

THE SCIENCE



OF SURVIVAL

COBHAM

Product Support Manual

ACR/EM-2BA™

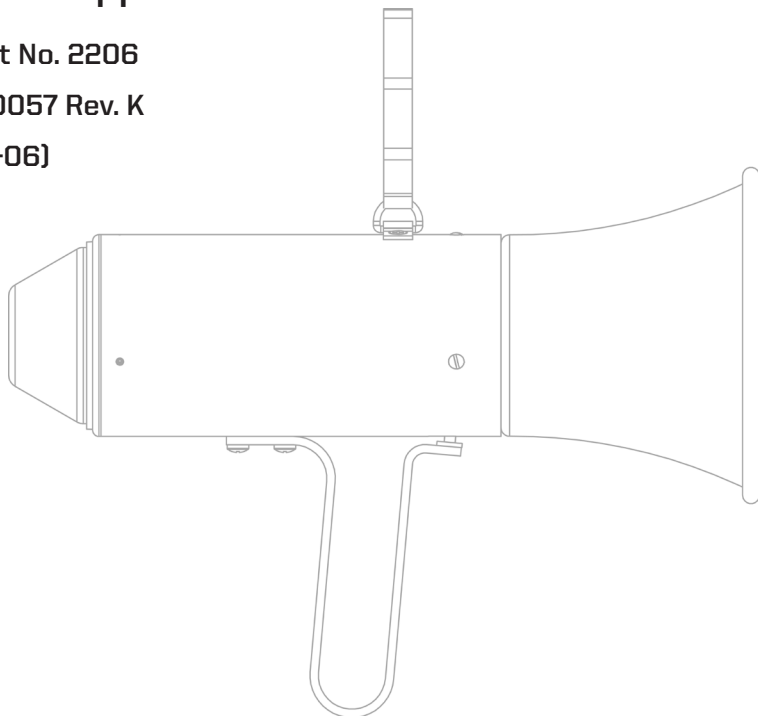
Portable Safety Megaphone

FAA PMA Approved under A3-06-1405-

Product No. 2206

Y1-03-0057 Rev. K

(25-60-06)



The technical data in this document (or file) is controlled for export under the Export Administration Regulations (EAR), 15 CFR Parts 730-774, ECCN: EAR99. Violations of these laws may be subject to fines and penalties under the Export Administration Act.

ACR Electronics, Inc. // 5757 Ravenswood Road // Fort Lauderdale // FL // 33312-6645

Tel: +1 (954) 981-3333 // Fax: +1 (954) 983-5087 // www.acrelectronics.com

REV	DESCRIPTION	DATE	APVD.
D	Modify assembly & disassembly notes, add new part numbers to spare parts list for new design.	5/13/99	T. Martin
E	Assign 4-digit codes to spare parts.	12/8/99	L. Subrattee
F	Added FAA approval information to front cover.	4/27/04	T. Martin
G	Update to add revision table and updated formatting.	2/7/08	T. Martin
H	Updated for rebranding	4/3/09	T. Martin
J	Updated to add export admin regulation statement	11/24/09	T. Martin
K	Updated to make product references more consistent.	1/15/10	T. Martin



**IF YOU HAVE ANY TROUBLE WITH
YOUR NEW MEGAPHONE, DO NOT RETURN
IT TO THE STORE!
CALL ACR ELECTRONICS AT
+1 (800) 432-0227. WE WILL HELP YOU
RESOLVE ANY PROBLEMS YOU MAY BE
EXPERIENCING. MANY QUESTIONS CAN BE
ANSWERED OVER THE PHONE.**

TABLE OF CONTENTS

SECTION 1 – DESCRIPTION	4
SECTION 2 – OPERATION	4
SECTION 3 – MAINTENANCE	5
3.1 Cleaning	5
3.2 Battery Replacement	5
SECTION 4 – TESTING, TROUBLESHOOTING & REPAIR	5
4.1 Testing	5
4.2 Repair	6
SECTION 5 – DISASSEMBLY & ASSEMBLY	6
5.1 Disassembly	6
5.2 Assembly	6
SECTION 6 – PARTS LIST	7
SECTION 7 – TECHNICAL DATA	8
APPENDIX - WARRANTY, USEFUL LIFE, NOTICES	9
A.1 Limited Warranty	9
A.2 Useful Life Policy	9
A.3 Notices	9

SECTION 1 – DESCRIPTION

The ACR/EM-2BA is a battery operated solid state megaphone specifically developed for use in enclosed areas such as in the interior of an aircraft or ship cabin. It has been designed to minimize regenerative acoustic feedback that results in whistling and other oscillations of this nature. It has a 90° sound projection angle to direct the sound to persons in its immediate vicinity, as well as in the rear sections of any aircraft. The amplifier frequency band-pass has been selected to produce a crisp, clear reproduction of voice signals. The operating power level is also sufficient to provide adequate sound under high ambient noise level conditions without being over-powering. Specific attention has been given to the physical size so that it can be used effectively in a crowded environment.

The integrated circuit amplifier only uses a small current when turned "ON". This extends the life of the batteries so that several hours of operation may be expected when used normally in an intermittent manner. A simplified block diagram of the megaphone is shown in Figure 1 (shown below).

A battery test circuit is included. A flashing green LED indicates that the battery is Ok.

SECTION 2 – OPERATION

To test the battery, squeeze the handle and note if the green LED (located near the volume control cap) is flashing. The batteries are useable as long as the LED flashes.

Hold the megaphone in one hand. Place mouth almost in contact with the microphone mouthpiece at the rear of the assembly. Squeeze the handle, which will flex slightly, turning the megaphone "ON" and speak slowly with loud, crisp, clear tones.

Adjust the volume control knob to a suitable sound level. The volume control may be adjusted by removing the hole plug (4) and turning the potentiometer shaft inside the unit.

When not in use, carry the megaphone by the neck strap, attached to top of unit.

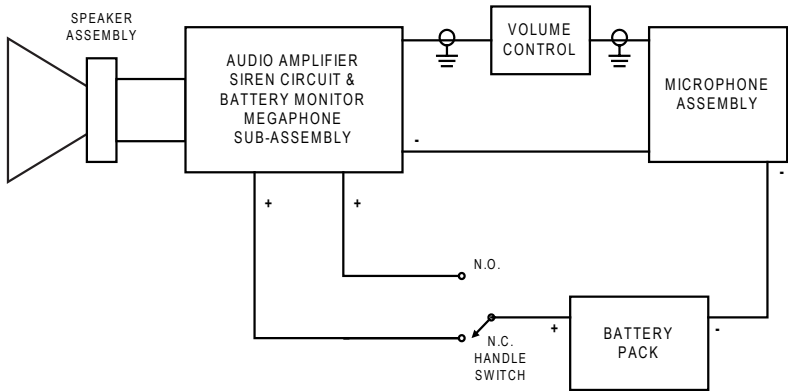


FIGURE 1
BLOCK DIAGRAM
ACR/EM-2BA PORTABLE SAFETY MEGAPHONE

SECTION 3 – MAINTENANCE

3.1 Cleaning

External surfaces of the megaphone may be cleaned with a soft cloth, dampened in a solution of mild household detergent. Do not immerse in water or use strong solvents. Clean electrical contacts with cloth dampened with isopropyl alcohol.

3.2 Battery Replacement

The power supply used in the megaphone consists of six standard 1 ½ volt “AA” size batteries. Current drain is minimal (12 mA) with the megaphone “ON”, and increases when the user speaks into the microphone.

Battery replacement is accomplished by removing three set screws (2) while holding the microphone and mouthpiece assembly (1) in place. The six cells, contained in three tubes with two cells per tube, are immediately accessible and will drop out when the megaphone is tilted. New batteries may be dropped into the tubes, observing polarity marking adjacent to each tube.

Replace microphone and mouthpiece assembly (1). Align keyway and secure with the three set screws (2).



CAUTION: Observe polarity of cells carefully before replacement.

SECTION 4 – TESTING, TROUBLESHOOTING & REPAIR

Note: The megaphone consists of three major assemblies; the microphone and mouthpiece assembly, the megaphone sub-assembly, and the horn and speaker assembly. To locate a defect, follow the procedure outlined below:

4.1 Testing

1. Squeeze the handle. If a clicking sound is heard, the speaker is operating.
2. If no sound is heard, remove the microphone and mouthpiece assembly and the batteries. Check that both the microphone and battery contacts are clean. If not, clean with a mild, non-abrasive cleaner such as alcohol.
3. Test amplifier and speaker assembly by replacing the microphone with a spare microphone assembly. If no sound can be produced after microphone replacement, it may be assumed that the amplifier or speaker assembly is defective.
4. To test the speaker, disassemble the speaker. Unplug the wires and apply 1 ½ volts intermittently across the speaker. If no clicks are heard, the speaker is defective.

Possible faults and corrections are summarized below for ready reference.

TROUBLE	POSSIBLE CAUSE	CORRECTION
No sound from speaker when handle is squeezed (Step 1)	Exhausted batteries, defective microphone, speaker or amplifier assembly	Replace defective component
Sound is abnormally low or distorted	Exhausted batteries or wrong polarity of battery series	Check proper insertion of batteries or replace batteries.
Speaker does not respond to Step 4	Defective speaker	Replace speaker

4.2 Repair

The megaphone consists of three major sub-assemblies; the microphone and mouthpiece assembly, the megaphone sub-assembly, and the horn and speaker assembly. Repairs are restricted to the replacement of these defective sub-assemblies or the batteries and lanyard assemblies.

SECTION 5 – DISASSEMBLY & ASSEMBLY

5.1 Disassembly

Megaphone should be disassembled for repair or replacement of components only.

1. Remove microphone and mouthpiece assembly (1) by removing the three set screws (2).
2. Remove battery cells (3) from the three tubes by tilting megaphone to allow cells to drop out into the hand.
3. Remove the three oval head screws (9) at periphery of the speaker end of the housing (13).
4. Extract speaker & megaphone subassembly by firstly turning horn (14) clockwise approximately 45°. Secondly pull the entire assembly gently until it stops. Rotate the assembly counterclockwise 45° then pull the entire assembly out.
5. Separate the speaker assembly (5) and megaphone subassembly (8) by firstly unplugging the speaker wires from the “out” header. Then, remove the hex screw that holds the assemblies together.
6. **FURTHER DISASSEMBLY IS NOT RECOMMENDED.**

Inspect unit for any evidence of damaged parts, loose mountings or broken leads and dirty electrical contacts.

5.2 Assembly

1. Align horn (14) and speaker assembly (5) with location pins on megaphone subassembly (8).
2. Attach horn (14) and speaker assembly (5) to megaphone subassembly (8). Route speaker wires through provided slot.
3. Plug speaker connector into the “out” header.
4. Push entire assembly gently into the housing (13), until it stops. Turn clockwise 45° and push all the way in. Turn counterclockwise 45° and align holes.
5. Secure with screws (9).
6. Replace the six batteries (3) in three tubes at microphone end of megaphone case.



CAUTION: Observe polarity of batteries during installation procedure (see instructions on battery tubes).

7. Replace microphone and mouthpiece assembly (1). Align keyway, and secure with the three setscrews (2).
8. Assembly is complete. Test unit in accordance with Section 4.1.

SECTION 6 – PARTS LIST

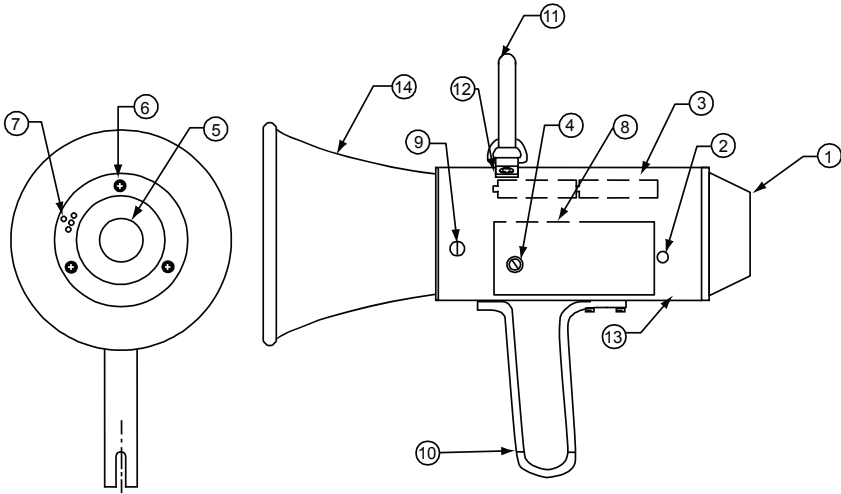


FIGURE 2
ACR/EM-2BA PORTABLE SAFETY MEGAPHONE
ILLUSTRATED PARTS LIST

Replaceable parts are illustrated in Figure 2 (shown above), and listed in the table (shown below). Part numbers shown in the "Part Number" column may be ordered from ACR unless another manufacturer's name is given in parentheses in the "Description" column. In this case, replacement parts can be obtained directly from the original manufacturer. Standard parts (MS-, AN-, etc.) and commercially available hardware ("Commercial") should be obtained from commercial sources.

ITM	QTY	NOMENCLATURE	ORDER SPARE PARTS	
			ACR/EM-2BA S/N < 2000*	ACR/ EM-2BA S/N ≥ 2000*
1	1	Microphone & Mouthpiece Assy	9211	9211
2	1	Socket Setscrew Kit	9416	9416
3	6	Battery AA Alkaline	Commercial	Commercial
4	1	Hole Plug	A1-05-0562	A1-05-0562
5	1	Speaker Assembly	9419 (upgrade kit)	9418
6	3	Screw, Self tap (#4 x 3/4)	Commercial	N/A
7	2	Wire leads speaker (#26AWG)	Commercial	N/A
8	1	Megaphone Subassy	9419 (upgrade kit)	9421
9	3	Screw Machine (#4-40 x 3/8)	Commercial	Commercial
10	1	Handle Kit	9423	9423
11 & 12	1	Strap Assembly Kit	9233	9233
13	1	Housing Megaphone	A1-18-1151	A1-18-1151
14	1	Horn, Megaphone	A1-17-0809	A1-17-0809

*S/N ≥ 2000 are date coded 4/99 +

SECTION 7 – TECHNICAL DATA

Dimensions	5.5" max diameter bell, 11.5" max long
Weight	2.3 lbs., including batteries
Materials	Horn, handle – Anodized Aluminum
	Housing – Aluminum
	Attachment – Neck strap at top of unit
Gain Control	Internal (accessible)
Amplifier	Integrated circuit, 2 watts power output
Speaker	Re-entrant horn and driver type
	input power five (5) watts
	90° dispersion angle
Batteries	Six (6) standard 1½ volt "AA" cells
Power Drain	12 milliamps static current
	550 milliamps maximum current
Frequency Response	500 to 3500 Hz
Battery Test Circuits	Visual Flashing Green LED

APPENDIX - WARRANTY, USEFUL LIFE, NOTICES

A.1 Limited Warranty

This product is warranted against factory defects in material and workmanship for a period of 1 (one) year* from date of purchase or receipt as a gift. During the warranty period ACR Electronics, Inc. will repair or, at its option, replace the unit at no cost to you for labor, materials and return transportation from ACR. For further assistance, please contact our Technical Service Department at ACR Electronics, Inc., 5757 Ravenswood Road, Fort Lauderdale, FL 33312-6645. Email: service@acrelectronics.com, Fax: +1 (954) 983-5087, Telephone: +1 (954) 981-3333.

This warranty does not apply if the product has been damaged by accident or misuse, or as a result of service or modification performed by an unauthorized factory. Except as otherwise expressly stated in the previous paragraph, THE COMPANY MAKES NO REPRESENTATION OR WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, AS TO MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR ANY OTHER MATTER WITH RESPECT TO THIS PRODUCT. The Company shall not be liable for consequential or special damages.

To place the warranty in effect, register online at www.acrelectronics.com or return the attached card within 10 days.

*Five years for the following products: EPIRB, PLB, S-VDR, SSAS.

A.2 Useful Life Policy

The typical service life of a properly maintained Product is limited to 12 years from date of manufacture. Products that are 12 years and 1 month or older from date of manufacture will not be serviced by ACR or our Battery Replacement Centers. A Product that is 12 or less years old from date of manufacture will be serviced as long as the unit appears fit to be placed back into its final operational cycle. Service includes the replacement of those items that must be replaced at service intervals and the verification that the device appears to be in good mechanical and electrical working condition by an ACR authorized service technician.

A.3 Notices

ACR Electronics diligently works to provide a high quality Product Support Manual, however, despite best efforts, information is subject to change without notice, and omissions and inaccuracies are possible. ACR cannot accept liability for manual contents. To ensure that you have the most recent version of the Product Support Manual, please visit the ACR website at www.acrelectronics.com.

©2009 by ACR Electronics, Inc., part of Cobham plc. All rights reserved. Reproduction in whole or in part is permitted only with permission of ACR Electronics, Inc.

Ongoing product improvements may change product specifications without notice.

Trademarks or registered trademarks are the property of their respective owners.