

INCH POUND
MIL-C-63959(AR)
8 July 1991

MILITARY SPECIFICATION
CONCERTINA SUBASSEMBLY 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 electronics assembly designated Concertina Subassembly. The concertina subassembly is component of the concertina blanket used in 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.

AMSMC N/A

FSC-8140

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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 issue 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

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

P9381544 - Concertina Subassembly

(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 and components were fabricated, inspected, and tested under controllable conditions as set forth in the contractor's quality control or inspection procedures.

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3.2 Assembly. The concertina subassembly shall comply with all requirements specified on drawings (dwg.) 9381544, with all requirements specified herein, and with the requirements of applicable specifications to the extent specified on the drawings and herein.

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

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

TABLE I Continuity

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, P1-8 (+) and P1-15 (-), the concertina subassembly shall be inactivated for a delay period of 30 + 2 minutes as evidence by lack of continuity between P1-4 and P1-13. During this 30-minute delay period, the enable relay shall be incapable of being energized when the pressure switch is actuated. 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 stay activated for a period of 10 + 2 minutes. Testing shall be as specified in 4.5.2.

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3.6 High temperature. The concertina subassembly shall withstand a high temperature of $105^{\circ} \pm 5^{\circ}\text{F}$, 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 subassembly shall comply with the requirements of 3.5. Testing shall be as specified in 4.5.3.

3.7 Low temperature. The concertina subassembly shall withstand a low temperature of $0^{\circ} \pm 5^{\circ}\text{F}$, 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 subassembly 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 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 the inspection requirements specified 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 ensure supplies and services conform to prescribed requirements.

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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. When the contract requires first article inspection, the contractor shall submit two consecutively produced concertina subassemblies to the testing facility designated in the invitation for bids or request for proposal.

4.3.2 Inspection and testing to be performed. The first article inspection sample 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. The test requirements of Section 3 are listed in Table II and the concertina subassemblies shall be tested using the methods of inspection specified in 4.5. Inspection and testing 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 II, are not considered destructive.

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TABLE II. First article tests.

Test	Requirement paragraph
a. Continuity	3.4
b. Functioning	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 examination. 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 inspection are performed. The term, "SMTE," where used, shall mean any standard measuring and test equipment suitable for the test being performed.

TABLE III. 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

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PARAGRAPH	TITLE	SHEET 1 OF 1		INSPECTION METHOD REFERENCE
		DRAWING NUMBER	REQUIREMENT PARAGRAPH	
4.4.2.1.1	Concertina Subassembly	9381544		NEXT HIGHER ASSEMBLY
CLASSIFICATION	EXAMINATION OR TEST	CONFORMANCE CRITERIA	REQUIREMENT PARAGRAPH	INSPECTION METHOD REFERENCE
<u>Critical</u>	None defined.	.		
<u>Major:</u> 101.	Any part of missing, damaged, improper or improperly assembled.	Table III	3.2	Visual
102.	Objective evidence that Relay (K1) conforms to QAP 12599490	Table III	6.3	Visual
<u>Minor:</u> 201.	Scratches on protective finish (exposing base metal)	Table III	3.2	Visual
202.	Serial number marking missing improper, or illegible	Table III	3.2	Visual
203.	Evidence of poor workmanship	Table III	3.9	Visual

NOTES:

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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 Major defects and tests. Inspection and testing 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).

4.4.3.2 Minor defects and tests. 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 tests equipment inaccuracy. The tolerances used by the manufacturer shall be equal to the absolute tolerances less than accuracy tolerances of the test equipment used. Unless otherwise specified, the tests shall be conducted at room temperature ($77^{\circ} \pm 10^{\circ}\text{F}$).

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 Function. The function test shall be performed using the following test method:

- a. Apply 220 ± 15 VAC, 50/60 Hertz between P1-1 and P1-9, and ground to P1-6.
- b. Simultaneously, apply a momentary (3 ± 1 SEC) 28 ± 4 VDC pulse to P1-8 (+) and P1-15 (-), and commence to monitor the subsequent 30 ± 2 minute delay period.

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- c. Actuate the pressure switch by applying a momentary pulse of dry air/nitrogen (regulated to a pressure of 55 ± 5 psig) to the switch base (9381537).
- d. Using an approved voltmeter, ensure that no voltage exist between P1-11 and P1-9, and no continuity exists between P1-4 and P1-13.
- e. The end of the delay period shall be indicated by the K1 relay returning to its normal position as evident by an audible click. The delay period shall be measured as 30 ± 2 minutes.
- f. Repeat step c, and commence to monitor the subsequent 10 ± 2 minute delay period. Verify that 220 ± 15 VAC exist between P1-11 to P1-9 and continuity between P1-13 to P1-4.
- g. After the 10 ± 2 minute delay period there shall be no voltage between P1-11 to P1-9 and no continuity between P1-13 to P1-4.

The concertina subassembly shall comply with the requirements of 3.5 during this test.

4.5.3 High temperature. The concertina subassembly shall be placed into a chamber, and the temperature of the chamber shall be raised to $105^\circ \pm 5^\circ \text{F}$. The concertina subassembly 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 subassembly shall comply with the requirements of 3.6 during this test.

4.5.4 Low temperature. The concertina subassembly shall be placed into a test chamber, and the temperature of the chamber shall be lowered to $0^\circ \pm 5^\circ \text{F}$. The concertina subassembly 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 subassembly 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 P9381544 or as specified in the contract or purchase order.

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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 concertina subassemblies 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 concertina subassembly 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 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.

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
MIL-B-63959 (AR)

2. DOCUMENT DATE (YYMMDD)
8 July 1991

3. DOCUMENT TITLE

CONCERTINA SUBASSEMBLY 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)

7. DATE SUBMITTED
(YYMMDD)

(1) Commercial

(2) AUTOVON
(if applicable)

8. PREPARING ACTIVITY

a. NAME

Commander
US Army ARDEC

b. TELEPHONE (Include Area Code)

(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