

Installation and Operating Manual

Rev A

Jupiter Avionics Corporation 1959 Kirschner Road Kelowna BC Canada V1Y 4N7 Tel: +1 778 478 2232 Toll-Free: 1 855 478 2232

www.jupiteravionics.com



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RECORD OF REVISIONS					
Revision	ECR				
Α	Feb 2017	Description Initial release, Serial number 1001 and higher.	3827		

Prepared:	JAC Checked:	Approved:
МРВ	(03-02-17) AH	(03-02-17) KDV

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SECTION 1 - DESCRIPTION

1.1 System Overview

The TSPR-JRAC2 Production Test Set connects a JRAC2 series audio controller and compatible products to the various test loads and test equipment needed to perform the production acceptance test procedure. The TSPR-JRAC2 allows for manual testing or automated testing via a multi-connector automated test interface.

1.2 Features Overview

The TSPR-JRAC2 Production Test Set is a 19 inch rack mount test panel that connects the unit under test (UUT) to test equipment via the D-sub Cables. Additional D-subminiature connectors allow for an automated test equipment interface. BNC connectors provide test equipment access for each input, output and bi-directional signal. Headset jack connectors for each microphone and phones pair allow for a standard aviation headset connection. Banana jacks accept power supply inputs and provide a connection to keyline outputs. Audio 3.5mm jacks connect to both the unit under test and a computer. Switches allow for audio selection, load selection, on/off control, keyline activation and mode selection. LEDs indicate power status and discrete or keyline outputs from the unit under test.

1.3 Specifications

1.3.1 Mechanical Specifications

Height	12.25 in [311.2 mm] max
Behind panel depth	2.00 in [50.8 mm] max
Overall depth including front panel components	3.00 in [76.2 mm] max
Front panel width	19.0 in [482.6 mm] max
Weight	8.65 lbs (3.9 kg) max
Enclosure Material	brushed aluminum with conversion coating
Connectors for JRAC2 (6):	1 ea. 4 pole 3.5mm stereo jack 2 ea. 62-pin D-Sub male 1 ea. 26-pin D-Sub male 1 ea. 25-pin D-Sub male 1 ea. 15-pin D-Sub male
Mounting	4 ea. 10-32 x 0.5 screws (19 inch rack panel)
Bonding	\leq 2.5 m Ω
Front panel legends	white markings on black background

1.3.2 Test Cables

The TSPR-JRAC2 includes five Production Test Set Cables:

Quantity	Description	JAC Part #
1	JRAC2 J1 to TSPR-JRAC2 J18	CAB-TSPR-0028
1	JRAC2 J2 to TSPR-JRAC2 J28	CAB-TSPR-0029
1	JRAC2 J3 to TSPR-JRAC2 J63	CAB-TSPR-0030
1	JA23 J2 to TSPR-JRAC2 J93	CAB-TSPR-0037
1	JRAC2 J6 to TSPR-JRAC2 J80 to JA37	CAB-TSPR-0038

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SECTION 2 – INSTALLATION

2.1 Introduction

This section contains unpacking and inspection procedures, installation information, and post-installation checks.

2.2 Unpacking and Inspecting Equipment

Unpack the equipment carefully. Check for shipping damage and report any problems to the relevant carrier. Confirm that the Authorized Release Certificate or Certificate of Conformance is included. Complete the on-line warranty card from the Jupiter Avionics Corporation (JAC) website - www.jupiteravionics.com/warranty

2.2.1 Warranty

This product manufactured by JAC is warranted to be free of defects in workmanship or performance for 2 years from the date of installation by an approved JAC dealer or agency. This warranty covers the cost of all materials and labour to repair or replace the unit, but does not include the cost of transporting the defective unit to and from JAC or its designated warranty repair centre, or of removing and replacing the defective unit in the aircraft. This warranty does not cover failures due to abuse, misuse, accident, or unauthorized alteration or repairs.

If the on-line warranty card is not completed, the product will be warranted from the date of manufacture.

Contact JAC for return authorization, and for any questions regarding this warranty and how it applies to your unit(s). JAC is the final arbiter concerning warranty issues.

2.3 Installation Procedures



WARNING: Loud noise can cause hearing damage. Set the headset volume to minimum before conducting tests, and slowly increase the volume to a comfortable listening level.



CAUTION: The power input circuitry of the unit may be damaged if the installation does not conform to the wiring instructions in this manual.

2.3.1 Mechanical Installation

The TSPR-JA9X can be mounted in a 19" test rack in any attitude and location with adequate space for the front panel and sufficient clearance for the connector and wiring harness. It requires no direct cooling.

2.4 Installation Drawings

The Mechanical Installation drawing can be found in Appendix A of this manual.

SECTION 3 – OPERATION

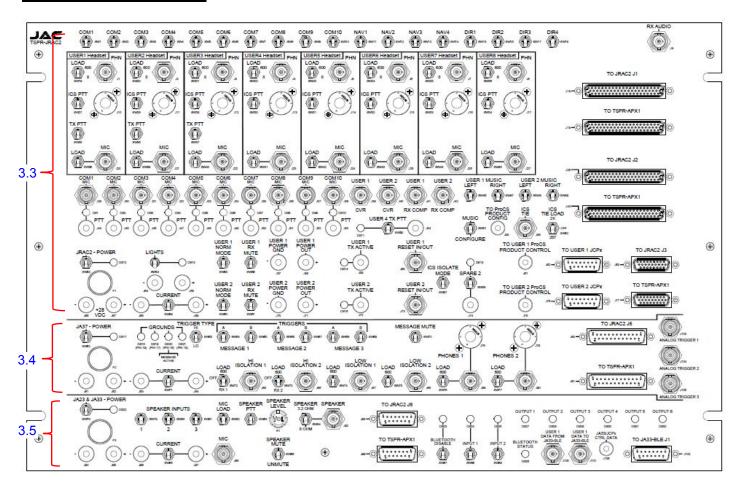
3.1 Introduction

The switches, connectors and annunciators of the TSPR-JRAC2 are described in this section.



Note: The connection and operating instructions for the TSPR-JRAC2 depend upon the unit under test (UUT). All connection information can be found in the Acceptance Test Procedure for the relevant product in the Setup Diagram and Connection Setup Procedure sections.

3.2 Front Panel



Each part of the front panel will be described separately in the following sections.

The JRAC2 information is shown in Section 3.3.

Refer to section 3.4 for the JA37 and section 3.5 for the JA23 & JA33



3.3 JRAC2 Section

3.3.1 POWER



The **JRAC2 - POWER** switch (SW53) is a two-position, single pole toggle switch for power on/off. Annunciator DS12 will illuminate green when the unit is connected to a power supply and the switch is in the on (up) position.

The fuse holder (F1) contains the power input fuse (glass body Slo-Blo, 3 Amp, 0.25in dia x 1.25in long).

Two banana jack connectors (marked +28 VDC) provide a power supply connection. The left (negative -) power connector (J66) is black, and the right (positive +) power connector (J67) is red.

3.3.2 LIGHTS



The **LIGHTS** switch (SW54) is a two-position, single pole toggle switch used for products with panel lights. When the switch is in the 'up' position, the lights will be on, and the annunciator DS13 will illuminate green. When the switch is in the 'down' position, the lights will be off and the annunciator will be dark.

Two banana jack connectors (J64 and J65) provide a lights power supply input and a lights ground.

3.3.3 CURRENT



Two banana jack connectors provide a power supply current measurement output. The left (negative -) current connector (J68) is black, and the right (positive +) current connector (J69) is red.

When **CURRENT** switch SW59 is up, the current can be checked through an external current measurement device.

3.3.4 USER Mode and Mute

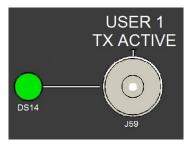


The **USER 1 NORM MODE** switch SW55 is a two position single pole toggle switch, used to select Normal mode when in the up position. The **USER 1 RX MUTE** switch SW56 is used to mute receive audio for USER 1.

Connectors J57 and J58 are used to provide USER 1 POWER GROUND (-) and USER 1 POWER OUT (+) respectively. The voltage can be checked through an external voltage measurement device.

Below these are the equivalent USER 2 switches and connectors: **USER 2 NORM MODE** (SW60) **USER 2 RX MUTE** (SW61) **USER 2 POWER GND** (J70) and **USER 2 POWER OUT** (71)

3.3.5 USER TX ACTIVE



The **USER 1 TX ACTIVE** connector J59 is linked by a line to its associated annunciator DS14, and is used to monitor USER 1 transmit activity.

The **USER 2 TX ACTIVE** connector J72 and annunciator DS16 are situated immediately below, and operate in the same manner.

3.3.7 ICS ISOLATE MODE



The ICS ISOLATE MODE switch is a two position single pole toggle switch labelled SW57, and is used to place the UUT into ICS ISOLATE mode.

3.3.6 USER RESET IN/OUT



The **USER 1 RESET IN/OUT** is a panel mount female BNC connector labelled J60, and is used to monitor the UUT RESET output, or to reset the UUT.

Below this, the identical **USER 2 RESET IN/OUT** connector is labelled J73.

3.3.8 SPARE 2



The **SPARE 2** switch is a two position single pole toggle switch labelled SW58.

It is connected by a line to its corresponding annunciator DS15, and to a black single conductor banana jack labelled J74, which is used to ground Pin 24 on J63 and J77.

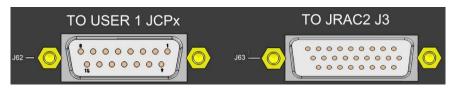
3.3.9 ProCS PRODUCT CONTROL



The **TO USER 1 ProCS PRODUCT CONTROL** connector J61 is a four contact 3.5 mm panel mounted jack.

Immediately below it is the **TO USER 2 ProCS PRODUCT CONTROL** connector J75, which is used to connect a PC running ProCS™ to the UUT.

3.3.10 'TO' D-Subminiature Connectors



TO USER 1 JCPx is a 15 socket D-subminiature connector labelled J62 used to connect a JCPx control panel to the UUT.

TO JRAC2 J3 is a 26 socket high density D-subminiature connector labelled J63, used for automatic testing purposes.

TO USER 2 JCPx (J76) and TO TSPR-APX1 (J77) are situated directly below.



3.3.11 COM MICS and PTT



The **COM 1 MIC** is a black BNC female connector labelled J29. It is linked by a line to its associated annunciator DS1, and to a black single conductor panel mount banana jack marked **PTT** and labelled J44.

The MIC connector is used to monitor the UUT transmit audio.

The **PTT** connector and annunciator are used to monitor the transmit Press to Talk keyline from the UUT.

COM 2 MIC is J30, with annunciator DS2 and PTT connector J45.

COM 3 MIC is J31, with annunciator DS3 and PTT connector J46.

COM 4 MIC is J32, with annunciator DS4 and PTT connector J47.

COM 5 MIC is J33, with annunciator DS5 and PTT connector J48.

COM 6 MIC is J34, with annunciator DS6 and PTT connector J49.

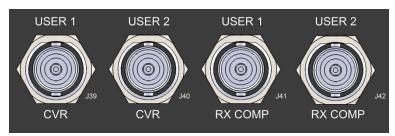
COM 7 MIC is J35, with annunciator DS7 and PTT connector J50.

COM 8 MIC is J36, with annunciator DS8 and PTT connector J51.

COM 9 MIC is J37, with annunciator DS9 and PTT connector J52.

COM 10 MIC is J38, with annunciator DS10 and PTT connector J53.

3.3.12 CVR and RX COMP



These four female BNC panel mount connectors are marked USER 1 CVR (J39), USER 2 CVR (J40), USER 1 RX COMP (J41) and USER 2 RX COMP (J42).

These connectors are used to monitor CVR and RX COMP signals from the UUT

3.3.13 USER MUSIC



These switches are used to route music audio to the UUT.

The **USER 1 MUSIC** switches are labelled SW46 (**LEFT**) and SW47 (**RIGHT**).

The **USER 2 MUSIC** switches are situated to the right of the USER 1 MUSIC switches, and are labelled SW48 (**LEFT**) and SW49 (**RIGHT**).



3.3.14 MUSIC/CONFIGURE Switch



The MUSIC/CONFIGURE switch is a two position 3-pole toggle switch, labelled SW51.

When the switch is set to the up position, the music audio is routed from the RX AUDIO connector to the USER 1 music left and right inputs on the UUT.

When the front panel configuration switch is set to the down position, the configuration data lines are connected from the JA99 configuration connector to the UUT connector.

3.3.15 TO ProCS PRODUCT CONFIG



The **TO ProCS PRODUCT CONFIG** interface is a four contact 3.5 mm panel mount jack labelled J55.

This connector is used to connect a PC running ProCS™ to the UUT.

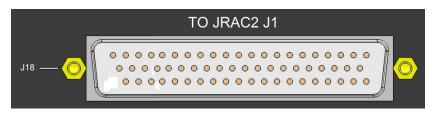
3.2.16 ICS TIE and TIE LOAD



The **ICS TIE** interface is a black BNC connector labelled J56.

The ICS TIE LOAD switch provides selection of an impedance of $2K\Omega \pm 10\%$, $287\Omega \pm 10\%$ or no load (OFF) to the UUT interface connector contacts.

3.3.17 62 Socket D-Subminiature Connectors



There are four 62-socket high density D-Subminiature connectors on the right hand side of the TSPR-JRAC2. Each one is individually labelled and marked.

The first connector is J18, labelled TO JRAC2 J1 (shown above).

The second connector is J19, labelled TO TSPR-APX1.

The third connector is J28, labelled TO JRAC2 J2.

The fourth connector is J43, labelled TO TSPR-APX1.

3.3.18 RX AUDIO connector and Switches



The RX AUDIO switches are eighteen two-position 2-pole toggle switches. When a switch is in the up position, the relevant COM, NAV or DIR is connected, and when in the down position, it is disconnected.

The switches are marked COM1 to COM10, NAV1 to NAV4, and DIR1 to DIR4, and are labelled SW1 to SW18

To the right of the switches is a female BNC receive audio connector marked **RX AUDIO** (J9) to interface with an audio generator.

USER 1 and USER 2 music left and right (SW46 – SW49) are also connected to the **RX AUDIO** (J9).



3.3.19 USER Headset Controls



The **USER# Headset** controls and connectors are grouped together by headset number.

At the top of each section are a **LOAD** switch and a female BNC connector marked **PHN**. The **LOAD** switch is a three-position (center off), single pole toggle switch to select the phones load. In the up position the selected load is **600** Ω , in the down position it is **8** Ω , and the centre-off position selects No Load.

The next row has an ICS PTT switch and a four conductor headset jack.

The USER1, USER2 and USER3 sections have a TX PTT switch.

In the lowest position of each grouping are a **LOAD** switch and a female panel mount BNC connector marked **MIC**. When the **LOAD** switch is in the up position, the load is applied to the attached microphone.

The labels for the components are shown below:

USER #	LOAD	PHN	ICS PTT	Jack	TX PTT	LOAD	MIC
USER1	SW19	J1	SW27	J10	SW35	SW38	J20
USER2	SW20	J2	SW28	J11	SW36	SW39	J21
USER3	SW21	J3	SW29	J12	SW37	SW40	J22
USER4	SW22	J4	SW30	J13	N/A	SW41	J23
USER5	SW23	J5	SW31	J14	N/A	SW42	J24
USER6	SW24	J6	SW32	J15	N/A	SW43	J25
USER7	SW25	J7	SW33	J16	N/A	SW44	J26
USER8	SW26	J8	SW34	J17	N/A	SW45	J27

3.3.20 USER 4 TX PTT



The **USER 4 TX PTT** switch is a two position single pole toggle switch labelled SW60, used to activate USER 4 function on the UUT. It is linked by lines to its associated annunciator DS11, and to a black single conductor panel mount banana jack labelled J44



3.4 JA37 Section

3.4.1 <u>JA37 - POWER</u>



The **JA37 - POWER** switch (SW62) is a two-position, single pole toggle switch for power on/off. Annunciator DS17 will illuminate green when the unit is connected to a power supply and the switch is in the on (up) position.

The fuse holder (F2) contains the power input fuse (glass body Slo-Blo, 3 Amp, 0.25in dia x 1.25in long).

Two banana jack connectors provide a power supply connection. The left (negative -) power connector (J81) is black, and the right (positive +) power connector (J82) is red.

3.4.2 GROUNDS



The **GROUNDS** annunciators DS18 to DS21 are marked with their associated pin numbers and will illuminate green when the relevant pin is grounded. DS20 (Pin 16) is linked by lines to the **MESSAGE ACTIVE** legend.

3.4.3 CURRENT



Two banana jack connectors provide a power supply current measurement output. The left (negative -) current connector (J83) is black, and the right (positive +) current connector (J84) is red.

When **CURRENT** switch SW71 is up, the current can be checked through an external current measurement device.

3.4.4 MESSAGE TRIGGERS



The **MESSAGE TRIGGERS** section consists of six two-pole centre-off toggle switches (SW64 to SW69) grouped into three pairs. Each pair is marked **A** or **B** above the switch, and **MESSAGE 1**, **MESSAGE 2** or **MESSAGE 3** below the paired groups.

The **TRIGGER TYPE** is selected by a two-pole centre-off toggle switch labelled SW63 (**HI** is up and **LO** is down).

The **MESSAGE MUTE** switch is a two-pole centre-off toggle switch labelled SW70 (mute on is up and off is down).



3.4.5 ISOLATION LOADS



The **HI ISOLATION** section consists of two two-pole centre-off toggle switches (SW72 and SW73), each associated with a female BNC panel mount connector (J85 and J86) and marked **HI ISOLATION 1** and **HI ISOLATION 2**. The switches select 600Ω in the up position, **RX1** or **RX2** in the down position, and **OFF** in the centre-off position.

The **LOW ISOLATION** section consists of two single-pole two-position toggle switches (SW74 and SW75), each associated with a female BNC panel mount connector (J87 and J88) and marked **LOW ISOLATION 1** and **LOW ISOLATION 2**. The switches select **600** Ω in the up position and off in the down position.

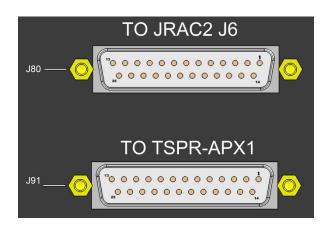
3.4.6 PHONES 1 and 2 LOADS



The **PHONES 1** section consists of a four conductor panel mount phones jack (J78) linked by a line to a female BNC panel mount connector (J89) and a single-pole two position toggle switch (SW76) labelled **LOAD**. The switch selects 600Ω in the up position and off in the down position.

The **PHONES 2** section is identical, with the phones jack (J79) linked by a line to a female BNC panel mount connector (J90) and a single-pole two position toggle switch (SW77) labelled **LOAD**. The switch selects **600** Ω in the up position and off in the down position.

3.4.7 D-Subminiature Connectors



Two 25-socket D-subminiature connectors are labelled **TO JRAC2 J6** (J80) and **TO TSPR-APX1** (J91).

3.4.8 ANALOG TRIGGERS 1 – 3



Three female panel-mount BNC connectors labelled **ANALOG TRIGGER 1** (J103), **ANALOG TRIGGER 2** (J104) and **ANALOG TRIGGER 3** (J105) are provided to interface with a signal generator.



3.5 JA23 & JA33 Section

3.5.1 JA23 & JA33 - POWER



The **JA23 & JA33 - POWER** switch SW78 is a two-position, single pole toggle switch for power on/off. Annunciator DS22 will illuminate green when the unit is connected to a power supply and the switch is in the on (up) position.

The fuse holder F3 contains the power input fuse (glass body Slo-Blo, 3 Amp, 0.25in dia x 1.25in long).

Two banana jack connectors provide a power supply connection. The left (negative -) power connector (J94) is black, and the right (positive +) power connector (J95) is red.

3.5.2 SPEAKER INPUTS



The **SPEAKER INPUTS** are three two-position, single pole toggle switches labelled SW79, SW80 and SW81, and marked 1, 2 and 3 respectively.

These switches route **RX AUDIO** (J9) to the UUT.

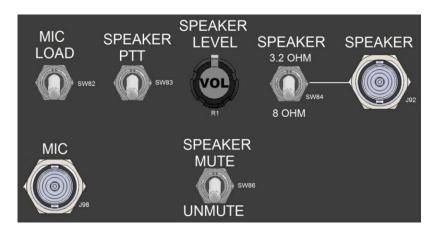
3.5.3 CURRENT



Two banana jack connectors provide a power supply current measurement output. The left (negative -) current connector (J96) is black, and the right (positive +) current connector (J97) is red.

When **CURRENT** switch SW85 is up, the current can be checked through an external current measurement device.

3.5.4 SPEAKER Switches and Connectors



MIC LOAD SW82 is a two-position single pole switch that loads the mic bias voltage during signal injection on the mic connector that activates the speaker output. SPEAKER PTT SW83 is a two-position two-pole switch.

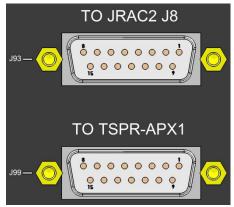
The **SPEAKER LEVEL** is controlled by a 1 $k\Omega$ panel pot (R1) marked **VOL**.

The **SPEAKER** connector J92 is a female panel mount BNC connector, linked by a line to its associated switch **SPEAKER** SW84 which is a two position centre-off toggle switch, used to select between **3.2 OHM** in the up position, **8 OHM** in the down position, and off in the centre.

The **MIC** connector is a female panel mount BNC connector, and SW86 is used to select **SPEAKER MUTE** in the up position, and **UNMUTE** in the down position.

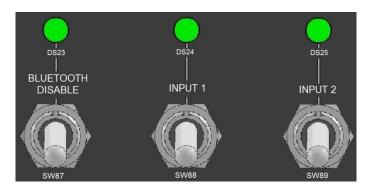


3.5.5 D-Subminiature Connectors



Two 15-socket D-subminiature connectors are labelled **TO JRAC2 J8** (J93) and **TO TSPR-APX1** (J99).

3.5.6 BLUETOOTH and INPUTS



Three two-position, single pole toggle switches allow selection of **BLUETOOTH DISABLE** (SW87), **INPUT 1** (SW88) and **INPUT 2** (SW89). Annunciators DS23, DS24 and DS25 will illuminate green to indicate the associated switch is in the up position.

3.5.7 Connectors and OUTPUT Annunciators



OUTPUT annunciators DS26 to DS32 Illuminate green when the associated output (**BLUETOOTH STATUS** and **OUTPUT 1** to **OUTPUT 6**) is active.

Two female panel mount BNC connectors are marked **USER 1 DATA FROM JA33-BLE** (J100) and **USER 1 DATA TO JA33-BLE** (J100).

A four contact 3.5mm panel mount jack (J106) provides JA33/JCPx CTRL DATA to the UUT.

A 15-socket D-subminiature connector (J102) is marked **TO JA33-BLE J1**. This connector interfaces the UUT to the Test Set.

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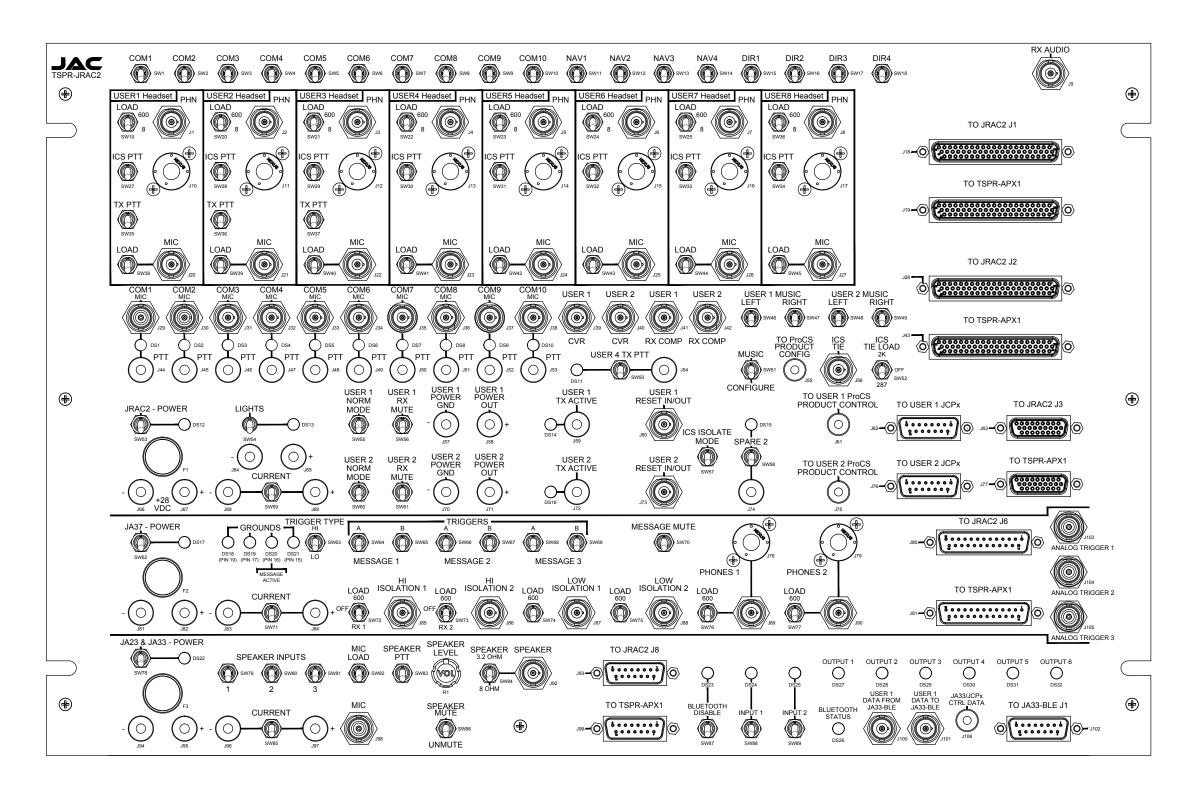
Appendix A - Installation Drawings

A1 Introduction

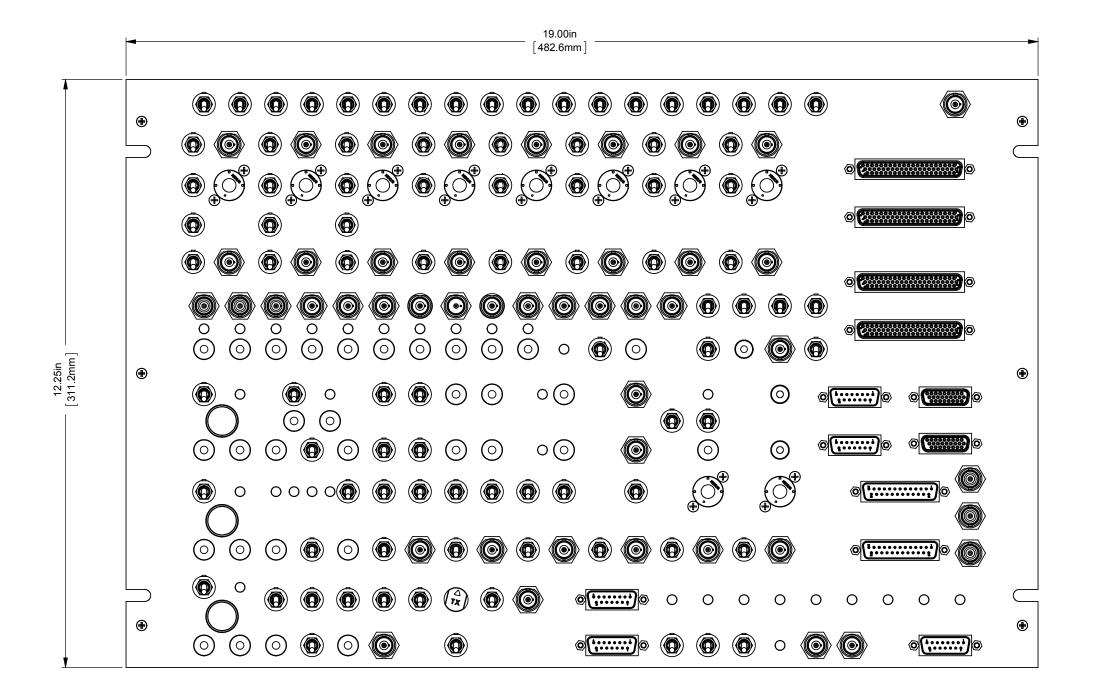
The drawings necessary for installation and troubleshooting of the TSPR-JRAC2 JRAC2 Production Test Set are in this Appendix, as listed below.

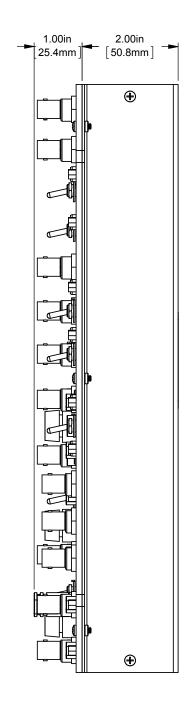
A2 Installation Drawings

DOCUMENT	
TSPR-JRAC2 Faceplate	В
TSPR-JRAC2 Mechanical Installation	Α



PREPARED	TAT		ILIDITED AVIONICS	
OUEOVED	JAC 02-24-17		JUPITER AVIONICS	
CHECKED	SRM	TITLE	JRAC2 Production Test Set	
	JAC			
APPROVED	(02-27-17) KDV	NCAGE CODE	PART NO.	SHEET
		L00N3	TSPR-JRAC2	1/1
CONFIDENTIAL & PROPRIETARY TO JUPITER AVIONICS CORP.		DOC NO.	Faceplate Rev B.dwg	
		TOT INJUNACE	Taceplate Nev D.awy	





Notes:

1. Reference TSPR-JRAC2 Faceplate Rev B.pdf for faceplate engraving.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES ANGLES ARE IN DEGREES PREPARED TAT JUPITER AVIONICS TOI FRANCES 1 DEC PLACE: ± 0.1 2 DEC PLACE: ± 0.01 3 DEC PLACE: ± 0.005 ANGLES: ± 0.5 DEG CHECKED TITLE JRAC2 Production Test Set NCAGE CODE PART NO. SHEET APPROVED TSPR-JRAC2 L00N3 1/1 MATERIAL: N/A TO JUPITER AVIONICS CORP.
TSPR-JRAC2 Mechanical Installation Rev A.SLDDRW FINISH: N/A

JUPITER AVIONICS TEMPLATE SOLIDWORKS LANDSCAPE SIZEB REV B.DRWDOT