vacuum chamber test specified in MIL-P-116.

## 5. PREPARATION FOR DELIVERY

5.1 Pilot pack. A pilot package shall be forwarded in accordance with the contract (see 6.1). Pilot packages shall be packaged to the level of packaging specified in the contract and packed level C in accordance with the requirements of Packaging Data Sheet P65F9877.

5.2 Preservation, packaging, packing and marking. Machineguns shall be preserved, packaged, packed and marked in accordance with the requirements of Packaging Data Sheet P65F9877.

5.3 Repair parts. Repair parts shall be prepared for delivery in accordance with applicable packaging data sheets as specified in the contract (see 6.1).

## 6. NOTES

6.1 Ordering data. Procurement documents should specify the following:

### 6.1.1 Procurement requirements.

- a. Title, number and date of this specification.
- b. List of drawings and specifications pertinent to the machinegun showing applicable revision dates.
- c. Requirements for and the number of machineguns to be submitted for first article by the contractor (see 3.1 and 4.4).
- d. Criteria for examination of component parts and concurrent repair parts (see 4.5.2.1).
- e. Criteria for examination of packaging of machineguns (see 4.5.2.3) and repair parts (see 4.5.2.3.2).
- f. Criteria for performance of testing of component parts and concurrent repair parts (see 4.5.3.6).
- g. Criteria for testing of packaging of repair parts (4.5.3.7.2).
- h. List of inspection equipment, responsibilities for acquisition, maintenance and disposition of, if other than as specified (see 4.5.4).
- i. Place of final inspection and acceptance (see Notes in MIL-W-13855).
- j. Responsibilities for furnishing ammunition, links, feeders and drives (see 4.5.4.3).
- k. Shipping instructions for machineguns and parts when an inter-plant interchangeability test is required (see 4.5.3.4.2).
- l. When required shipping instructions for copies of contractor designed inspection equipment (see 4.5.4.2).
- m. Disposition instructions of endurance tested machineguns and parts (see 4.5.3.3).
- n. Procedures and methods for disposing of rejected material.

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- o. Disposition of Government furnished property.
- p. That packages opened for examination shall be repackaged by the contractor at the contractor's expense.
- q. Shipping instructions for first article samples and pilot pack (see 3.1 and 5.1).
- r. Selection of applicable levels of preservation, packaging and packing (see 5.2).
- s. Packaging instructions for repair parts.

6.1.2 Contract data requirements. Monthly reports of the results of final examination and functional testing shall be specified for delivery on a DD Form 1423 included in the contract.

6.2 When warranted, the contract should specify the application of MIL-Q-9858 or MIL-I-45208, as appropriate on the Management Control Summary List, DD Form 1660.

6.3 Unless otherwise specified (see 6.1.1 h), the contract should specify the application of MIL-I-45607 and MIL-C-45662 on the Management Control Summary List, DD Form 1660.

6.4 Test firing facilities and operating procedures shall be designed by the contractor in conformance with local, state and federal regulations and suitable for carrying out prescribed firing test with safety of operating and visiting personnel. Copies of these contractor designs shall be forwarded to the contracting officer. Government facilities may be viewed upon application to the contracting officer.

6.5 When action by a testing agency is required, work programing will be affected with the testing agency at the earliest practicable date.

6.6 To avoid delay in test firing, the Government representative should maintain a minimum of two month's supply of high pressure and standard ammunition as determined by anticipated firing requirements.

6.7 Supersession data. This specification includes the requirements of Springfield Armory Purchase Description SAPD-287, Amendment 3, dated 8 March 1967.

Custodian:

Army - WC  
Air Force - 84

Preparing activity:  
Army - WC

Project Number:  
1005-A417

22.

## SPECIFICATION ANALYSIS SHEET

Form Approved  
Budget Bureau No. 22-R255

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. Comments and suggestions submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or serve to amend contractual requirements.

SPECIFICATION MIL-M-45920 Machine Gun, Aircraft 7.62MM: M134 (GAU-2B/A)

ORGANIZATION

CITY AND STATE

CONTRACT NUMBER

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 - Optional)

DATE

DD FORM 1426  
1 JAN 60

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