



# User Guide

## IRIG Distribution Amplifier

Model IBU-240

P/N 019000001

Revision A

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## Revision History

REVISION	DATE	COMMENT
NC	08-31-04	Original release of IBU-240 user guide.
A	02-20-06	Section 1.1.3 Fault/Status added.

**WARNING: This unit contains lethal AC voltages. Disconnect the unit from the AC supply before removing the cover.**



**WARNING:**

The lightning flash with an arrowhead inside of an equilateral triangle is intended to alert the user to the presence of un-insulated “dangerous voltage” within the product’s enclosure. The “dangerous voltage” may be of sufficient magnitude to constitute a risk of electrical shock to people.



**CAUTION:**

The exclamation point inside of an equilateral triangle is intended to alert the user to the presence of important operation and maintenance instructions in the user guide.



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## 1 Specifications

### 1.1 Inputs

#### 1.1.1 Time Code Input

- Frequency: 300 Hz – 50 KHz
- Amplitude : 4 Vpp
- Input Impedance: 600 ohm
- Number of Inputs: 2 with auto selection and manual override from the front panel toggle switch
- Connector Type: BNC
- Isolation: transformer coupled

#### 1.1.2 Fault Discrete (Optional)

- Number of Inputs: 2
- Level: TTL
- Link selectable for active high or low
- Forces a changeover when active for on-line reference

#### 1.1.3 Fault/Status

- Connector Type: DB-9 Female
- Mating Connector: AMP P/N 747904-2

### 1.2 Outputs

#### 1.2.1 Time Code Output

- Number of Outputs: 24
- Connector Type: BNC
- Output Protection: short circuit proof
- Output Level: same as input
- Isolation: transformer coupled
- Output Impedance: 600 ohm



## 1.3 Switches and Indicators

### 1.3.1 Status LED Indicators

- Power (Green)
- Reference Input A Available (Green)
- Reference Input A Online (Green)
- Reference Input B Available (Green)
- Reference Input B Online (Green)
- Automatic Reference Selection Selected (Green)
- Fault (Red)

### 1.3.2 Environmental

- Temperature:
  - Operating: -30 to +60°C
  - Storage: -40 to +85°C
- Humidity:
  - 10 – 95% non-condensing

### 1.3.3 Power

- 115/230 VAC 50/60 Hz
- < 25 W

### 1.3.4 Physical

- Dimensions: 1.72" H x 14.5" D x 17.00" W and 1U 19" rack mount
- Weight: 7.5 lbs nominal



## 2 Option Configuration Sheet

<b>IBU-240 CONFIGURATION SHEET</b>			
<b>PART NUMBER 019000001</b>			
<b>CONNECTOR</b>	<b>FUNCTION</b>	<b>LEVEL</b>	<b>INSTALLED</b>
J1	ALARM INPUT PIN 1 STATUS A PIN 2 STATUS B PIN 3 NO CONN PIN 4 NO CONN PIN 5 NO CONN PIN 6 GROUND PIN 7 GROUND PIN 8 GROUND PIN 9 NO CONN	ACTIVE H__L ✓ ACTIVE H__L ✓	✓
J3	TIME CODE A INPUT	1.5 Vpp	✓
J2	TIME CODE B INPUT	1.5 Vpp	✓
J4 – J27	TIME CODE OUTPUT	1.5 Vpp	✓
AC POWER		115 VAC	✓

## 3 Unpacking and Installation

### 3.1 Unpacking

Carefully remove the IBU-240 from the shipping carton. The following items should be included in the shipment:

- 1 IBU-240
- 1 power cord
- 1 user guide

Note the power entry module on the rear of the IBU-240 chassis. Please take note of the voltage displayed on the rear of the power entry module and verify that the voltage matches the local line's voltage.



**CAUTION:**  
**THE IBU-240 WILL BE DAMAGED IF THE INCORRECT AC LINE SETTING IS USED.**



**WARNING:**  
**REMOVE THE POWER CORD FROM THE IBU-240 BEFORE ADJUSTING THE LINE VOLTAGE.**

If the AC line setting is incorrect, detach the power cord from the power entry module. Use a small screwdriver to lift up the fuse cover on the power entry module to remove the fuse holder. Reverse the fuse holder and re-insert the fuse holder, making sure that the correct AC line voltage is now displayed on the rear panel.



### 3.2 Installation

The IBU-240 should be bolted directly into a 19" rack mount enclosure or mounted on a shelf. The IBU-240 when fully populated has up to 27 cables attached to the rear panel, *therefore it is recommended that some appropriate cable strain-relief system be used to support these cables, particularly when the IBU-240 is not mounted on a shelf.*

### 3.3 Connections

Insert the power cord provided in the shipment into the rear of the power entry module. Connect the input reference signals to the appropriate connectors on the rear panel.



**CAUTION:**

**FOR CORRECT OPERATION, REFERENCE FREQUENCY A AND REFERENCE FREQUENCY B MUST BE THE SAME FREQUENCY, WHICH IS TYPICALLY 1 KHz.**

Connect the output cables to the desired output connectors. Any unused connectors may be left un-terminated.



### 3.3.1 Alarm Input Connection

The IBU-240 may be used with an external reference such as the Brandywine Communications GPS8 or PTS system that incorporates a discrete alarm signal. This alarm signal is used to indicate that there is a fault (e.g. GPS not tracking) on the reference signal even though the time code input signal may be present.

The factory standard IBU-240 configuration is a logic HI signal on the ALARM IN pin indicates that the input is GOOD. A built in pull-up resistor ensures that if no ALARM IN connection is made, the reference is still considered good. To change the polarity of the ALARM IN, remove the top cover of the IBU-240 and set the links to the link settings seen in the tables shown below.

LINK SETTING	REFERENCE A STATUS
LK1 2-3	HI – reference A is GOOD
LK1 1-2	LO – reference A is GOOD

LINK SETTING	REFERENCE B STATUS
LK2 2-3	HI – reference B is GOOD
LK2 1-2	LO – reference B is GOOD



## 4 Operation

For a better understanding of the IBU-240 front panel controls and indicators, refer to the diagrams located at the end of the user guide.

### 4.1 Powering the IBU-240

Once all connections to the IBU-240 have been made, apply power to the unit by moving the On/Off switch to the on position. The On/Off switch is located on the rear panel of the power entry module.

Verify that the two green LEDs for Reference A Available (1) and Reference B Available (2) are illuminated. This indicates that the IBU-240 has detected the presence of the time code input references.

Place the Reference Select switch (3) in the center (AUTO) position. The green Reference A Online LED (4) and the AUTO LED (6) should illuminate. This indicates that the IBU-240 outputs will be driven from Reference A and if Reference A fails, it will automatically switch to Reference B.

The IBU-240 is now ready for operation.

### 4.2 Selecting the Input Reference

The external reference time code used is selected by the Reference Select switch (3). Moving the switch to the left position will select input A as the reference. Moving the switch to the right position will select input B as the reference. The center (AUTO) position of the switch will use Reference A as the input only if it is present and the status indicator indicates that it is good.



### 4.3 Fault Indicator

The red LED on the front panel indicates that one or more of the outputs have a low signal. The four potential causes for a low signal are listed below:

1. The input signal level is too low therefore the output signal monitors have registered the low level as a fault.
2. Input B has been manually selected and there is no input signal connected to Reference Input B.
3. One or more output buffers have failed.
4. There is a short on an output cable.

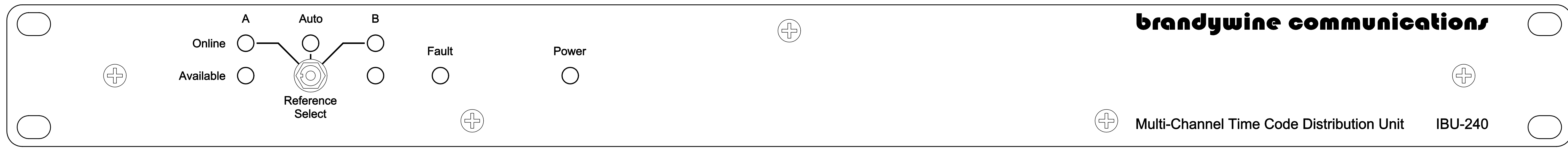
## 5 Maintenance and Troubleshooting

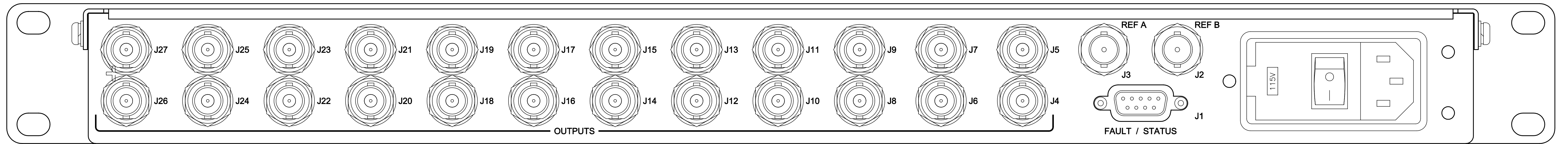
There is no preventive maintenance required for the IBU-240. Moreover, no periodic calibration is required.

<b>SYMPTOM</b>	<b>POTENTIAL CAUSE</b>	<b>CORRECTIVE ACTION</b>
No signal outputs	<ol style="list-style-type: none"> <li>1. There is no input reference.</li> <li>2. The Reference Select switch is selecting Reference B and no source is connected to the Reference B input.</li> </ol>	<ol style="list-style-type: none"> <li>1. Connect the reference input.</li> <li>2. Select an internal source.</li> </ol>
Fault light is illuminated	<ol style="list-style-type: none"> <li>1. The input signal level is too low.</li> <li>2. There is a failed output driver.</li> <li>3. There is an excessive load on one or more outputs.</li> <li>4. The output level is adjusted too low.</li> </ol>	<ol style="list-style-type: none"> <li>1. Increase the input signal level.</li> <li>2. Return unit to factory for repair.</li> <li>3. Disconnect the output loads one by one until the overloaded output is isolated. Outputs should not have loads &lt; 50 ohm.</li> <li>4. Isolate the low output level and adjust for a level &gt; 10 dBm.</li> </ol>

## 6 Diagrams

FIGURE	DESCRIPTION
1	IBU-240 Front Panel
2	IBU-240 Rear Panel
3	IBU-240 Mechanical Outline

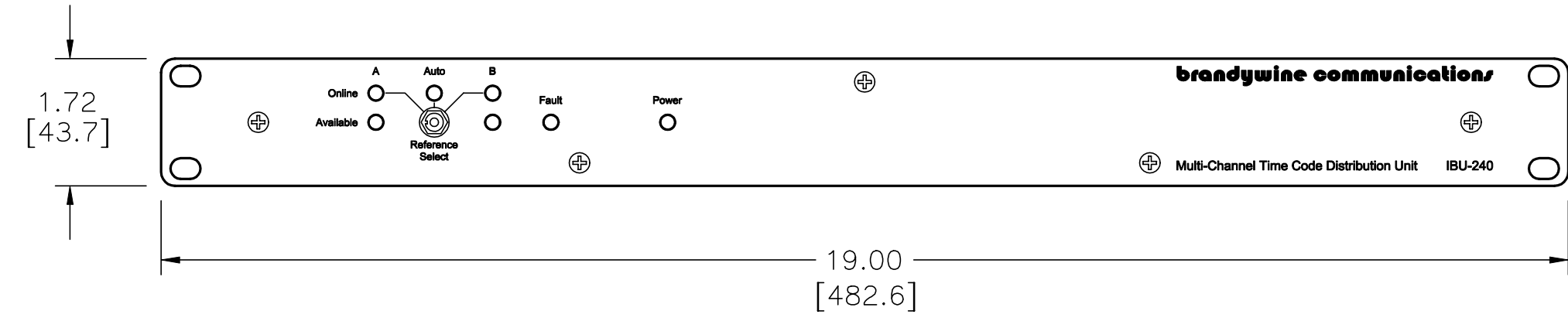
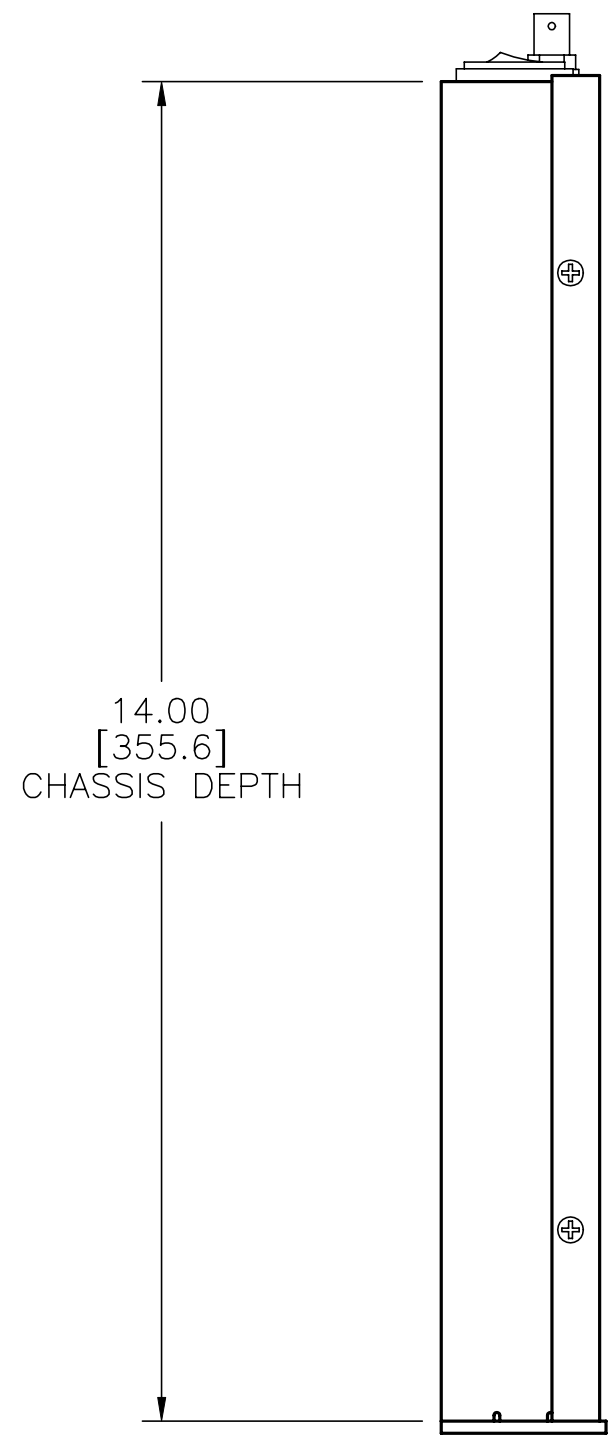
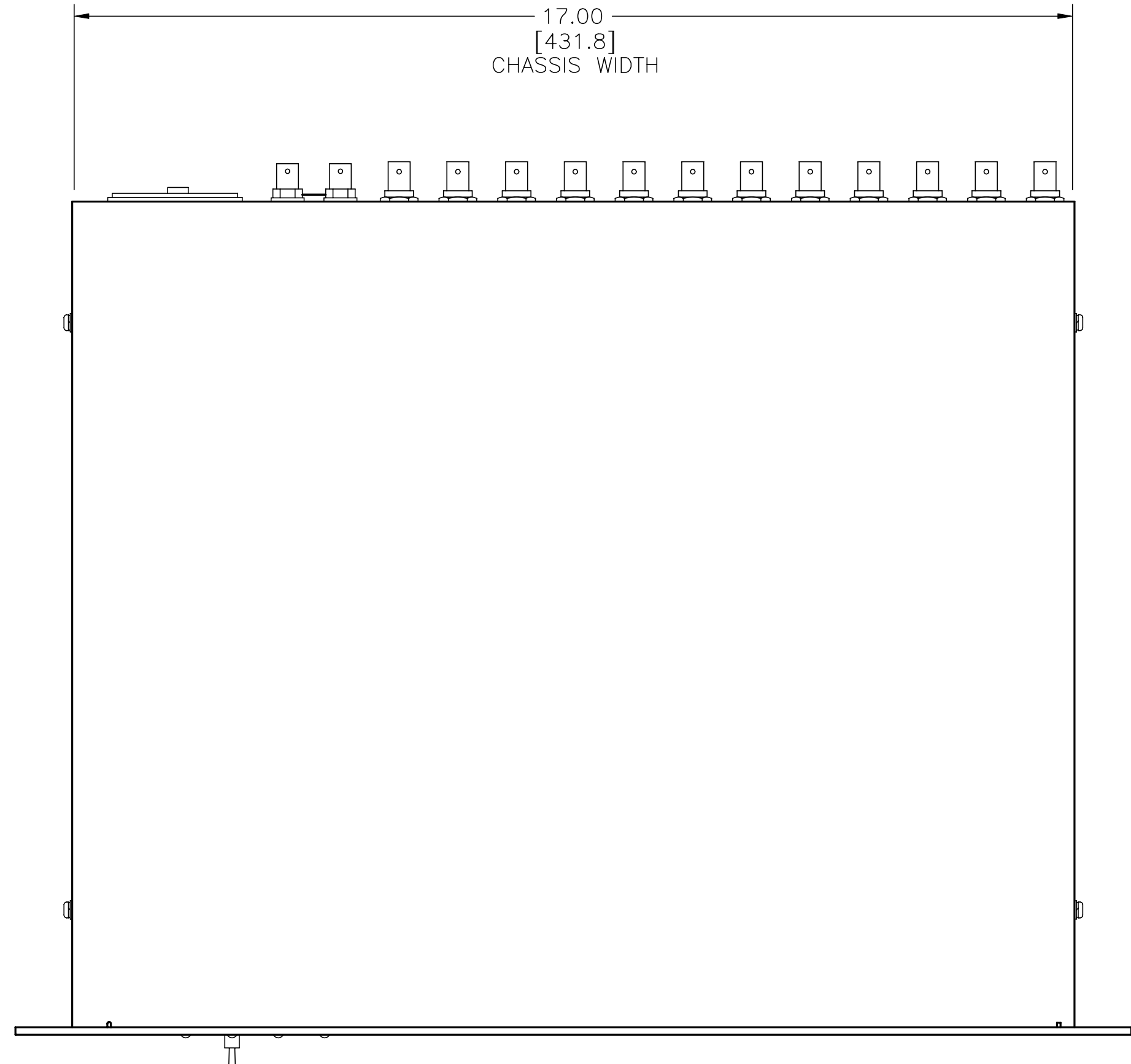
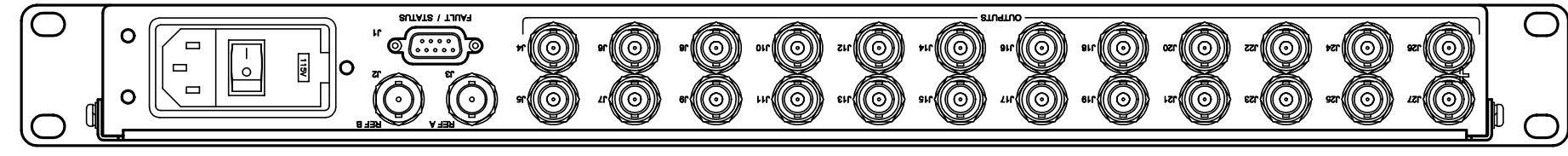






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REVISION				
REV	DESCRIPTION	DRFT	DATE	APPROVED



- 2. WEIGHT: 6.5 POUNDS [2.9 KG] NOMINAL.
- 1. DIMENSIONS ARE IN INCHES, DIMENSIONS IN BRACKETS ARE IN MILLIMETERS.

NOTE: UNLESS OTHERWISE SPECIFIED.

QTY REQD	ITEM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL	SPECIFICATION	CODE
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES			PROG/PROJ	IBU-240		
DIMENSIONS APPLY AFTER FINISH			DRAWN	Lind	8/12/04	<b>brandywine communications</b> 2230 South Fairview, Santa Ana, California 92704
TOLERANCES			ENGINEERING	GHS	AUG 04	
HOLE DIA±			.XX ±		TITLE	
ANGLES±			.XXX ±		OUTLINE DRAWING	
MATERIAL			IBU-240			
FINISH						
SURFACE ROUGHNESS			√ ---			
QTY	QTY	NEXT ASSEMBLY	USED ON			
N/A	U/O	APPLICATION				
SCALE			1/2	DO NOT SCALE DRAWING		SHEET 1 OF 1

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