INCH POUND
MIL-B-63958(AR)
8 July 1991

MILITARY SPECIFICATION

BOX ASSEMBLY, CONCERTINA CONTROL

FOR WADS

This specification is approved for use by the U.S. Army Armament, Munitions and Chemical Command and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers one type of electronic control box, designated Concertina Control Box Assembly. The concertina control box assembly encloses a concertina subassembly which contains the main operating components. The concertina control box assembly is used in the weapons storage bunkers as part of the WADS program.

2. APPLICABLE DOCUMENTS

2.1 Government Documents.

2.1.1 Specification and standards. The following specifications and standards form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of these documents shall be those listed in the issue of the Department of Defense Index of Specification and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.2).

SPECIFICATIONS

MILITARY

MIL-A-48078 - Ammunition Standard Quality Assurance Provisions, General Specification for

(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Standardization Document Order Desk, Bldg. 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document, should be addressed to: Commander, U.S. Army ARDEC, ATTN: SMCAR-BAC-S, Picatinny Arsenal, NJ 07806-5000 by using the self addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A FSC-8140

2.1.2 Other Government documents, drawings and publications. The following other government document forms a part of this specification to the extent specified herein. Unless otherwise specified, the issues shall be those in effect on the date of the solicitation.

PRODUCT DRAWINGS

U.S. ARMY ARMAMENT RESEARCH, DEVELOPMENT AND ENGINEERING CENTER

9381544 - Concertina Subassembly.
9381545 - Box Assembly, Concertina Control
9387069 - Connector-terminal Assembly.

SPECIFICATIONS

U.S. ARMY ARMAMENT RESEARCH, DEVELOPMENT AND ENGINEERING CENTER

QAP 12599490 - Relay, CCB-K1

PACKAGING DATA SHEETS

U.S. ARMY ARMAMENT RESEARCH, DEVELOPMENT AND ENGINEERING CENTER

P9381545 - Box Assembly, Concertina Control

(Copies of drawings, and publications required by manufacturers in connection with specific acquisition functions, should be obtained from the contracting activity or as directed by the contracting officer.)

2.2 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, the text of this specification shall take precedence. Nothing in this specification, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Materials and components. Materials shall conform to applicable specifications and drawings. Each component shall conform to all dimensions and tests specified on the component drawing. The contractor shall have available verifiable proof (i.e., objective evidence (see 6.3)) that materials under components were fabricated, inspected, and tested under controllable conditions as set forth in the contractor's quality control or inspection procedures.

3.2 Assembly. The box assembly shall comply with all requirements specified on drawing (dwg.) 9381545, with all requirements specified herein, and with the requirements of applicable specifications to the extent specified on the drawingsand herein.

3.3 First article. When specified, two box assemblies shall be subjected to first article inspection (see 4.3 and 6.2).

3.4 Continuity.

3.4.1 Box assembly. Continuity of the concertina control box assembly shall exist between connected terminals as indicated in Table I. Testing shall be as specified in 4.5.1.

TABLE I. Continuity

Control Box Terminal Block Connector		
From	To	Resistance - ohms
1	2	830 ± 83
7	6	open
3	5	open
10	5	open
4	Grnd	0.5 Max
8	9	0.5 Max
11	12	0.5 Max

3.4.2 Concertina subassembly. Continuity of the concertina subassembly shall exist between connected terminals as indicated in Table II and the resistance shall not exceed 0.5 ohm, except where noted. Testing shall be as specified in 4.5.1.

TABLE II. Continuity

Concertina Subassembly

Component Terminal		Component Terminal	
From	To	From	To
P1-1	K1-3	K2-2	K3-2
P1-4	K1-9	K2-3	K2-6
P1-6	Ground	K2-7	T2-1
P1-8	K1-2	K2-8	T2-2
P1-9	K1-1	K2-8	T1-3
P1-11	K3-8	K3-2	T2-3
P1-13	K3-1	K3-2	T3-3
P1-15	K1-10	K3-6	PS-1
K1-1	K2-2	K3-7	T3-1
K1-3	K2-3	K3-8	T3-2
K1-4	K3-6	K3-8	PS-2
K1-5	T1-1	K3-8	C1
K1-8	K3-3	K1-1	K2-8*
K1-11	K2-1	K2-2	C1 **
K2-2	C1	K3-8	C1 **

*Resistance = 10 ± 1K ohms
**Capacitance = 1 ± 0.1 microfarads

3.5 Functioning test. When a momentary pulse of 28 ± 4 VDC is applied to the lockout input, TB1-1 and TB1-2, the concertina control box assembly shall be inactivated for a delay period of 30 ± 2 minutes as evidenced by lack of continuity between TB1-6 and TB1-7. During this 30-minute delay period, the enable relay shall be incapable of being energized when the pressure switch is activated as evidenced by the enable indicator not being lit. Part of this test shall be repeated at the end of the 30-minute delay period to ensure that the enable relay can be activated and stays activated for a period of 10 ± 2 minutes. Testing shall be as specified in 4.5.2.

3.6 High temperature. The concertina control box assembly shall withstand a high temperature of 105° ± 5°F, for a minimum period of 6 hours without evidence of deterioration or damage that may impair its intended operation. While at the high temperature (at the end of the high-temperature exposure period), the concertina control box assembly shall comply with the requirements of 3.5. Testing shall be as specified in 4.5.4.

3.7 Low temperature. The concertina control box assembly shall withstand a low temperature of 0° ± 5°F, for a minimum period of 6 hours without evidence of deterioration or damage that may impair its intended operation. While at the low temperature (at the end of the low-temperature exposure period), the concertina control box assembly shall comply with the requirements of 3.5. Testing shall be as specified in 4.5.4.

3.8 Serialization. A serial number shall be assigned by the contractor to each unit produced. In no event shall serial numbers be duplicated.

3.9 Workmanship. All parts and accessories shall be constructed, assembled, and finished in a thoroughly workmanlike manner. Particular attention shall be given to neatness, marking, cleaning, and freedom of the parts from burrs and sharp edges which may affect performance or result in injury during handling. 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.

4. QUALITY ASSURANCE PROVISIONS

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

4.1.1 Responsibility for compliance. All items shall meet all requirements of section 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

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

a. First article inspection (see 4.3)

b. Quality conformance inspection (see 4.4)

4.3 First article inspection.

4.3.1 Submission. Where the contract requires first article inspection, the contractor shall submit two consecutively produced concertina control box assemblies to the testing facility designated in the invitation for bids or request for proposal.

4.3.2 Inspection to be performed. The first article inspection samples shall be inspected for the defects specified in 4.4.2.1, using inspection methods contained therein, and for all the requirements of Section 3, a applicable. The concertina control box assembly test requirements of Section 3 are listed in Table III, and the tests shall be performed in the listed sequence. Each item shall be tested with the methods of inspection specified in 4.5. Inspection shall be performed with the acceptance inspection equipment specified in 4.4.4. Should any item fail to comply with any of the applicable requirements, the first article samples shall be rejected. The Government reserves the right to terminate its inspections upon any failure of the first article samples to comply with the stated requirements. This series of tests listed in Table III are not considered destructive.

TABLE III. First article tests.

Test	Requirement paragraph
a. Continuity	3.4.1
b. Functioning test	3.5
c. High temperature	3.6
d. Low temperature	3.7

4.4 Quality conformance inspection.

4.4.1 Inspection lot. A lot or batch and its formation, size and presentation is described in MIL-A-48078. Accordingly, a lot shall mean an inspection lot, and a batch shall mean an inspection batch for the purposes of this specification. The manner in which each inspection lot or batch is to be presented and identified by the contractor shall be designated or approved by the Government representative.

4.4.2 Product inspection examinations. A sample shall be selected at random from each inspection lot in accordance with Table III for inspection of major and minor defects, as applicable. If one or more defects is found in the sample selected for either major or minor inspections, the lot shall be rejected. The sequence of inspections for the classification of defects need not be followed so long as all the defect inspections are performed. The term, "SMTE", where used, shall mean any standard measuring and test equipment suitable for the test being performed.

TABLE IV. Inspection lot sampling.

Major defects		Minor defects	
Lot size	Sample size	Lot size	Sample size
1-5	all	1-5	all
6-10	5	6-10	4
11-15	10	11-15	8
16-25	15	16-25	11
26-35	22	26-35	14
36-50	26	36-50	16
51-70	30	51-70	18
71-100	33	71-100	19
101 and over	37	101 and over	20

4.4.2.1 Classification of defects. Critical, major, and minor defects are defined in MIL-A-48078.

QUALITY CONFORMANCE INSPECTION

CLASSIFICATION OF CHARACTERISTICS

MIL-B-63958 (AR)

PARAGRAPH	TITLE	SHEET	DRAWING NUMBER
4.4.2.1.1	Concertina terminal assembly	1 OF 1	9387069
			NEXT HIGHER ASSEMBLY

CLASSIFICATION	EXAMINATION OR TEST	CONFORMANCE CRITERIA	REQUIREMENT PARAGRAPH	INSPECTION METHOD REFERENCE
Critical	None defined.			
Major:				
101.	Any part missing, damaged, improper or improperly assembled	Table IV	3.2	Visual
102.	Terminal board continuity, 0.50 ohm max. improper	Table IV	3.2	SMTE
103.	Overall length, improper	Table IV	3.2	SMTE
Minor:				
201.	Evidence of poor workmanship	Table IV	3.9	Visual

NOTES:

AMSMC Form 1570b, 1 Jul 89 Replaces 1570, 1 Feb 85, which may not be used.

PARAGRAPH	TITLE	SHEET	DRAWING NUMBER
4.4.2.1.2	Concertina subassembly	1 OF 1	9381544
			NEXT HIGHER ASSEMBLY

CLASSIFICATION	EXAMINATION OR TEST	CONFORMANCE CRITERIA	REQUIREMENT PARAGRAPH	INSPECTION METHOD REFERENCE
Critical	None defined.			
Major:				
101.	Any missing, damaged, improper, or improperly assembled	Table IV	3.2	Visual
102.	Continuity (see Table II) improper	Table IV	3.4	SMTE
103.	Objective evidence that relay (K1) conforms to QAP 12599490	Table IV	6.3	Visual
104.	Overall length, improper	Table IV	3.2	SMTE
Minor:				
201.	Scratches on protective finish exposing metal	Table IV	3.2	Visual
202.	Serial number marking missing, improper or illegible	Table IV	3.2	Visual
203.	Evidence of poor workmanship	Table IV	3.9	Visual

NOTES:

QUALITY CONFORMANCE INSPECTION
CLASSIFICATION OF CHARACTERISTICS

MIL-B-63958 (AR)

PARAGRAPH	TITLE	SHEET	DRAWING NUMBER
4.4.2.1.3	Concertina control box assembly	1 OF 1	9381545
			NEXT HIGHER ASSEMBLY

CLASSIFICATION	EXAMINATION OR TEST	CONFORMANCE CRITERIA	REQUIREMENT PARAGRAPH	INSPECTION METHOD REFERENCE
Critical	None defined.			
Major:				
101.	Any part missing, damaged, improper, or improperly assembled (including concertina subassembly, connector terminal assembly, bullet hubs (3), neon indicator, and switch hose assembly)	Table IV	3.2	Visual
Minor:				
201.	Scratches on protective finish (exposing base metal)	Table IV	3.2	Visual
202.	Evidence of poor workmanship	Table IV	3.9	Visual

NOTES:

AMSMC Form 1570b, 1 Jul 89 Replaces 1570, 1 Feb 85, which may not be used.

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4.4.3 Quality conformance inspection testing. The contractor shall perform all of the tests specified in Table IV. The tests shall be performed in the listed sequence. These tests are not considered destructive, and samples so tested shall be returned to the lot.

TABLE IV. Quality conformance tests.

Test	Test Classification
a. Continuity	Minor
b. Functioning test	Major

4.4.3.1 Continuity (see 3.4) and functioning test (see 3.5). Each concertina control box assembly shall be subjected to these tests (see applicable paragraph in 4.5). If any concertina control box assembly/subassembly fails to comply with the applicable requirements, it shall be classified defective and be removed from the lot.

4.4.4 Acceptance inspection equipment.

4.4.4.1 Major defects and tests. Inspection shall be performed with the acceptance inspection equipment, operating instructions, and calibration procedures designed or specified by the contractor. The contractor shall obtain approval of such equipment designs, operating instructions, and calibration procedures prior to use on the contract (see 6.4).

4.4.4.2 Minor defects. The acceptance inspection equipment, operating instructions, and calibration procedures used by the contractor for minor classification inspection shall be approved by the Government representative responsible for acceptance inspection.

4.5 Methods of inspection. The tolerances specified in this specification are absolute with no allowance for test equipment inaccuracy. The tolerances used by the manufacturer shall be equal to the absolute tolerances less the accuracy tolerances of the test equipment used. Unless otherwise specified, the tests shall be conducted at room temperature (77° ± 10°F).

4.5.1 Continuity. Continuity shall be measured using a Government-approved continuity tester for compliance with the requirements of 3.4.

4.5.2 Functioning test. The functioning test shall be performed using the following test methods:

1. The functioning test shall be performed, with the concertina subassembly installed in the concertina control box assembly, in the following suggested sequence.

   a. Connect 220 ± 15 VAC, 50/60 Hz between TB1-5 and TB1-10. Ground the concertina control box assembly by connecting TB1-4 to electrical ground.

   b. Simultaneously apply a momentary 28 VDC pulse to TB1-1(+) and TB1-2(-). An audible click will indicate the start of the 30 minute delay period. Measure period with an approved time measuring device.

   c. Apply momentary pulse of dry air/nitrogen, regulated to a pressure of 55 ± 5 psig, to the air valve fitting on top of the concertina control box enclosure (to actuate the pressure switch).

   d. Ensure that the enable indicator light, on the bottom of the concertina control box enclosure, is off and that no continuity exists between TB1-6 and TB1-7.

   e. Audible click of the K1 relay shall indicate the end of the 30 ± 2 minute delay period requirement.

   f. Repeat step (c) and start monitoring a 10 ± 2 minute delay period with an approved time measuring device.

   g. During the delay period, the enable indicator light shall be on and there shall be continuity between TB1-6 and TB1-7.

   h. The enable indicator light shall go off at the end of the 10 ± 2 minute delay period and there shall be no continuity between terminals TB1-6 and TB1-7.

   i. Remove input power.

The concertina control box assembly shall comply with the requirements of 3.5 during this test.

4.5.3 High temperature. Before performing this test, close and fasten the enclosure door. The concertina control box assembly shall be placed into a test chamber, and the temperature of the chamber shall be raised to 105° + 5°F. The concertina control box assembly shall remain at this temperature for a minimum period of 6 hours, and it shall then be tested as specified in 4.5.2 while at the high temperature. The concertina control box assembly shall comply with the requirements of 3.6 during this test.

4.5.4 Low temperature. Before performing this test, close and fasten the enclosure door. The concertina control box assembly shall be placed into a test chamber, and the temperature of the chamber shall be lowered to 0° + 5°F. The concertina control box assembly shall remain at this temperature for a minimum period of 6 hours, and it shall then be tested as specified in 4.5.2 while at the low temperature. The concertina control box assembly shall comply with the requirements of 3..7 during this test.

5. PACKAGING

5.1 Preservation, packaging, packing, and marking. The box assembly shall be preserved, packaged, packed, and marked in accordance with P9381545 or as specified in the contract or purchase order.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful but is not mandatory.)

6.1 Intended use. The box assemblies covered by this specification are intended for use in the weapon access delay systems.

6.2 Acquisition requirements. Acquisition documents should specify the following:

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

b. Type of box assembly being procured, part number and nomenclature.

c. Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1.1 and 2.1.2).

d. When first article is required (see 3.3).

e. Applicable methods of packaging and packing (see 5.1).

6.3 Objective evidence.

6.3.1 General. Contractors inspection records and documents verifying compliance with applicable dwg. and specification requirements.

6.3.2 Materials. A statement (certification), supported by test data, that all materials produced or purchased by the contractor meets all requirements when such material is controlled by the government or commercial specification referenced in contractual documents.

6.4 Acceptance inspection equipment. The contractor shall obtain approval of equipment designs, operating instructions, and calibration procedures from Commander, U.S. Army Armament, Research, Development and Engineering Center, ATTN: AMSMC-QAN-I(D), Picatinny Arsenal, NJ 07806-5000. This address will be specified on the Contract Data Requirements List, DD Form 1423 in the contract.

6.5 Subject term (key word) listing.

Key box assembly	Acceptance equipment
Encoder	Pneumatic logic
Manifold	Functional gage

Custodian:
Army-AR

Preparing activity:
Army-AR

(Project 8140-A830)

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

I RECOMMEND A CHANGE:	1. DOCUMENT NUMBER	2. DOCUMENT DATE (YYMMDD)
	MIL-B-63958 (AR)	8 July 1991

3. DOCUMENT TITLE: BOX ASSEMBLY, CONCERTINA CONTROL FOR WADS

4. NATURE OF CHANGE *(Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets if needed.)*

5. REASON FOR RECOMMENDATION

6. SUBMITTER

a. NAME (Last, First, Middle Initial)	b. ORGANIZATION	
c. ADDRESS (Include Zip Code)	d. TELEPHONE (Include Area Code) (1) Commercial (2) AUTOVON (If applicable)	7. DATE SUBMITTED (YYMMDD)

8. PREPARING ACTIVITY

a. NAME	b. TELEPHONE (Include Area Code)	
Commander US Army ARDEC	(1) Commercial 724-6675	(2) AUTOVON 880-6675
c. ADDRESS (Include Zip Code) ATTN: SMCAR-BAC-S Picatinny Arsenal, NJ 07806-5000	IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT: Defense Quality and Standardization Office 5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041-3466 Telephone (703) 756-2340 AUTOVON 289-2340	