

MIL-C-20353C (MU)

15 FEBRUARY 1966

SUPERSEDING

MIL-C-20353B (ORD)

11 JANUARY 1955

MILITARY SPECIFICATION**CARTRIDGE, 90MM, CANISTER, M336
LOADING, ASSEMBLING, AND PACKING****1. SCOPE**

1.1 This specification covers the loading, assembling and packing for one type of cartridge designated as Cartridge, 90MM, Canister, for Guns, M36 and M41.

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 this specification to the extent specified herein.

MIL-STD-109 — Quality Assurance
Terms and Definitions

MIL-STD-414 — Sampling Procedures
and Tables for In-
spection by Vari-
ables for Percent
Defective

MIL-
STD-1168 — Lot numbering of
Ammunition

SPECIFICATIONS**MILITARY**

MIL-A-2550 — Ammunition and
Special Weapons;
General Specifica-
tion for

MIL-I-45607 — Inspection Equip-
ment, Supply and
Maintenance of

MIL-
STD-1235 — Single and Multilevel
Continuous Sam-
pling Procedures
and Tables for In-
spection by Attri-
butes

DRAWINGS**ARMY****STANDARDS****MILITARY**

MIL-STD-105 — Sampling Procedures
and Tables for In-
spection by Attri-
butes (ABC-STD-
105)

8796521 — Marking and Sealing
for Ammunition Fi-
ber Containers

8796522 — Marking Diagram
and Sealing for
Wooden Packing
Boxes

FSC 1315

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9214203 — Cartridge, Canister, M336, For 90MM Guns, M36 and M41

9215118 — Box, Packing, Ammunition for Cartridges Canister 90MM, M336 for Guns M36 and M41 in Fiber Container M278 Assembling Details and Packing

9215119 — Ammunition Container, Fiber M278, for Cartridge, Canister, M336 for 90MM Guns, M36 and M41, Assembly Details and Packing

PUBLICATIONS**ARMY**

IEL-9214203 — Index of Inspection Equipment Lists

(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 Material. Materials and parts shall be in accordance with applicable drawings and specifications.

3.2 Cartridges. The cartridges shall comply with all requirements specified on Drawing (dwg.) 9214203 and with all requirements specified in applicable specifications.

3.3 Propellant weight. The weight of the propellant shall not differ by more than plus or minus 0.25 ounce avoirdupois from

that designated by the loading authorization for the particular lot of propellant used.

3.4 Primers. The primers shall have the required number of flash holes as specified on the appropriate primer drawing.

3.5 Bullet pull. The cartridge case shall separate from the projectile at a load of 5,000 plus 6,000 pounds when tested as specified in 4.3.1.

3.6 Proving ground. The cartridge shall comply with the following requirements when tested as specified in 4.3.2.

3.6.1 Functioning. The cartridges shall function satisfactorily as evidenced by metal parts separation of the canister in flight.

3.6.2 Security. (a) There shall be no loss of components or breakup of the canister assembly in the gun bore or muzzle brake as evidenced by damage to the tube or muzzle brake. (b) There shall be no evidence of separation of the base from the body prior to release of the fragments. (c) No component of the canister shall deflect toward the rear of the muzzle.

3.7 Workmanship.

3.7.1 All parts and assemblies shall be fabricated and finished in a thorough, workmanlike manner. All parts shall be free of chips, dirt, grease, rust and other foreign material. The cleaning method shall not be injurious to any of the parts nor shall the parts be contaminated by the cleaning agents.

3.7.2 The painting and marking shall be restored by the assembling contractor on any components furnished to him painted and marked, when such painting and markings have been marred or obliterated.

3.7.3 Rotating bands. Care shall be exercised at all times so that the rotating band

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of the canister is not nicked, burred or otherwise damaged.

4. QUALITY PERFORMANCE

4.1 General quality assurance provisions. 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, the supplier may utilize his own facilities or any commercial laboratory acceptable to 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. Reference shall be made to Standard MIL-STD-109 in order to define terms used herein. The provisions of Specification MIL-A-2550 shall apply.

4.1.1 Submission of product. At the time the completed lot of product is submitted to the Government for acceptance the contractor shall supply the following information accompanied by a certificate which attests that the information provided is correct and applicable to the product being submitted:

- (a) A statement that the lot complies with all of the quality assurance provisions specified within this specification.
- (b) Number of units of product inspected.
- (c) Results obtained, by defect code, for all inspections performed.
- (d) Drawing, specification number and date, together with an identification and date of changes.
- (e) Certificates of conformance on all material purchased by the con-

tractor when such material is controlled by Government or commercial specifications referenced in any of the contractual documents.

(f) Number of items in the lot.

(g) Date submitted.

The certificate shall be signed by a responsible agent of the certifying organization. The initial certificate submitted shall be substantiated by evidence of the agent's authority to bind his principal. Substantiation of the agent's authority will not be required with subsequent certificates unless, during the course of the contract, this authority is vested in another agent of the certifying organization.

4.1.2 Government verification. Using the contractor's written quality assurance procedure, this detail specification, the applicable drawings and other contractual documents as a guide, the Government inspector shall verify at unscheduled intervals all quality assurance operations performed by the contractor. Verification will be performed to the extent necessary to assure compliance with the contractual requirements. Severity of Government inspection of individual characteristics will be directly related to the seriousness of the classification assigned. In no instance will a characteristic classified "critical" be accepted solely on the basis of the contractor's records.

4.2 Inspection provisions.

4.2.1 Lot formation. A lot shall consist of cartridges produced by one manufacturer in one unchanged process, in accordance with the same drawing, same drawing revision, same specification, and same specification revision. Drawing, specification and process changes not affecting safety, performance or interchangeability, as determined by the Government, shall not neces-

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sitate changing the lot interfix number. The examinations and tests listed herein shall be performed on inspection lots submitted in accordance with Standard MIL-STD-105, MIL-STD-414 and MIL-STD-1235, as applicable. The criteria and procedures for the assignment of lot numbers shall be in accordance with Standard MIL-STD-1168. Each lot shall contain:

- (a) Cartridge cases of one type of metal from one manufacturer in accordance with the same drawing and drawing revision, same specification, and specification revision.
- (b) Propellant from not more than one lot.
- (c) Loaded primers of one lot interfix number from one manufacturer.

- (d) Canisters of one lot interfix number from one manufacturer.

4.2.2 Examination. Inspection for Critical defects shall be 100 percent. Sampling plans and procedures for Major and Minor defects shall be in accordance with MIL-STD-105 except that continuous sampling plans in accordance with Standard MIL-STD-1235 may be used if approved by the procuring activity. Also, at the option of the procuring activity, AQL's and sampling plans may be applied to individual characteristics listed using an AQL of 0.65 percent for each Minor defect and an AQL of 0.40 percent for each Major defect. Equipment necessary for the performance of the inspections listed shall be in accordance with 4.2.4.

4.2.2.1 Primer, prior to assembly to cartridge case (see dwg. 8839472 or dwg. 8838153 as applicable, covering a detail of dwg. 9214203):

<i>Categories</i>	<i>Defects</i>	<i>Method of inspection</i>	<i>Code No. (see 6.3)</i>
Critical:			
1.	Any flash hole missing	Visual	01001
Major: None defined.			
Minor: None defined.			

4.2.2.2 Cartridge case, prior to loading propellant (see dwg. 9214203):

<i>Categories</i>	<i>Defects</i>	<i>Method of inspection</i>	<i>Code No.</i>
Critical:			
1.	Primer obviously loose (applicable to M19B1 case)	Manual	02001
Major: AQL 0.40 percent			
101.	Primer fails torque test (applicable to M108 case)	Test	02002
Minor: AQL 0.65 percent			
201.	Foreign matter in interior of case	Visual	02003

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4.2.2.3 Cartridge (see dwg. 9214203):

<i>Categories</i>	<i>Defects</i>	<i>Method of inspection</i>	<i>Code No.</i>
Critical:			
1.	Primer above flush	Gage	03001
Major: AQL 0.40 percent			
101.	Total length, maximum	Gage	03002
Minor: AQL 1.5 percent			
201.	Exterior coating with an aggregate of bare spots in excess of $\frac{1}{4}$ square inch	Visual	03003
202.	Marking missing, misleading or unidentifiable including incorrect color code	Visual	03004
203.	Evidence of poor workmanship (see 3.7)	Visual	03005

4.2.2.4 Unsealed fiber container (see dwg. 9215119):

<i>Categories</i>	<i>Defects</i>	<i>Method of inspection</i>	<i>Code No.</i>
Critical: None defined.			
Major: AQL 0.40 percent			
101.	Packing component missing	Visual	04001
Minor: AQL 1.5 percent			
201.	Cartridge not removable by hand	Manual	04002
202.	Container cap not removable by hand	Manual	04003
203.	Glue or asphalt on cartridge	Visual	04004
204.	Evidence of poor workmanship (see 3.7)	Visual	04005

4.2.2.5 Sealed fiber container (see dwg. 9215119):

<i>Categories</i>	<i>Defects</i>	<i>Method of inspection</i>	<i>Code No.</i>
Critical: None defined.			
Major: AQL 0.65 percent			
101.	Sealing strip incomplete or badly wrinkled	Visual	05001
102.	Container cut or damaged through all impregnated layers ..	Visual-Manual	05002
103.	Metal end loose or distorted	Visual-Manual	05003
Minor: AQL 2.5 percent			
201.	Sealing strip tab length, minimum	Gage	05004
202.	Marking misleading or unidentifiable	Visual	05005

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<i>Categories</i>	<i>Defects</i>	<i>Method of inspection</i>	<i>Code No.</i>
203.	Cuts, scuffs or gouges in outer layer	Visual	05006
204.	Contents loose	Manual	05007
205.	Color of tape incorrect	Visual	05008

4.2.2.6 Sealed wood packing box (see dwg. 9215118) :

<i>Categories</i>	<i>Defects</i>	<i>Method of inspection</i>	<i>Code No.</i>
Critical:	None defined.		
Major:	AQL 1.0 percent		
101.	Box damaged exposing contents	Visual-Manual	06001
102.	Strapping missing, broken or loose	Visual-Manual	06002
103.	Hardware missing, broken or loose	Visual-Manual	06003
104.	Boards loose, broken or nails protruding	Visual-Manual	06004
105.	DOD symbol missing or incorrect	Visual	06005
Minor:	AQL 2.5 percent		
201.	Car seal missing, unsealed or improperly positioned	Visual	06006
202.	Marking misleading or unidentifiable	Visual	06007
203.	Hardware improperly engaged	Visual-Manual	06008
204.	Strapping improperly assembled	Visual-Manual	06009
205.	Handle missing or insecure	Visual-Manual	06010

4.2.3 Testing.

4.2.3.1 Check test for deterioration of primers (see applicable specification) Major defect, Code No. 01002. If the total time between original acceptance of any primer lot and the assembly of that lot into the complete round exceeds two years, or if the primers have been subjected to adverse conditions, however brief, at any time since previous tests, the primer lot shall be subjected to, and must satisfactorily pass, the check test specified in the applicable loading specification immediately before the primer lot is assembled into the cartridges. The test shall be performed by the contractor on primers selected by the Government inspector at the facility assembling the cartridges (see 6.4).

4.2.3.2 Propellant weight (see 3.3), Critical defect, Code No. 07001. The propellant for each charge shall be weighed and check-weighed 100 percent. The check weighing shall be accomplished independently of the original weighing, using a different balance from that used to conduct the original weighing, and, if performed manually, shall be performed by another operator. Any charge which fails to comply with the applicable requirement shall be classed defective and shall be returned to the original weighing station for correction. Equipment shall be in accordance with 4.2.4.

4.2.3.3 Bullet pull (see 3.5), Major defect, Code No. 03006. The sampling plan for this test shall be in accordance with Standard MIL-STD-414, Section B, Part II,

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Table B-3, Code letter F and an AQL of 1.5 percent. The test shall be performed as specified in 4.3.1 with equipment in accordance with 4.2.4.

4.2.3.4 Profile and alignment (see *dwg. 9214203*), Major defect, Code No. 03007. The cartridges shall be gaged in 100 percent for profile and alignment. Any cartridge which fails to meet the applicable requirement shall be classed defective and removed from the lot. Equipment shall be in accordance with 4.2.4.

4.2.3.5 Proving ground. The following tests shall be performed as specified in 4.3.2.

4.2.3.5.1 Function (see 3.6.1), Major defect, Code No. 03008.

4.2.3.5.1.1 Beginning with the first lot produced and continuing until three consecutive lots have complied with the specified criteria, 25 cartridges shall be randomly selected from each lot for this test. If any cartridge fails to comply with the applicable requirement, the lot shall be rejected.

4.2.3.5.1.2 After three consecutive lots have complied with the criteria of 4.2.3.5.1.1, 10 cartridges shall be randomly selected from each lot for this test. If any cartridge fails to comply with the applicable requirement, the lot shall be rejected.

4.2.3.5.2 Security (see 3.6.2) Breakup prior to clearing muzzle brake, Critical defect, Code No. 03009. Other security failure, Major defect, Code No. 030010.

4.2.3.5.2.1 Beginning with the first lot produced and continuing until three consecutive lots have complied with the specified criteria, 15 cartridges shall be randomly selected from each lot for this test. If any cartridge fails to comply with the applicable requirement, the lot shall be rejected.

4.2.3.5.2.2 After three consecutive lots have complied with the criteria of 4.2.3.5.2.1, 5 cartridges shall be randomly selected from each lot for this test. If any cartridge fails to comply with the applicable requirement, the lot shall be rejected.

4.2.3.5.3 Refiring. If for any reason the proof director considers that the test conditions have detrimentally affected the test results, he shall declare the results invalid and perform a new test on additional rounds as required.

4.2.4 Inspection Equipment. Index of Inspection Equipment Lists Number IEL-9214203 identifies the inspection equipment required to perform the examinations and tests prescribed in this section. The contractor shall design inspection equipment in accordance with the instructions in paragraph 6.3.

4.2.4.1 Government rights to documentation. Inspection equipment drawings and lists provided and revised in accordance with the requirements of the IEL may be used by DOD activities for design, procurement, manufacture, testing, evaluation, production and receiving inspection, overhaul, shipping, storage, identification of stock, ordering and storage of replacement parts, inspection of items at overhaul, general maintenance of equipment, construction, survey and whenever inspection equipment drawings are needed.

4.2.4.2 Supply and maintenance. Supply and maintenance of the equipment listed on the IEL shall be in accordance with Specification MIL-I-45607.

4.2.4.3 Government use of contractor's inspection and test equipment. The contractor shall make available to the Government all inspection and test equipment necessary for determining conformance with contract requirements. Personnel for operating the equipment and verification of its accuracy shall be supplied by the contractor for the

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performance of examination or test by the Government.

4.3 Test methods and procedures.

4.3.1 Bullet pull. The security of the cartridge case to canister crimp shall be determined by applying a load in the axial direction at the rate of 0.125 inch per minute using test equipment in accordance with 4.2.4.

4.3.2 Proving ground test. These tests shall be conducted at a Government proving ground in accordance with the applicable Acceptance Test Procedure. The sample cartridges shall be fired in a gun for which the cartridge is standard and observation made for conformance to all applicable requirements (see 6.5 and 6.6). The cartridges used in this test shall be shipped to the proving ground uncrimped.

4.3.2.1 Functioning. The sample cartridges shall be fired with appropriate camera coverage for the purpose of observing the flight of the canister to determine compliance with the applicable requirements. Chamber pressure shall be recorded for information.

4.3.2.2 Security. The sample cartridges shall be fired with propellant adjusted to give 112 percent of the service pressure for the cartridge.

5. PREPARATION FOR DELIVERY**5.1 Preservation and packaging.**

5.1.1 Level A. The cartridge shall be preserved and packaged in accordance with dwg. 9215119 with marking and sealing in accordance with dwg. 8796521.

5.2 Packing.

5.2.1 Level A. The container shall be packed in accordance with dwg. 9215118

with marking and sealing in accordance with dwg. 8796522.

6. NOTES

6.1 Ordering data. Procurement documents shall specify the following:

(a) Title, number and date of this specification.

(b) Ammunition data cards shall be prepared for each lot in accordance with MIL-STD-1167.

6.2 Inspection code numbers. The five digit code numbers assigned to the inspections herein are to facilitate future data collection and analysis by the Government.

6.3 Inspection equipment. The contractor shall design inspection equipment as required by the referenced Inspection Equipment Lists (IEL) in accordance with the instructions of paragraphs 6.3.1 through 6.3.7.

6.3.1 Inspection equipment lists. Inspection equipment lists indicate the availability of inspection equipment designs by showing in the "number" column of the list of inspection equipment (00 Form 1242-3) the numbers of drawings of existing equipment designs or codes as indicated in paragraph 6.3.2. Design action required of the contractor with respect to the different types of drawings that may be listed is described in paragraphs 6.3.3 and 6.3.4. Action required by the contractor with respect to commercial inspection equipment is described in 6.3.5. The contractor will be required to prepare detailed drawings in accordance with 6.3.6 for all the equipment coded as "Contractor Design" in the number column. These contractor designs must be approved by the Government prior to fabrication or procuring of the equipment. Designs shall be submitted for approval as specified in 6.3.7.

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6.3.2 *Inspection equipment list codes.* The inspection equipment as defined in 6.3.3, 6.3.4, 6.3.5 and 6.3.6 will be designed in the IEL by the following codes:

CDAF — Contractor's design responsibility on Army format in accordance with MIL-D-45608.

CDCF — Contractor's design responsibility on contractor format.

AD — Army design.

ADMU — Army design, mandatory for use.

CE — Commercial equipment.

SCD — Specification control drawing.

6.3.3 *Army designs.* Army designs are reflected on detailed drawings which completely depict all the information necessary for the fabrication of the item of inspection equipment. The contractor need provide no design when an Army design is listed for an item of inspection equipment. Army designs fall into two basic classifications, mandatory and nonmandatory. When an inspection equipment list references mandatory Army designs, the contractor shall comply with, and use these designs accordingly. The contractor may, however, in connection with nonmandatory designs and with the approval of the Government, design alternate inspection equipment or use comparable commercial equipment to facilitate his operations. Such contractor prepared designs or commercial equipment selections must be approved by the Government prior to fabrication or procuring of the equipment. Designs shall be submitted for approval as specified in 6.3.7.

6.3.4 *Specification control drawing.* Specification control drawings depict the mini-

mum equipment requirements in outline, descriptive, diagramatic or pictorial form only and specify the required performance or other characteristics. Contractors must prepare detailed drawings (see 6.3.6) of their designs in support of specification control drawings. These contractor prepared designs must be approved by the Government prior to the fabrication or procuring of the equipment. Commercial equipment meeting the requirements of specification control drawings may be approved if described in sufficient detail to permit identification and evaluation by the Government. Designs shall be submitted for approval as specified in 6.3.7.

6.3.5 *Commercial equipment.* Commercial equipment is inspection equipment that has universal application for a specific function. It is comprised of items commonly used by industry and Government. Contractors are not required to furnish drawings of commercial inspection equipment, but a list of such equipment must be approved by the Government. Lists shall be submitted for approval to the inspection element of the agency administering the contract.

6.3.6 *Contractor designs.* Contractor designs are designs of inspection equipment for which the Government has assigned design responsibility to the contractor. Contractor designs shall be supported by detailed drawings which depict all information necessary to completely fabricate, calibrate and operate an item of inspection equipment. This requires that the necessary views, dimensions, materials, finish, notes, operating and calibration instructions be properly depicted in accordance with approved practices to the extent that further calculation or clarification will not be required. Contractor designs identified as CDCF may be developed on the format the contractor normally employs in his equipment design procedure provided such format reflects the detail and information specified above. Contractor designs identified as CDAF shall comply with the format

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and requirements of MIL-D-45608, and in addition, contain the detail and information specified above. Final approved contractor designs identified as CDCF shall be suitable for microfilming. They must be nonreproducible diazo or electrostatic prints of top quality full size with black lines on white background and shall provide a legible print produced via the 35MM microfilm process. Contractors shall submit one copy of the final design as a rolled set or flat set.

6.3.7 Submission of contractor designs. Designs shall be submitted for approval to the Commanding Officer, Picatinny Arsenal, ATTN: SMUPA-ND. Design review will normally be accomplished within one month after receipt by Picatinny Arsenal. Partial submission of inspection equipment designs is permissible and encouraged. However, the Arsenal completion date for design review will be based on the date of the final submission of designs.

6.4 Cost of check tests. The contracting officer will arrange for the contractor to be reimbursed for the expense incurred in the performance of the check test. The test shall be conducted at Government expense without cost to the contractor who loaded the primer or the contractor loading and

assembling the cartridge, and shall not constitute a basis for rejection against either contractor, except where deterioration has occurred as a direct result of carelessness in handling, storage, etc., while the primers were under the jurisdiction of either contractor.

6.5 Combining of proving ground test. When the contractor for the cartridge is also the contractor for one or more of the components thereof, the proving ground tests of the components may be combined with the proving ground tests of the cartridge to save expense, upon agreement between the procuring activity and the contractor. In cases where the cartridge specification does not cover all of the proving ground tests specified for the component, the additional tests specified in the component specification shall be conducted.

6.6 Submission of firing and test data. In addition to the normal distribution of records for each lot of cartridges, when the item is procured by the Department of the Army, copies should be sent to: Commanding Officer, Picatinny Arsenal, ATTN: SMUPA-ND2 (1 copy), SMUPA-DC8 (1 copy), Dover, N. J.

Custodian:

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Preparing activity:

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Project No. 1315-A477

SPECIFICATION ANALYSIS SHEET		Form Approved Budget Bureau No. 119-R004
<p style="text-align: center;">INSTRUCTIONS</p> <p>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.</p>		
SPECIFICATION		
ORGANIZATION		CITY AND STATE
CONTRACT NO	QUANTITY OF ITEMS PROCURED	DOLLAR AMOUNT \$
MATERIAL PROCURED UNDER A		
<input type="checkbox"/> DIRECT GOVERNMENT CONTRACT <input type="checkbox"/> SUBCONTRACT		
<p>1. HAS ANY PART OF THE SPECIFICATION CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE?</p> <p style="margin-left: 40px;">A. GIVE PARAGRAPH NUMBER AND WORDING</p>		
<p style="margin-left: 40px;">B. RECOMMENDATIONS FOR CORRECTING THE DEFICIENCIES</p>		
2. COMMENTS ON ANY SPECIFICATION REQUIREMENT CONSIDERED TOO RIGID		
<p>3. IS THE SPECIFICATION RESTRICTIVE?</p> <p style="margin-left: 40px;"> <input type="checkbox"/> YES <input type="checkbox"/> NO IF "YES", IN WHAT WAY? </p>		
<p>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)</p>		
SUBMITTED BY (Printed or typed name and activity)		DATE

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