

REVISIONS			
LTR	DESCRIPTION	DATE	APVD
A	RN0702 – Miscellaneous	01-12-06	JJD

Statement A, Unlimited

1.0 Scope: This drawing details the requirements for an S-Band Antenna, for commercial airborne applications.

- The part number is the seven (7) digit drawing number plus the applicable dash number as specified in Table I.
- Paragraph(s), table(s) and/or figure(s) followed by “**I**” indicate a change by the latest revision.
- All Sheets are the Same Revision Status.
- Metric Units May Apply.

Sensor Systems, Inc., Chatsworth, CA	TA	13691	See Table I
<b>SUGGESTED SOURCES OF SUPPLY</b>	<b>CAL</b>	<b>CAGE CODE</b>	<b>VENDOR PN</b>

<b>UM</b> Each (EA)		<b>VENDOR ITEM DRAWING</b>			
CONTRACT NO		<b>Rockwell Collins, Inc.</b> 400 Collins Rd NE Cedar Rapids, IA 52498  <b>Antenna, S-Band</b>			
PREP	S.K. Danek 98-12-22				
CHK	J.J. Day 98-12-22				
ENGR	R.R. Kolb	SIZE	CAGEC	DWG NO	REV
APVD	98-12-22	<b>A</b>	<b>13499</b>	<b>013-1965</b>	LTR <b>A</b>
DOCUMENT GENERATED USING INTERLEAF		SCALE NONE		SHEET 1 OF 10	
<b>DO NOT REVISE MANUALLY</b>					

2.0

Applicable Documents: The following documents of the issue in effect on the date of invitation for bids form a part of this drawing to the extent specified herein.

Federal Standard

FED-STD-595 Colors Used in Government Procurement

Industry Standards

IPC A-610C Acceptability for Electronic Assemblies

ISO 2669 Environmental Tests for Aircraft Equipment –  
Steady-State Acceleration Second Edition

RTCA DO-160 Environmental Conditions and Test Procedures for  
Airborne Equipment

RTCA DO-178 Software Considerations in Airborne Systems and  
Equipment Certification; Errata

Reference 2.1-1

IEEE 802.3 Information Technology—Telecommunications and  
Information Exchange Between System—Local and  
Metropolitan Area Networks—Specific  
Requirements—Part 3: Carrier Sense Multiple Access  
With Collision Detection (CSMa/CD) Access Method  
and Physical Layer Specifications [ANSI/IEEE Std  
802.3, 1993 Edition].

Reference 2.1-2

IEEE 802.00-1999 Information Technology—Telecommunications and  
Information Exchange Between Systems—Local and  
Metropolitan Area Networks— Specific  
Requirements—Part 11: Wireless LAN Medium  
Access Control (MAC) and Physical Layer (PHY)

Reference 2.1-3

IEEE 802.11b-1999 Supplement to Standard for Information Technology—  
Telecommunications and Information Exchange  
Between System—Local and Metropolitan Area  
Networks—Specific Requirements—Part 11: Wireless  
LAN Medium Access Control (MAC) and Physical  
Layer (PHY)

Reference 2.1-4

Design Assurance Guidance for Airborne Electronic  
Hardware (RTCA/DO-254) Radio Technical  
Commission for Aeronautics (RTCA), Inc.; 1140  
Connecticut Avenue, NW, Suite 1020, Washington, DC  
20036-4001; April 19, 2000 [RTCA/DO-254].

SIZE <b>A</b>	CAGE <b>13499</b>	DWG NO <b>013-1965</b>	REV LTR <b>A</b>
SCALE NONE			SHEET 2

Reference 2.1–5 Software Considerations in Airborne Systems and Equipment Certification; (RTCA/DO–178B) Radio Technical Commission for Aeronautics (RTCA), Inc.; 1140 Connecticut Avenue, NW, Suite 1020, Washington, DC 20036–4001; December 1, 1992 [RTCA/DO–178B].

Reference 2.1–6 Environmental Conditions and Test Procedures for Airborne Equipment; (RTCA/DO–160D) Radio Technical Commission for Aeronautics (RTCA), Inc.; One McPherson Square 1425 K Street, NW, Suite 500, Washington, DC 2005 [RTCA/DO–160D, July 29, 1997].

Reference 2.1–7 European Telecommunication Standard ETS 300 328 A1 July 1997 Radio Equipment and Systems (RES); Wideband Transmission System; Technical Characteristics and Test Conditions for Data Transmission Equipment Operating in the 2.4 Gigahertz (GHz) ISM Band and Using Spread Spectrum Modulation Techniques European Telecommunications Standards Institute, Postal Address: F–06921 Sophia Antipolis CEDEX – France.

Reference 2.1–8 USA FCC Parts 15.247 and 15.205

Reference 2.1–9 Japan MPT Ordinance for Regulatory Radio Equipment, Article 49–20.

Reference 2.1–10 SPEC 2000: Integrated Data Processing Materials Management. Air Transport Association 1301 Pennsylvania Avenue Northwest, Suite 1100, Washington, DC 20004.

Reference 2.1–11 Ethernet Local Area Network (ELAN) [ARINC–646]

Reference 2.1–12 Aircraft Network and Server Unit (ANSU), December 17, 1999 [ARINC 763]

Reference 2.1–13 RFC 0793 Transmission Control Protocol [TCP]

Reference 2.1–14 RFC 0791 Internet Protocol [IP]

Reference 2.1–15 Airworthiness Standards: Transport Category Airplanes (FAR Part 25). Federal Aviation Regulations Part 25, January 1, 1994. [FAR Part 25].

Reference 2.1–16 ISO 2669

Internal Related

Reference 2.2–1 Fabrication Practices, RCPN 580–5800–001

SIZE <b>A</b>	CAGE <b>13499</b>	DWG NO <b>013–1965</b>	REV LTR <b>A</b>
SCALE NONE			SHEET 3

### Acronyms and Abbreviations

ARINC	Aeronautical Radio, Inc
CCR	Country Code Roaming
(C)WLU	Cabin Link Function of WLU
DSSS	Direct Sequence Spread Spectrum
FHSS	Frequency Hopping Spread Spectrum
FSU	File Server Unit
FTP	File Transfer Protocol
IEEE	Institute of Electrical and electronic Engineers
I/O	Input/Output
LAN	Local Area Network
MAA	Microwave Airborne Antenna
MTBF	Mean Time Between Failures
MTTR	Mean Time to Repair
PMAA	Portable Microwave Airborne Antenna
RC	Rockwell Collins
RF	Radio Frequency
RLU	Radio LAN Unit Component of the WLU-2001
RTCA	Radio Technical Commission for Aeronautics
SIU	Server Interface Unit
SRD	System Requirement Document
TCP	Transmission Control Protocol
TCP/IP	Transmission Control Protocol/Internet Protocol
TFTP	Trivial FTP
(T)WLU	Terminal Wireless LAN function of WLU
TX	Transmit
WAN	Wide Area Network
WLU	Wireless LAN Unit
WoW	Weight-on-Wheels

SIZE <b>A</b>	CAGE <b>13499</b>	DWG NO <b>013-1965</b>	REV LTR <b>A</b>
SCALE NONE			SHEET 4

- 3.0 Requirements:
- 3.1 Electrical:
- 3.1.1 The MAA–2000 shall have electrical characteristics in accordance with Table II.
- 3.2 Mechanical:
- 3.2.1 Connector:
- 3.2.1.1 The MAA–2000 shall have a Type TNC female connector.
- 3.2.2 Mechanical Configuration: See Figure 1 herein.
- 3.2.3 Equipment Size and Mounting:
- 3.2.4 Equipment Weight: The MAA–2000 shall have a weight not to exceed 0.3 maximum.
- 3.2.5 Industry Regulatory Requirements:
- 3.2.5.1 Federal Aviation Administration (FAA) Certification:  
The MAA–2000 shall be developed to RTCA/DO–178 Level E.  
The MAA–2000 shall be developed to RTCA/DO–254 Level E.
- 3.2.5.2 European Test System I (ETSI) Certification: The MAA–2000 shall meet the European Test Requirement (ETS) 300 328 [Reference 2.1.7].
- 3.2.5.3 Federal Communications Commission (FCC) / Department of Communication (DOC) Certification:  
The MAA–2000 shall meet the FCC test requirements FCC Rules Part 15 and RSS–210 of Industry Canada. [Reference 2.1–8].
- 3.2.5.4 Other Certifications: The MAA–2000 shall meet the Japan Test requirements RCR STD–33. [Reference 2.1–9]
- 3.2.5.5 Equipment Color: White #17925 in accordance with FED–STD–595B.
- 3.2.6 Markings: As a minimum, markings shall include the manufacturer's name or trademark or cage code, the manufacturer's part number, revision letter, serial number or date code, and the Rockwell Collins part number. Where part size precludes marking, the smallest part container shall contain the required markings.
- 3.3 Environmental:
- 3.3.1 Environmental / Electro–Magnetic Interference (EMI) Certification:  
The MAA–2000 shall be tested in accordance with RTCA/DO–160 requirements. See Table III.
- 3.3.2 Materials: The MAA–2000 shall be constructed of materials, which are nontoxic and fire retardant to meet the following standards: FAR 25.853, CFR Title 14 Part 25.869. Part shall be resistant to fungus.
- 3.3.3 Nameplates or Product Markings: Shall be in accordance with 839–0497–001.

SIZE <b>A</b>	CAGE <b>13499</b>	DWG NO <b>013–1965</b>	REV LTR <b>A</b>
SCALE NONE			SHEET 5

- 3.3.4 Workmanship: In accordance with ANSI/J-STD-001, Class II or greater, IPC-610, and 580-5800-001 and locking devices required.  
The MAA-2000 should be visually inspected for paint scratches, dents or other physical defects prior to delivery to the customer. The MAA-2000 should be inspected for freedom of common solder defects [Ref. 2.2.-1]
- 3.4 The MAA-2000 shall have a mean time between failure (MTBF) of greater than or equal to 100,000 operational hours.
- 4.0 Quality Assurance Provisions:
- 4.1 Qualification Requirements: Qualification shall consist of the necessary tests and inspections required to verify conformance to section 3.0 herein.
- 4.2 Quality Conformance Inspection: The suppliers shall be responsible for those in-process controls and inspections necessary to supply a product consistently conforming to the requirements of this drawing.  
The procuring activity reserves the right to inspect for any of the requirements of this drawing to determine the acceptability of a lot and to reject nonconforming parts or lots containing nonconforming parts, on the basis of the test results so obtained.
- 4.3 Design Change Approval: Any changes in form, fit, function, materials, or performance that affect the part or materials defined by this drawing, must be approved by the cognizant procuring activity prior to the incorporation of the proposed changes.
- 5.0 Preparation For Delivery:
- 5.1 The parts shall be packaged in a manner that will afford adequate protection against contamination, corrosion, deterioration and physical damage during shipment and storage. Parts shall be packaged so they will be easily accessible without damaging the parts.
- 6.0 Notes: The information contained in this section is for reference only.
- 6.1 Identification of the Suggested Source(s) of Supply hereon is not to be construed as a guarantee of present or continued availability as a source of supply for the item(s).
- 6.2 The MAA-2000 shall be free of sharp edges, and hot surfaces that may cause injury to maintenance personnel during installation, operation and maintenance of the equipment.

SIZE <b>A</b>	CAGE <b>13499</b>	DWG NO <b>013-1965</b>	REV LTR <b>A</b>
SCALE NONE			SHEET 6

**TABLE I**

Rockwell Collins Dash Number, Vendor Part Number

<b>Dash Number</b>	<b>Sensor Systems Part Number</b>
010	S65-5366-71S

SIZE <b>A</b>	CAGE <b>13499</b>	DWG NO <b>013-1965</b>	REV LTR <b>A</b>
SCALE NONE			SHEET 7

**TABLE II**

Electrical Characteristics

<b>Parameter</b>	<b>Performance</b>
Frequency	2200 – 2500 MHz
Polarization	Vertical
Impedance	50 Ohms
Voltage Standing Wave Ratio (VSWR)	1.5:1 Maximum
Power	1000 W/peak, 50 W/continuous
Antenna Gain	4.75 Decibels in Reference to isotropic radiator
Pattern	Omni Directional

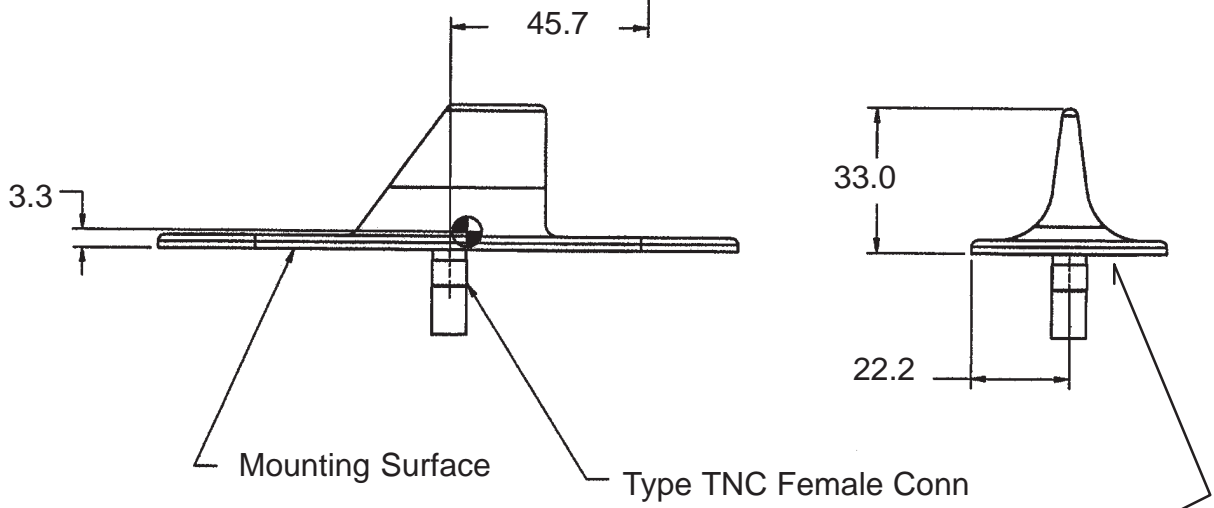
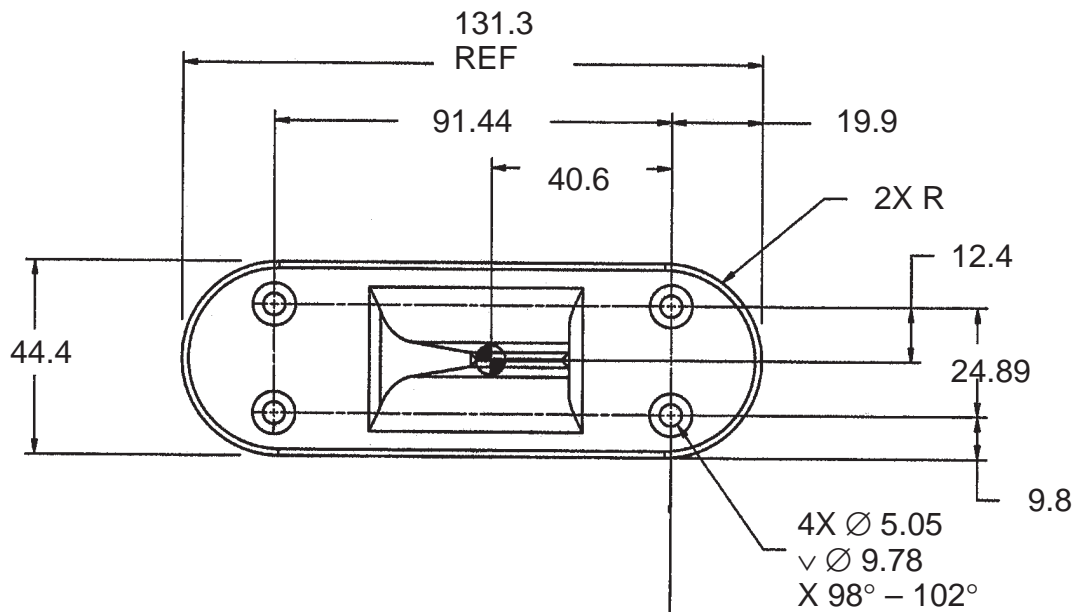
SIZE <b>A</b>	CAGE <b>13499</b>	DWG NO <b>013-1965</b>	REV LTR <b>A</b>
SCALE NONE			SHEET 8



**TABLE III**Environmental Characteristics

<b>Section</b>	<b>Test</b>	<b>Category</b>
4.0	Temperature and Altitude	D2
5.0	Temperature Variation	A
6.0	Humidity	C
7.0	Operational Shocks and Crash Safety Operational Shocks Crash Safety Impulse Crash Safety Sustained	A A A
8.0	Vibration	SC
9.0	Explosion Proofness	X (No test required)
10.0	Waterproofness	S
11.0	Fluids Susceptibility	F
12.0	Sand and Dust	D
13.0	Fungus Resistance	F
14.0	Salt Spray	S
15.0	Magnetic Effects	X (No test required)
16.0	Power Input	X (No test required)
17.0	Voltage spike	X (No test required)
18.0	Audio Frequency Conducted Susceptibility–Power inputs	X (No test required)
19.0	Induced Signal Susceptibility	X (No test required)
20.0	Radio Frequency Susceptibility (Radiated and Conducted)	X (No test required)
21.0	Emissions of Radio Frequency Energy	X (No test required)
22.0	Lightning Induced Transient Susceptibility	X (No test required)
23.0	Lightning Direct Effects	2A
24.0	Icing	X (No test required)
25.0	Electrostatic Discharge (ESD)	X (No test required)

SIZE <b>A</b>	CAGE <b>13499</b>	DWG NO <b>013–1965</b>	REV LTR <b>A</b>
SCALE NONE			SHEET 9



Package must be marked with part number and expiration date.

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METRIC

**FIGURE 1**  
Mechanical Configuration

UNLESS OTHERWISE SPECIFIED  
DIMENSIONS ARE METRIC.  
APPLICABLE TOLERANCES: ANGLES;  $\pm 1.0^\circ$   
DECIMALS; X =  $\pm 0.5$ , XX =  $\pm 0.02$

SIZE <b>A</b>	CAGE <b>13499</b>	DWG NO <b>013-1965</b>	REV LTR <b>A</b>
SCALE NONE		SHEET 10	