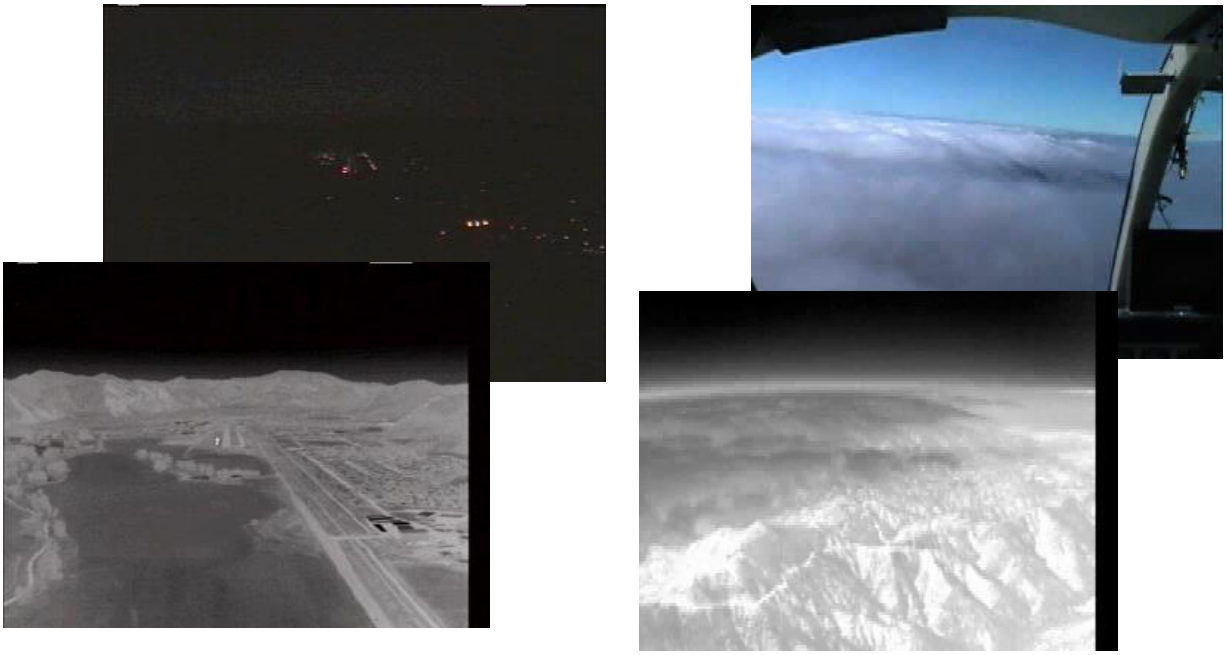
MAX-VIZ® 2300
ENHANCED VISION SYSTEMS

Information Manual

Max-Viz 2300 Enhanced Vision System

See What You'll Be Missing



Astronics Max-Viz
11241 SE Highway 212
Clackamas, Oregon 97015 USA

This product is protected by patents and patents pending.

Revision History

Revision	Date	Change Description
-	4/3/2017	Production Release
A	5/31/2017	Added 3 additional models and updated the ICD
B	7/12/2017	Updated the ICD
C	3/14/2018	Updated the startup sequence in section 4

Table of Contents

1. INTRODUCTION

This document provides guidance on the installation, operation, and maintenance of the Max-Viz, Inc. Enhanced Vision System (EVS) Model 2300 product.

2. SYSTEM DESCRIPTION

The Max-Viz 2300 is comprised of one Line Replaceable Unit (LRU) designed to provide the flight crew with enhanced visual awareness of terrain and potential obstacles in the aircraft's forward field of view.

The Sensor LRU includes a long-wave infrared (IR) camera assembly that produces an infrared image and a CMOS camera that produces a visible image. The two images are combined in the sensor electronics to produce a single blended Black and White image. The Sensor LRU has an additional color visible video output. The normal horizontal field of view is 45 degrees. When the ZOOM_IN discrete input signal is activated, the field of view is switched to 30 degrees.

The video outputs are composite video, RS-170 or factory selectable to PAL. The video display represents a thermal scene of the area in front of the aircraft and provides the flight crew with enhanced vision capability in low visibility conditions.

2.1. Equipment Identification

The Max-Viz 2300 system components are identified below.

Name	DWG. Part Number	Drawing Title
Max-Viz 2300	756500056	MV2300 ASSEMBLY
Max-Viz 2300	756500072	MV2300 ASSEMBLY – WITHOUT COLOR ZOOM
Max-Viz 2300	756500073	MV2300 ASSEMBLY – PAL VIDEO
Max-Viz 2300	756500074	MV2300 ASSEMBLY – PAL VIDEO, WITHOUT COLOR ZOOM

On our product labels, Max-Viz part numbers and revisions are signified by a nine digit number followed by an "R" and a letter. The "R" and letter signify the revision level. As an example, 756500056R- is the part number 756500056 at Revision -. Revision – is the first production release followed by Revision A.

Our drawings have a standard engineering title block, with separate blocks for the Part Number and another for the Revision.

2.2. Electrical Characteristics

The Max-Viz 2300 does not require any supplemental heating or cooling from the aircraft and the electrical characteristics are listed below.

Characteristic	Specification
Voltage	28 VDC from aircraft power
Max Power	<3.0 A at 28 VDC (84 Watts, heaters activated)

2.3. Physical Characteristics

The physical characteristics of the Max-Viz 2300 Sensor LRU are listed below.

Characteristic	Specification
Sensor	
Sensor Unit Diameter:	2.770 inch Diameter (70,3 mm)
Depth:	6.179 in. (156,9 mm)
Overall length:	6.828 in. (173,4 mm)
Weight:	< 2.5 lbs (1,13 kg)

2.4. Export Control

Export of the Max-Viz 2300 Sensor is governed by the Commerce Department, Bureau of Industry and Security. The sensor has export classification control numbers of 6A003(b)(4).

Max-Viz 2300 commodities, technology, or software shall be exported from the United States in accordance with the Export Administration Regulations. Diversion contrary to U.S. law is prohibited.

3. INSTALLATION PLANNING

All installations in certified aircraft should be performed per FAA-approved installation instructions, such as an STC or service bulletin. This information is provided to assist in the design of a certified installation.

The +28 Vdc supply to the Sensor should be routed through a suitably labeled circuit breaker.

Particular attention must be taken in routing the video coax cable through the aircraft structure to avoid potential RFI from noise items and to minimize the cable bend radius.

3.1. Interface Connections

3.1.1. Interconnect between the Sensor LRU and the Aircraft

The cable harness between the Sensor and the aircraft can typically be fabricated from standard 22 AWG aircraft wire (e.g., M27500 twisted shielded pair, TP = Twisted Pair). Longer cable runs require the use of heavier gauge wire.

- An overall metal cable shield tied to both ends into the connector back shells is recommended.
- Under no circumstance may signals from multiple pins be spliced and carried in a single wire.

Sensor Connector Pin No.	Description	Recommended Wire
1	+ 28 VDC Power Input	22 AWG Shielded TP1
2	28 VDC RTN	22 AWG Shielded TP1
3	+ 28 VDC Power Input	22 AWG Shielded TP2
4	28 VDC RTN	22 AWG Shielded TP2
5	Reserved	
6	Reserved Factory Use Only	
7	Reserved Factory Use Only	
8	Reserved Factory Use Only	
9	Reserved	
10	Reserved	
11	Reserved	
12	One end of p/n 506500128	
13	One end of p/n 506500128	
14	NUC Inhibit Input	22 AWG
15	Digital Zoom Input	22 AWG
16	Reserved	
17	Reserved	
18	Chassis/Shields	22 AWG
19	Color Video Output	RG-179 (Pic Wire & Cable P/N V76261)
20	Color Video RTN	Coax shield/Braid
21	Blended Video	RG-179 (Pic Wire & Cable P/N V76261)
22	Blended Video RTN	Coax shield/Braid

Notes:

1. A discrete input (Digital Zoom Input) is provided to control the field of view (FOV) switching function as follows:
    a. Left open or grounded to 0 volts (< 2 volts), the wide angle, 45°, FOV is selected.
    b. Held at 28 volts (> 7 volts), the narrow angle, 30°, FOV is selected.
2. A discrete input is provided to control the Non-Uniform Correction (NUC Inhibit Input) function as follows:
    a. Left open or grounded to 0 volts (< 2 volts), NUC automatically occurs at programmed intervals.
    b. On transition from 0 to 28 volts (> 7 volts), one NUC cycle occurs and then further NUC cycles are inhibited until the input goes back to 0 (< 2 volts).
    c. On transition from 28 to 0 volts (< 2 volts), one NUC cycle occurs and then further NUC cycles automatically occur at programmed intervals.

3.1.2. Interface Connectors

The connectors required to fabricate a harness between the Sensor and the aircraft are:

- Connectors, qty 1, P/N D38999/26WC35SN (Max-Viz p/n 501500001) with
- Back shells, qty 1, Glenair P/N 380HS001M1310H3 (Max-Viz p/n 501000034) or P/N M85049/1913W04 (Max-Viz p/n 501000017) or equivalent.

If the harness will run through a bulkhead, ensure that the connectors have the appropriate number of pins (i.e. 22) and no wires are spliced together.

3.1.3. Interconnection Losses

The maximum video coaxial cable loss from the Max-Viz 2300 to the display should not exceed 1dB (Note: this is a generic figure to cover all AES types and equipment configurations. If this cannot easily be achieved in any particular installation, then Max-Viz, Inc. should be contacted to determine whether a more relaxed insertion loss can be considered without decreasing system performance or raising certification issues). There should be no cable loss limitations for RG-179 if less than 100 feet.

If multiple displays are to be connected, the video signal from the Max-Viz 2300 should go directly to a multiple output amplified video buffer with as short of a run as feasible prior to going to the displays in order to avoid signal termination losses. The Audio International VA-400 has been used successfully.

It is highly recommended to avoid routing the video coax in close proximity to electrical noise sources such as motors, generators, transmitters, etc. Do not lace the video coax cable together (in parallel) with high current conductors, particularly AC power type wires such as 115 Vac 400 Hz or 60Hz.

3.1.4. Electrical Bonding Recommendation

If the Sensor is not bonded electrically via its mounting holes directly to a metal aircraft structure, then electrically bond them to the metal aircraft structure with a heavy bonding wire (or grounding braid) from an unused mounting hole.

3.2. Recommended Installation Procedure

Do not connect the input connector to the Sensor.

Switch "ON" the circuit breaker and the "ON/OFF" switch to the Max-Viz 2300 system. Verify and measure the +28 VDC between pins 1 and 2 and pins 3 and 4 of the Sensor input connector. Ensure voltage within +/- 2 VDC from normal. Switch "OFF" the circuit breaker and the "ON/OFF" switch to the MAX-VIZ 2300 system.

Connect the coax video cable to the display. Connect the Sensor input connector. Switch the input power circuit breaker and "ON/OFF" switch to "ON". Observe the "OK" message on the display.

After the "OK" message on the display is extinguished, observe that the infrared video image appears on the display with no distracting RFI noise pick-up.

At five-minute intervals the system will perform a self calibration (non-uniformity correction - NUC) and the video will momentarily go blank. This is normal. If an appropriate switch is installed, the NUC function can be manually controlled.

3.3. Installation Assistance

If you require installation assistance, and it is a certified installation, contact the type design holder. If it is a new or non-certified installation, contact Max-Viz, Inc. customer.serviceMV@astronics.com for technical support.

4. OPERATION

Operationally, the Max-Viz 2300 is used as a supplemental display to enhance the view of the outside world. It uses an infrared (IR) sensor to provide an additional visual perspective. The Max-Viz 2300 is particularly effective at night, in smoke, haze, and in smog. It is also effective in some conditions of rain, snow, and fog.

EVS improves the pilot's ability to see:

- ground vehicles and other ground-based equipment/obstacles
- aircraft on taxi-ways and runways
- other traffic during takeoff, approach, and landing
- the runway and terrain features during climb, descent, and low altitude maneuvering
- runway and taxi lights

The EVS system is also valuable as an aid in ground navigation, and can be used, at the pilot's option, throughout the full mission profile. EVS use is straightforward and does not increase the pilot's workload. The system is normally turned on by use of the "ON/OFF" switch located in the cockpit or by the "ON/OFF" switch on the display.

Upon power-up the Sensor requires approximately thirty (30) seconds to produce a useable image. At the end of this time period, a blank gray screen is displayed for approximately five (5) seconds followed by the message "OK". During the next two (2) minutes the display will blank momentarily for periodic NUC cycles after which a useable image appears. The automatic NUC cycle is at 5 minute internals after this startup sequence. The image generated is a monochrome (i.e., black and white) image. Normally the hotter an object is the whiter it appears on the display. This is known as "white hot" polarity.

The display should be adjusted for optimum brightness and contrast, and readjusted only during relatively benign phases of flight or periods of low workload. The image then should be cross checked in a manner similar to other cockpit displays, using short dwell times and appropriate cockpit priorities.

To optimize the IR image the EVS system periodically recalibrates itself. The recalibration process is known as "Non-Uniformity Correction" (NUC). NUC can be observed on the display as a momentary image interruption with "CAL" displayed. The shutter closes for approximately one (1) second during the NUC process, which happens every five (5) minutes or when manually activated, if an appropriate switch is installed in the cockpit.

5. MAINTENANCE

The Sensor may be viewed as a sealed "black box" where no field maintenance, repair, or upgrade is performed. All such activities are conducted at Max-Viz, Inc.

To ensure your system will be covered under warranty, fill out and submit Max-Viz Warranty Registration Form 3204-00042 at the time of system installation.

If you have difficulties operating the system, first contact your authorized Max-Viz dealer for technical support. They will contact the type certificate holder, if it is a certified installation. The type certificate holder will contact Max-Viz as necessary. If it is not a certified installation, the dealer will contact Max-Viz.

If it is determined the Max-Viz 2300 must be returned for service or maintenance, Max-Viz will issue a Return Material Authorization (RMA). Fill out Max-Viz Customer Service Request Form 3204-00043, and submit it to receive a RMA. After receipt of the RMA, return the system to the address in Section 7.

A copy of the Customer Service Request Form and Warranty Registration Form are included at the end of this manual, but are also available at www.max-viz.com.

6. WARNINGS, CAUTIONS, AND GUIDANCE

6.1. Electromagnetic Interference

The Max-Viz 2300 system is qualified (RTCA/DO-160) to operate in normal aircraft EMI environments. ***When installing the system, be sure that the Sensor window is not installed in close proximity to high power EMI transmitters, such as transponders.*** High energy transmitters mounted directly in front of the germanium lens may cause video disturbance.

Particular attention must be taken in routing the video coax cable through the aircraft structure to avoid potential RFI from noise items. It is highly recommended to avoid routing the video coax in close proximity to electrical noise sources such as motors, generators, transmitters, etc. Do not lace the video coax cable together (in parallel) with high current conductors, particularly AC power type wires such as 115 Vac 400 Hz or 60Hz.

6.2. Germanium Window Breakage

The Sensor window is made of Germanium. If this window is ever broken, use extreme caution when handling broken germanium shards or dust. ***Always use gloves and masks when handling broken germanium material.***

6.3. Germanium Window Cleaning

In contrast to visible light energy, infrared energy typically passes through dirt or bug-debris build-up on the window. As such, the Sensor window requires only occasional cleaning with mild liquid soap and water or isopropyl alcohol, and a soft cloth.

Do not use abrasive cleansers or cleaning pads on the germanium window. Abrasive cleaning can damage the window coating. The use of products such as Corrosion X can damage the RTV seals and coating on the germanium window. ***Do not use any cleansers with ammonia.*** Ammonia will remove the window coating.

6.4. Ice Effects and Body Heaters

During in-flight use, the Sensor uses heaters to keep ice from building up over the window. If the heaters fail and ice builds up, infrared energy will be unable to pass through the ice, and the image will begin to fade. If the heaters fail, EVS use should be discontinued and the Sensor should be returned to the factory for service. (If the Sensor is iced over on a cold winter morning before start-up, it may take a few minutes before the ice melts off and an image appears). ***Please use caution when handling the Sensor during cold weather operation. Note: the Sensor could be warm to the touch (25 degrees Celsius).***

6.5. Image Quality and Interpretation

Independent of the operation of the Sensor, image quality is a function of target size, target temperature, background temperature, and atmospheric attenuation from particles or moisture in the air. ***As such, it is important to know that the quality of the image will appear different as these variables change.*** If the video image appears clear in the cool morning and a little "washed out" on a hot/humid summer afternoon, the difference is probably caused by changes in the infrared environment, and not from changes in the operation of the system.

6.6. Nitrogen Added to Sensor

The Sensor is sealed at the factory and filled with nitrogen to eliminate moisture. If the Sensor is opened, the nitrogen will be lost. ***Do not open the Sensor during system installation or maintenance.***

6.7. Non-Uniformity Correction (NUC)

The Sensor has a 640 x 480 pixel LWIR sensor array. At five-minute intervals the system automatically performs a Non-Uniformity Correction (NUC), where an internal shutter assembly closes, to give the array a standard temperature target for array correction and re-calibration. ***During the NUC cycle, the video image is interrupted for approximately one (1) second.***

6.8. Video Signal Interruption/ Improper Display Settings

If the video signal is ever completely interrupted, the display may appear as a solid field (e.g., gray, white, or blue, etc.) and the message "no video" may appear, depending on the display, to indicate a video failure.

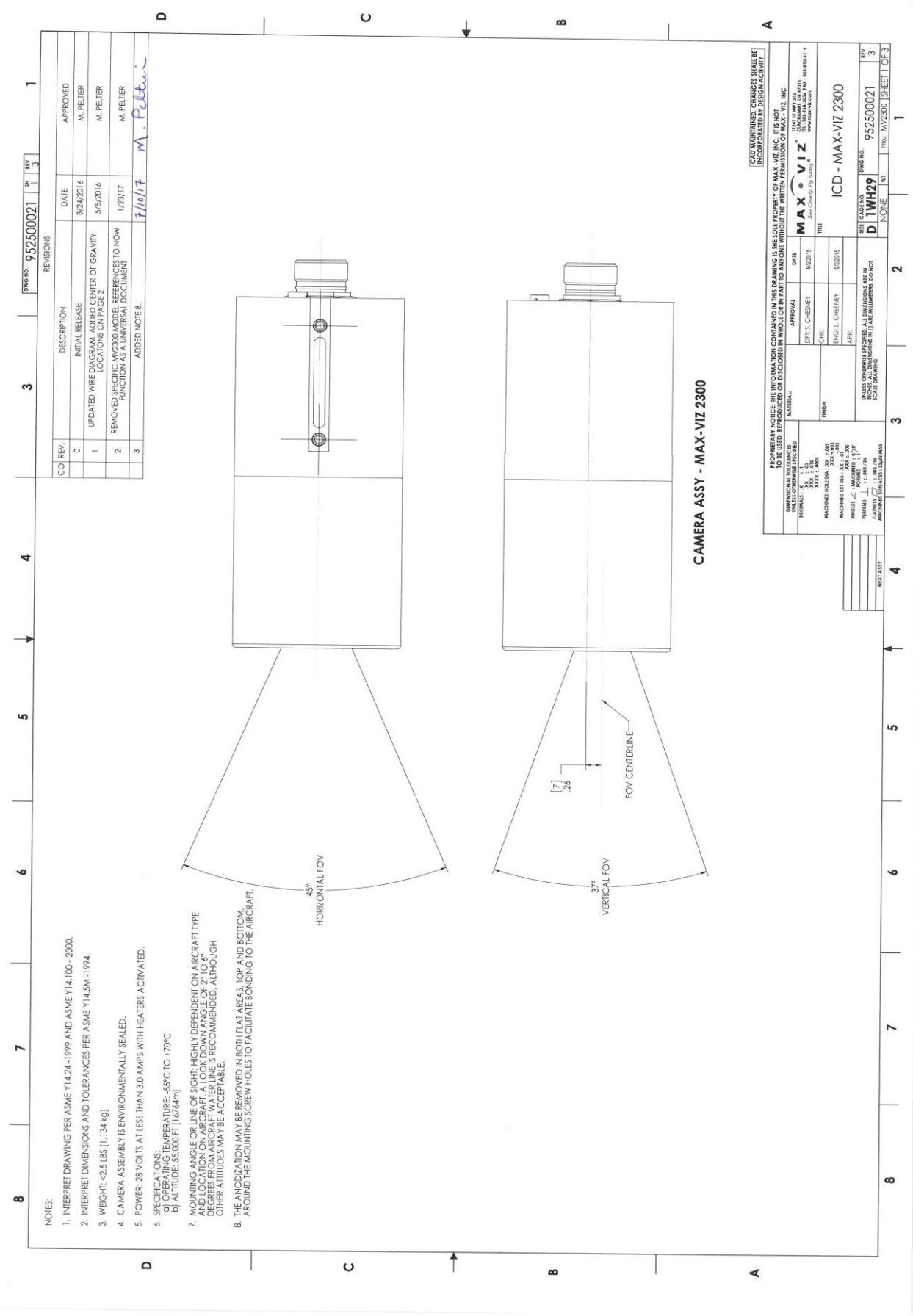
Please also note; if the brightness and contrast settings on the video display are not set properly, the image will be degraded, or possibly even displayed as solid black or solid white. ***Following initial power-up of the system, always adjust brightness and contrast settings to obtain the best image.***

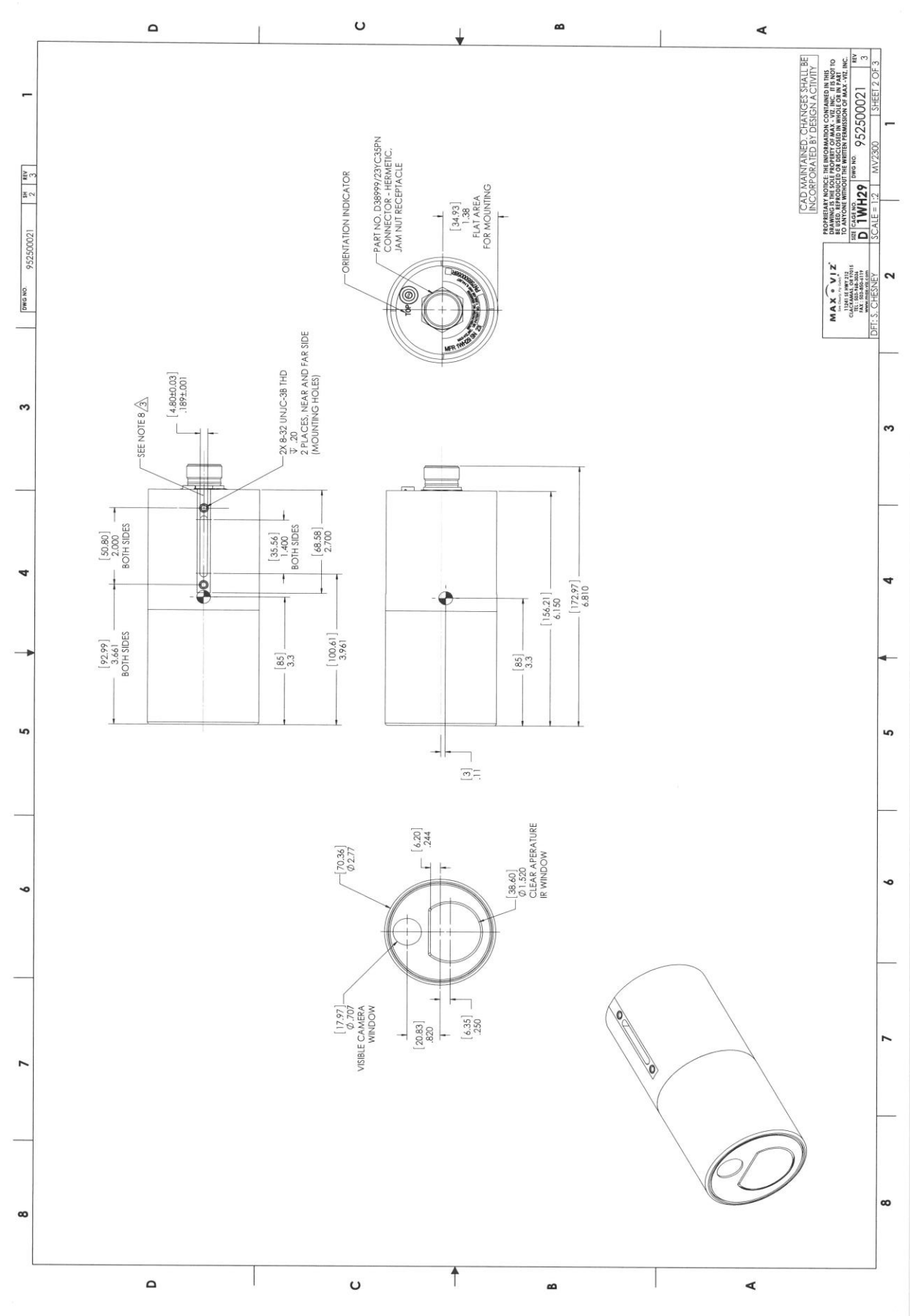
7. MAX-VIZ, INC. CONTACT INFORMATION

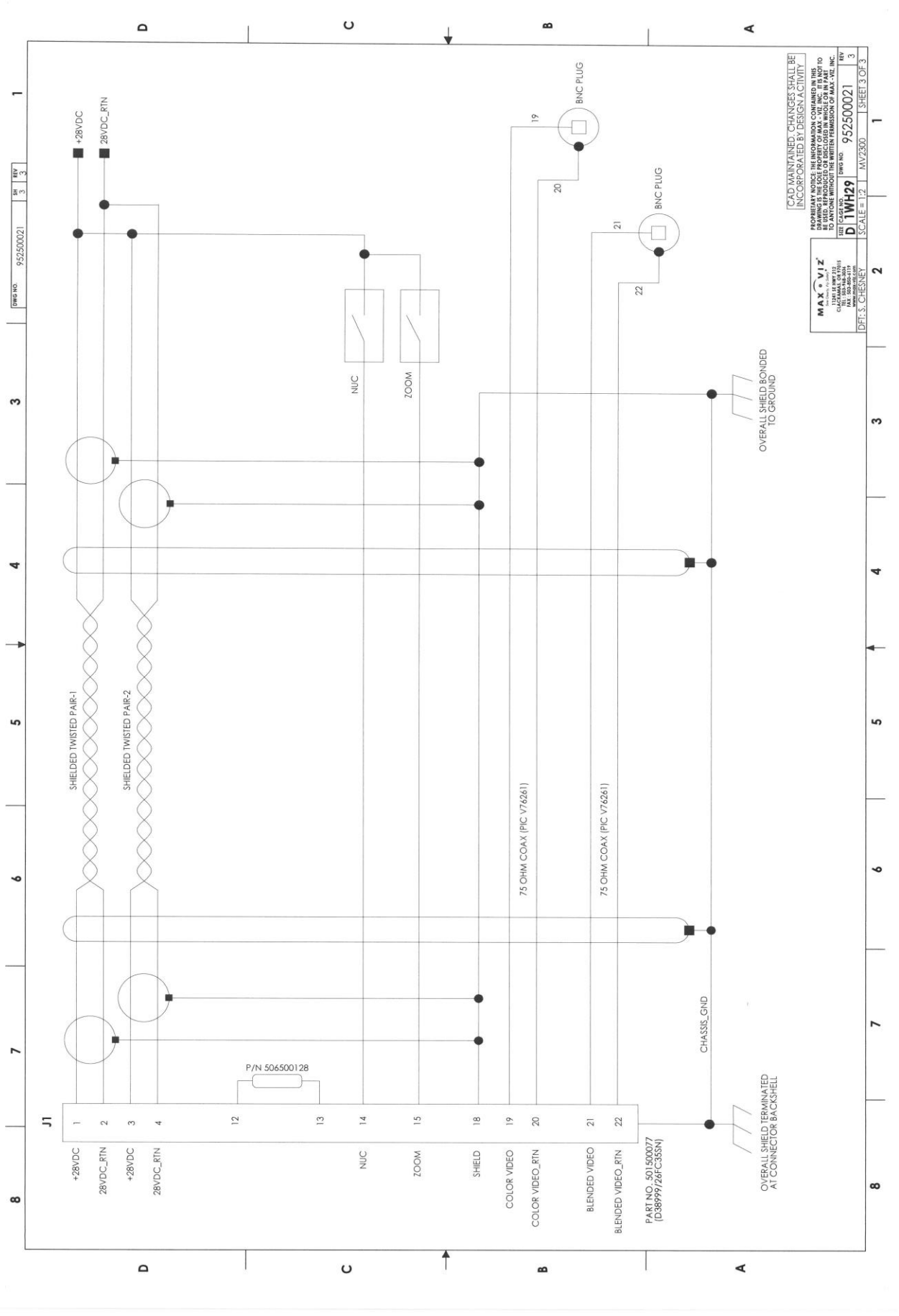
Astronics Max-Viz
11241 SE Highway 212
Clackamas, Oregon 97015 USA
Office:(503) 968-3036
Email: customer.servicemv@astronics.com
Website: www.max-viz.com

APPENDIX A

ICD MAX-VIZ 2300: 952500021


DWG NO. 952500021
REVISIONS
CO REV. DESCRIPTION DATE APPROVED
0 INITIAL RELEASE 3/24/2016 M. PELTIER
1 UPDATED WIRE DIAGRAM, ADDED CENTER OF GRAVITY LOCATONS ON PAGE 2. 5/5/2016 M. PELTIER
2 REMOVED SPECIFIC MV2300 MODEL REFERNCES TO NOW FUNCTION AS A UNIVERSAL DOCUMENT 1/23/17 M. PELTIER
3 ADDED NOTE 8. 7/10/17 M. Peltier
NOTES:
1. INTERPRET DRAWING PER ASME Y14.24 -1999 AND ASME Y14.100 - 2000.
2. INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M -1994.
3. WEIGHT: <2.5 LBS [1.134 kg]
4. CAMERA ASSEMBLY IS ENVIRONMENTALLY SEALED.
5. POWER: 28 VOLTS AT LESS THAN 3.0 AMPS WITH HEATERS ACTIVATED.
6. SPECIFICATIONS:
a) OPERATING TEMPERATURE: -55°C TO +70°C
b) ALTITUDE: 55,000 FT [16764m]
7. MOUNTING ANGLE OR LINE OF SIGHT: HIGHLY DEPENDENT ON AIRCRAFT TYPE AND LOCATION ON AIRCRAFT. A LOOK DOWN ANGLE OF 2° TO 6° DEGREES FROM AIRCRAFT WATER LINE IS RECOMMENDED. ALTHOUGH OTHER ATTITUDES MAY BE ACCEPTABLE.
8. THE ANODIZATION MAY BE REMOVED IN BOTH FLAT AREAS, TOP AND BOTTOM, AROUND THE MOUNTING SCREW HOLES TO FACILITATE BONDING TO THE AIRCRAFT.
45° HORIZONTAL FOV
37° VERTICAL FOV
[7] .26
FOV CENTERLINE
CAMERA ASSY - MAX-VIZ 2300
PROPRIETARY NOTICE: THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF MAX - VIZ, INC. IT IS NOT TO BE USED, REPRODUCED OR DISCLOSED IN WHOLE OR IN PART TO ANYONE WITHOUT THE WRITTEN PERMISSION OF MAX - VIZ, INC.
CAD MAINTAINED. CHANGES SHALL BE INCORPORATED BY DESIGN ACTIVITY
APPROVAL DATE
DFT: S. CHESNEY 9/2/2015
CHK:
ENG: S. CHESNEY 9/2/2015
APP:
MATERIAL:
FINISH
UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS ARE IN INCHES. TOLERANCE IN [ ] ARE MILLIMETERS. DO NOT SCALE DRAWING
NEXT ASSY
MAX • VIZ See Clearly, Fly Safely
11241 SE HWY 212 CLACKAMAS, OR 97015 TEL: 503-659-4118 FAX: 503-659-4119 www.max-viz.com
TITLE
ICD - MAX-VIZ 2300
SIZE D
CAGE NO. 1WH29
DWG NO. 952500021
REV 3
NONE
WT
PROJ. MV2300
SHEET 1 OF 3


ORIENTATION INDICATOR
PART NO. D38999/23YC35PN
CONNECTOR - HERMETIC,
JAM NUT RECEPTACLE
[34.93]
1.38
FLAT AREA
FOR MOUNTING
SEE NOTE 8
[4.80±0.03]
.189±.001
2X 8-32 UNJC-3B THD
↧ .20
2 PLACES, NEAR AND FAR SIDE
(MOUNTING HOLES)
[50.80]
2.000
BOTH SIDES
[35.56]
1.400
BOTH SIDES
[68.58]
2.700
[92.99]
3.661
BOTH SIDES
[85]
3.3
[100.61]
3.961
[156.21]
6.150
[172.97]
6.810
[3]
.11
[70.36]
Ø2.77
[6.20]
.244
[38.60]
Ø1.520
CLEAR APERATURE
IR WINDOW
[17.97]
Ø.707
VISIBLE CAMERA
WINDOW
[20.83]
.820
[6.35]
.250
DWG NO. 952500021
SH 2
REV 3
CAD MAINTAINED. CHANGES SHALL BE INCORPORATED BY DESIGN ACTIVITY
PROPRIETARY NOTICE: THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF MAX - VIZ, INC. IT IS NOT TO BE USED, COPIED OR DISCLOSED IN WHOLE OR IN PART TO ANYONE WITHOUT THE WRITTEN PERMISSION OF MAX - VIZ, INC.
SIZE D
CAGE NO. 1WH29
DWG NO. 952500021
REV 3
SCALE = 1:2
MV2300
SHEET 2 OF 3
DFT: S. CHESNEY
MAX • VIZ
11241 SE HWY 212
CLACKAMAS, OR 97015
TEL: 503-348-3019
FAX: 503-348-3018
www.max-viz.com


+28VDC
28VDC_RTN
SHIELDED TWISTED PAIR-1
SHIELDED TWISTED PAIR-2
NUC
ZOOM
BNC PLUG
BNC PLUG
75 OHM COAX (PIC V76261)
75 OHM COAX (PIC V76261)
OVERALL SHIELD BONDED TO GROUND
CHASSIS_GND
P/N 506500128
J1
+28VDC
28VDC_RTN
+28VDC
28VDC_RTN
NUC
ZOOM
SHIELD
COLOR VIDEO
COLOR VIDEO_RTN
BLENDED VIDEO
BLENDED VIDEO_RTN
PART NO. 501500077 (D38999/26FC35SN)
OVERALL SHIELD TERMINATED AT CONNECTOR BACKSHELL
CAD MAINTAINED; CHANGES SHALL BE INCORPORATED BY DESIGN ACTIVITY
PROPRIETARY NOTICE: THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF MAX-VIZ, INC. IT IS NOT TO BE USED, REPRODUCED OR DISCLOSED IN WHOLE OR IN PART TO ANYONE WITHOUT THE WRITTEN PERMISSION OF MAX-VIZ, INC.
MAX-VIZ
SIZE D
CAGE NO. 1WH29
DWG NO. 952500021
REV 3
SCALE = 1:2
MV2300
SHEET 3 OF 3
DFF: S. CHESNEY
DWG NO. 952500021
SH 3
REV 3

Form 3204-00042, "Warranty Registration Form"

MAX • VIZ®

See Clearly, Fly Safely®

WARRANTY REGISTRATION FORM

Please complete this form and return to:

Astronics Max-Viz
Attn: Customer Service
11241 SE Highway 212, Clackamas, Oregon 97015 USA
Phone: 503-968-3036
Email: customer.servicemv@astronics.com Website: www.max-viz.com

Registered Owner Information		***Installing Agent***	
Name:		Name:	
Address:		Address:	
Country:		Work Order:	
Phone:		Phone:	
Fax:		Fax:	
Contact Name:		Contact Name:	
Email:		Email:	
Operator (if other than owner):			
Aircraft Information			
Manufacturer:		Reg. No:	
Model No.:		Serial No:	
Warranty Start Date: (mm/dd/yy)		**Aircraft Hours:**	
Installation Date: (mm/dd/yy)		**Aircraft Hours:**	
Max-Viz Product Information			
Model No:		Serial No:	
Model No:		Serial No:	

Form 3204-00043, "Customer Service Request"

MAX • VIZ®
See Clearly, Fly Safely®

CUSTOMER SERVICE REQUEST FORM / RETURN MATERIAL AUTHORIZATION

Please complete this form and return to:

Astronics Max-Viz
Attn: Customer Service
11241 SE Highway 212, Clackamas, Oregon 97015 USA
Phone: 503-968-3036
Email: customer.servicemv@astronics.com Website: www.max-viz.com

RMA#		PO#	
Registered Owner Information		**Completion Center**	
Name		Name	
Address		Address	
Country		Work Order	
Contact Name		Contact Name	
Phone or Fax		Phone or Fax	
E-mail		E-mail	
Operator (if other than owner):			
Aircraft Information			
Manufacturer		Reg. No.	
Model No.		Serial No.	
		Aircraft Hours	
Description of Service			
EVS Model No.	Serial No.	Date:	
Description of Service Requested or Problem to be Fixed:			

APPENDIX B - EMI TEST PROCEDURE

1. This appendix contains procedures for assuring EMC (Electromagnetic Compatibility) between an installed infrared camera system and previously installed equipment. This equipment includes all existing flight, navigation, and power plant instruments plus other electronic systems onboard the aircraft. It is necessary to conduct this test due to possible variations in actual aircraft electrical component installations.

2. For this test, the EMI source will be the infrared imaging system, installed according to the applicable STC.

3. These tests are a basic compatibility check to ensure that there are no adverse indications or malfunction generated due to the addition of the EVS onto a subject aircraft. These tests are a basic set of guidance standards, actual STC or other formal installation documentation would supersede this appendix as official guidance approved by the FAA or other regulatory authority.

REQUIRED EQUIPMENT/PERSONNEL

An appropriate test administrator (usually an avionics installer and / or a qualified pilot) familiar with both the aircraft systems and installed equipment should conduct this test.

TEST PROCEDURE

Perform the following steps with engines running at ground idle RPM. The aircraft must supply all electrical power.

1. Position the aircraft away from potential EMI/RFI sources, like buildings, radio towers, and high power electrical lights.

2. Operate all IR system components. Existing equipment may be tested in any order and/or in groups. All monitored equipment/instruments must perform within their allowable tolerance for satisfactory results. Unintentional responses, changes in operating mode, or intermittent behaviors should be resolved prior to EVS operational use. Any EVS induced hum, or transient noise in any audio system shall require acceptance by the test administrator. Existing cockpit displays shall not be affected.

3. Refer to the attached test matrix for test procedures, adding installed equipment/instrumentation as needed. Mark N/A if subject equipment is not installed.

4. Document test results in the test matrix. Conduct additional testing as needed to assure system function. Document further testing and/or necessary corrections in the comments section.

TEST MATRIX

VHF COM

Monitor the indicated frequencies and others as needed for broken squelch. Transmit and Receive at each frequency to determine communication Integrity.

VOR/NAV

Check each VOR receiver audio. Monitor a VOR station at the four cardinal bearings. Verify effects. (PASS/FAIL). Verify audio clear of objectionable interference. Record station ID/frequency.

ADF/NAV

Exercise all available modes of each ADF verify that the proper bearing is displayed. Verify audio is clear of objectionable Interference. Record the station ID/frequency.

INSTRUMENT LANDING SYSTEM

Monitor the ILS. Verify that the proper localizer, Glide slope, and marker beacon indications are displayed. Verify that the audio is clear of objectionable Interference. Record the station ID/frequency.

	COM 1		COM 2		COM 3	
	Pass	Fail	Pass	Fail	Pass	Fail
118.000 Mhz						
122.750 Mhz						
127.500 Mhz						
132.250 Mhz						
136.975 Mhz						

Station			Frequency:			
	NAV 1		NAV 2		NAV 3	
Bearing (Deg.)	Pass	Fail	Pass	Fail	Pass	Fail
0						
90						
180						
270						

Station:		Frequency:			
ADF 1		ADF 2		ADF 3	
Pass	Fail	Pass	Fail	Pass	Fail

Station			Frequency:			
	NAV 1		NAV 2		NAV 3	
Bearing (Deg.)	Pass	Fail	Pass	Fail	Pass	Fail
Localizer						
Glide Slope						
Marker Beacon						

(Figure 1)