



TECHNICAL MANUAL
OPERATION AND INSTALLATION
INSTRUCTIONS

DUAL-CHANNEL
UHF ANTENNA
AS-4163/URC

VTM-02-008-REV C

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RECORD OF CHANGES

CHANGE NUMBER	DATE	TITLE OF BRIEF DESCRIPTION	ENTERED BY
-	21 January 2002	Original Issue	
A	12 July 2002	Add AS-390 Mounting adapter in Table 1-2	
B	27 November 2007	Added preventative maintenance paragraph regarding salt residue and sea-spray in section	
C	24 June 2008	Remove AS-390 Mounting adapter and cable located inside antenna. Added dimensions, weight to adapter and cable.	

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SECTION 1

GENERAL INFORMATION AND SAFETY PRECAUTIONS

1-1. GENERAL SAFETY PRECAUTIONS. The following general safety precautions are not related to any specific procedures and therefore do not appear elsewhere in this publication. These are recommended precautions that personnel must understand and apply during many phases of operation and maintenance.

WARNING

Keep away from live circuits. Operating personnel must at all times observe all safety regulations, to prevent serious injury or death due to electrical shock.

Do not service or adjust alone. Under no circumstances should any person service or adjust the equipment except in the presence of someone who is capable of rendering aid.

Personnel working with or near high voltages should be familiar with modern methods of resuscitation.

1-2 SPECIFIC WARNINGS. The following specific precautions are related to inspecting and removing the antenna.

WARNING

Ensure that the transmitting equipment is de-energized prior to inspection of the antenna. Make sure the test equipment is properly grounded, to prevent electric shock.

CAUTION

Make sure the antenna is properly supported before removing its mounting hardware.

CAUTION

Do not coat the insulator with any substance; do not paint with lead base paints.

1-3. INTRODUCTION.

1-3.1 Purpose. This manual provides general information, operating and functional description, and installation data for the AS-4163/URC antenna. Information in this manual will assist in installing and operating the antenna.

1-3.2 Scope. This technical manual is provided to aid in the operation and installation of the antenna.

1-3.3 Applicability. This manual applies to the dual-channel UHF Antenna AS-4163/URC.

1-4. EQUIPMENT DESCRIPTION.

1-4.1 General Description. The antenna, shown in Figure 4-1 is a 96 inch transmitting/receiving dual-channel UHF dipole antenna for general use with UHF communications equipment. The antenna has two independent broadband elements that are housed within a fibreglass insulator radome with an integral fibreglass mounting base and a top aluminum flange. A feed through cable runs from the base to the top of the antenna so that another antenna type can be mounted on the top flange.

1-4.2 Capabilities. The antenna provides vertically polarized, omnidirectional azimuth radiation from 225 to 400 MHz. The two aluminum antenna elements are high power dipoles, each can handle power up to 1000 watts. The antenna meets high shock and vibration requirements.

1-4.3 Limitations. When used as directed, the antenna has no limitations.

1-5. RELATIONSHIP TO OTHER EQUIPMENT. The AS 4163/URC Antenna interfaces with the UHF receiving and transmitting equipment with 50 ohm outputs..

1-6. REFERENCE DATA. Table 1-1 lists the reference data for the antenna.

1-7. EQUIPMENT ACCESSORIES, AND DOCUMENTS SUPPLIED. Table 1-2 lists the equipment and documents supplied.

Table 1-1. Reference Data

PARAMETER	SPECIFICATION
NOMENCLATURE	DUAL-CHANNEL UHF ANTENNA AS 4163/URC
MANUFACTURER	VALCOM LIMITED 35736
FREQUENCY RANGE	225 TO 400 MHZ
VSWR	3.0:1 MAXIMUM 2.5:1 AVERAGE
IMPEDANCE INPUT INPUT CONNECTOR	50 OHMS INPUT N-TYPE RECEPTACLE (3 PLACES)
ISOLATION	25 dB MINIMUM
POLARIZATION	VERTICAL
POWER CAPABILITY	1 KW EACH CHANNEL (PEAK)
RADIATION PATTERN	OMNIDIRECTIONAL
TEMPERATURE	OPERATING: -55°C TO +65°C NON OPERATING: -62°C TO +71°C
WIND VELOCITY	120 MPH (NO ICE)
HUMIDITY	95%
SHOCK	QUALIFIED TO MEET MIL-S-901 C
VIBRATION	QUALIFIED TO MEET MIL-STD-167-1 TYPE I AND II
HEIGHT	96 ± 1 INCHES
WEIGHT	40 ± 0.5 POUNDS
BASE MOUNTING	∅ 13.5 INCH FIBREGLASS FLANGE WITH 8 X ∅ 0.562 INCH HOLES ON A ∅ 11.75 INCH BOLT CIRCLE
TOP MOUNTING	∅ 6.88 INCH ALUMINUM FLANGE WITH 12 X 5/16-18 UNF THREADED HOLES ON A ∅ 6.12 INCH BOLT CIRCLE

Table 1-2. Equipment, Accessories and Documents Supplied

QTY	NOMENCLATURE	OVERALL DIMENSIONS (INCHES)			WEIGHT (POUNDS) UNCRATED
		CRATED	UNCRATED		
		LG x WD x H	HEIGHT	DIA	
1	ANTENNA AS 4163/URC	104 x 22 x 22	96	13.5 Base	40
1	TECHNICAL MANUAL FOR AS 4163/URC ANTENNA	--	--	--	--
1	RF COAXIAL CABLE N-N TYPE PLUG (MALE)	--	24	0.5	0.25
1	AS-390 MOUNTING ADAPTER	--	9.5	7.0 Base	2

SECTION 2

OPERATION

2-1. INTRODUCTION. This chapter provides operating instructions for the antenna.

2-2. CONTROLS AND INDICATORS. The antenna contains no controls or indicators.

2-3. OPERATING PROCEDURES.

2-3.1 Operator Turn-On. No operator turn-on procedures apply since no power is required to operate the antenna. However, the antenna is coupled to RF equipment (transmitter/receiver) and to associated systems which may require energizing. For operating instructions, consult the appropriate technical manuals.

2-3.2 Modes of Operation. The antenna operates automatically, and no operator intervention is required other than interconnecting various associated equipment with the antenna.

2-3.3 Operation Under Interfering Conditions. No additional or alternate instructions are necessary to operate the antenna under interfering conditions.

2-3.4 Operator Turn-off. Since no power is required to operate the antenna, no operator turn-off is required. However, the specific equipment connected to the antenna may require operator turn-off. Consult the associated technical manuals for turn-off procedures.

2-3.5 Emergency Operation. No additional or alternate steps are necessary to operate the antenna under emergency conditions.

2-3.6 Emergency Turn-off. The antenna requires no emergency turn-off. For emergency turn-off of specific equipment connected to the antenna, consult the associated technical manuals.

SECTION 3

FUNCTIONAL DESCRIPTION

3-1. INTRODUCTION. This chapter provides the functional description of the antenna.

3-2. OVERALL LEVEL. The antenna is a base mounted, high-power antenna which provides omnidirectional coverage for general purpose communications reception and transmission from 225 to 400 MHz.

3-3. MAJOR FUNCTION LEVEL. The antenna consists of two independent aluminum radiating elements that are housed within a fibreglass radome with an integral fibreglass insulator/mounting base and a top aluminum mounting flange. The integral fibreglass insulator/mounting base isolates the radiating elements of the antenna from the ground and physically supports the two-channel elements. The insulator/mounting base is constructed of high-strength, laminated epoxy fibreglass materials.

The antenna does not require external couplers. Only a transmitter or receiver is required to be connected to the antenna.

SECTION 4

INSTALLATION

4-1. SITE INFORMATION. Valcom's AS-4163/URC Dual-channel UHF Antenna is designed primarily for shipboard installation. The antenna can also be used at shore installations. The antenna should be installed in a non-obstructed environment, clear from any contiguous structures, such as masts, bulkheads, or other metal objects.

4-2. TOOLS AND MATERIALS REQUIRED. No special tools and materials are required for installation.

4-3. UNPACKING AND RE-PACKING. To unpack, carefully remove the screws holding the cover, and remove the antenna from the container. Save the container to pack the antenna for reshipment. No special handling procedures are required; observe normal precautions when handling the antenna.

4-4. FOUNDATION. The antenna should be installed vertically on a mounting plate that has bolt holes matching those in the antenna mounting base (see figure 4-1).

4-5. INPUT REQUIREMENTS. Two UHF channels of the antenna have an rf power handling up to 1000 watts at the 50 ohm input impedance.

4-6. INSTALLATION PROCEDURES. After unpacking the antenna, proceed with its installation as follows:

a. Examine the exterior of the antenna for damage; make sure that the fibreglass radome and the top mounting flange have not been damaged, misaligned, or fractured.

b. Mount the other antenna (ie AS-390) to the top mounting flange of the antenna with hardware and a mounting adapter (if applicable) and then connect the rf cable (24") from the top N-type receptacle output to the other antenna input. Hardware and mounting adapter to be determined and supplied by the installing activity. Secure the mounting adapter with 5/16"-18 UNC hex head screws, flat washers and slip lock-washers.

c. Carefully lift the antenna to its mounting platform. Align the mounting holes of the base flange with the mounting holes in the platform.

d. Secure the antenna to its mounting plate with eight ½"-13 UNC hex head cap screws, flat washers, split lock-washers and nuts. Hardware to be determined and supplied by the installing activity.

e. Connect the system connectors to the antenna at any one of the three input N-type receptacles. Connect the ground strap wire to the ground plane.

4-7. INSTALLATION CHECKOUT. Checkout of the antenna after installation can only be accomplished by operating the receiving and transmitting equipment that is used with the antenna.

Note: If replacing an existing antenna with a new antenna, it is recommended that new mounting hardware be used.

SECTION 5

5-1. PREVENTATIVE MAINTENANCE. When used in salt-water environments, it is recommended to wash the antenna base with fresh water to remove any build-up of dried salt residue. This should be performed on a monthly basis or after prolonged exposure to sea-spray.

