

### APPLICATION

Comtech EF Data redundant LNA systems include primary and backup LNAs and an automatic switching controller. In case of primary LNA failure, fast automatic switchover to the backup LNA reduces system "down" time to a minimum.

Comtech EF Data RCLNA redundant low noise amplifier systems meet or exceed requirements for commercial geosynchronous satellites worldwide. Compact design and rugged construction make them ideal for transportable applications and severe environments. The RCLNAs have a comprehensive set of options to accommodate systems ranging from VSATs to major earth stations.

### TECHNOLOGY

The amplifiers incorporate both HEMT devices for low noise temperature performance and GaAs FET devices for low intermodulation. The units use surface mounted components for robotic manufacturing techniques, thereby insuring maximum product consistency and enhanced reliability.

### RELIABILITY

The RCLNAs utilize proprietary circuitry and high quality components to achieve an MTBF in excess of 160,000 hours. Each unit is subjected to a 72-hour burn-in and temperature cycled from -40 to +60 degrees Centigrade.

### CONSTRUCTION

Comtech EF Data provides 1+1 (one backup for one primary) and 1+2 (one backup for two primary) redundant LNA systems complete with mounting plate, brackets and indoor Redundancy Controller/Power Supply.

Each low noise amplifier is housed in a waterproof enclosure with a small profile to better accommodate redundancy configurations. The enclosure also provides a pressurizable, integral waveguide flange.

### SUBSYSTEMS

Comtech EF Data also offers transmit reject filters, cables and other integration materials as required.

### GENERAL LNA SPECIFICATIONS

Specific details are contained in standalone datasheets.

Frequency	3.4 to 4.2 GHz 3.625 to 4.2 GHz 4.5 to 4.8 GHz
Noise Temperature	30, 35, 40, 45° K
Gain	50, 60 dB
Stability	+/- 1.5 dB over Full Band 0.40 dB p/p over 40 MHz
Level at 1 dB Comp.	+10 dBm
Third Order Intercept	+20 dBm
AM-PM Conversion	0.5°/dB at -5 dBm
Linear Group Delay	0.01 ns/MHz
Parabolic Group Delay	0.001 ns/MHz <sup>2</sup>
Ripple	0.1 ns p/p
Input/Output VSWR	1.25:1 Max.
Input Waveguide	CPR229
Output Connector	Type N, Optional SMA
Operating Temp.	-40 to +60°C
Input Power	+12 to +24 VDC at 120 mA
Power Connector	Coaxial or PTA02A-9-4P



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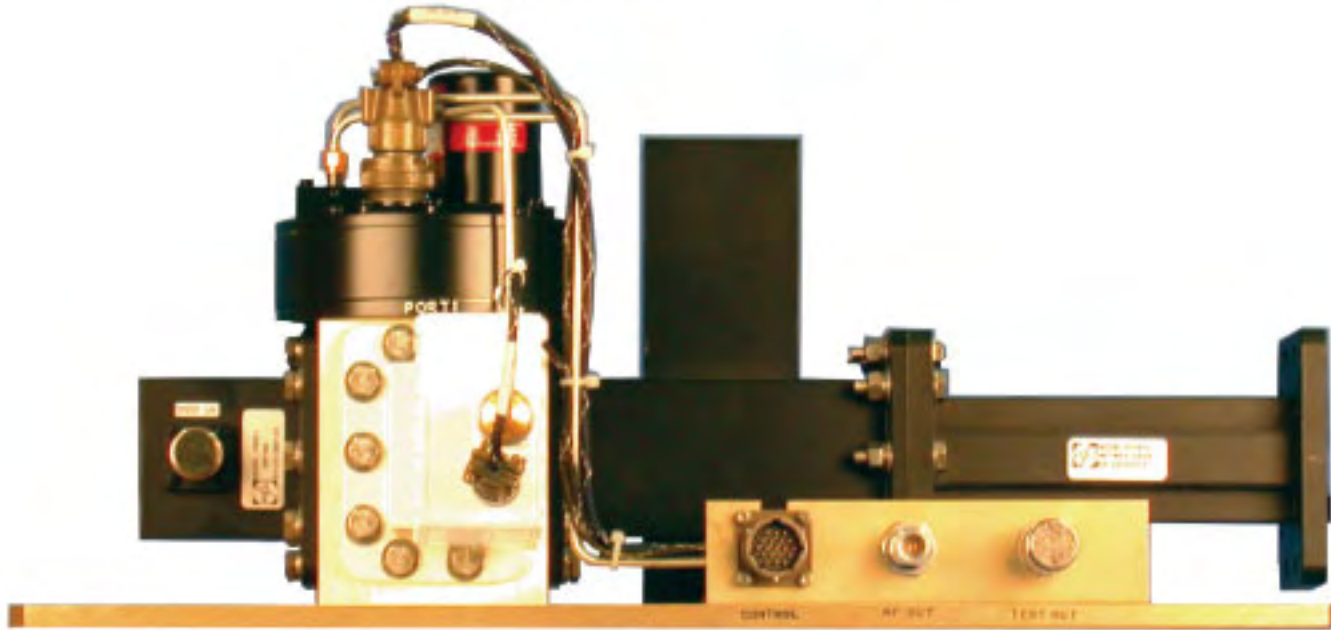
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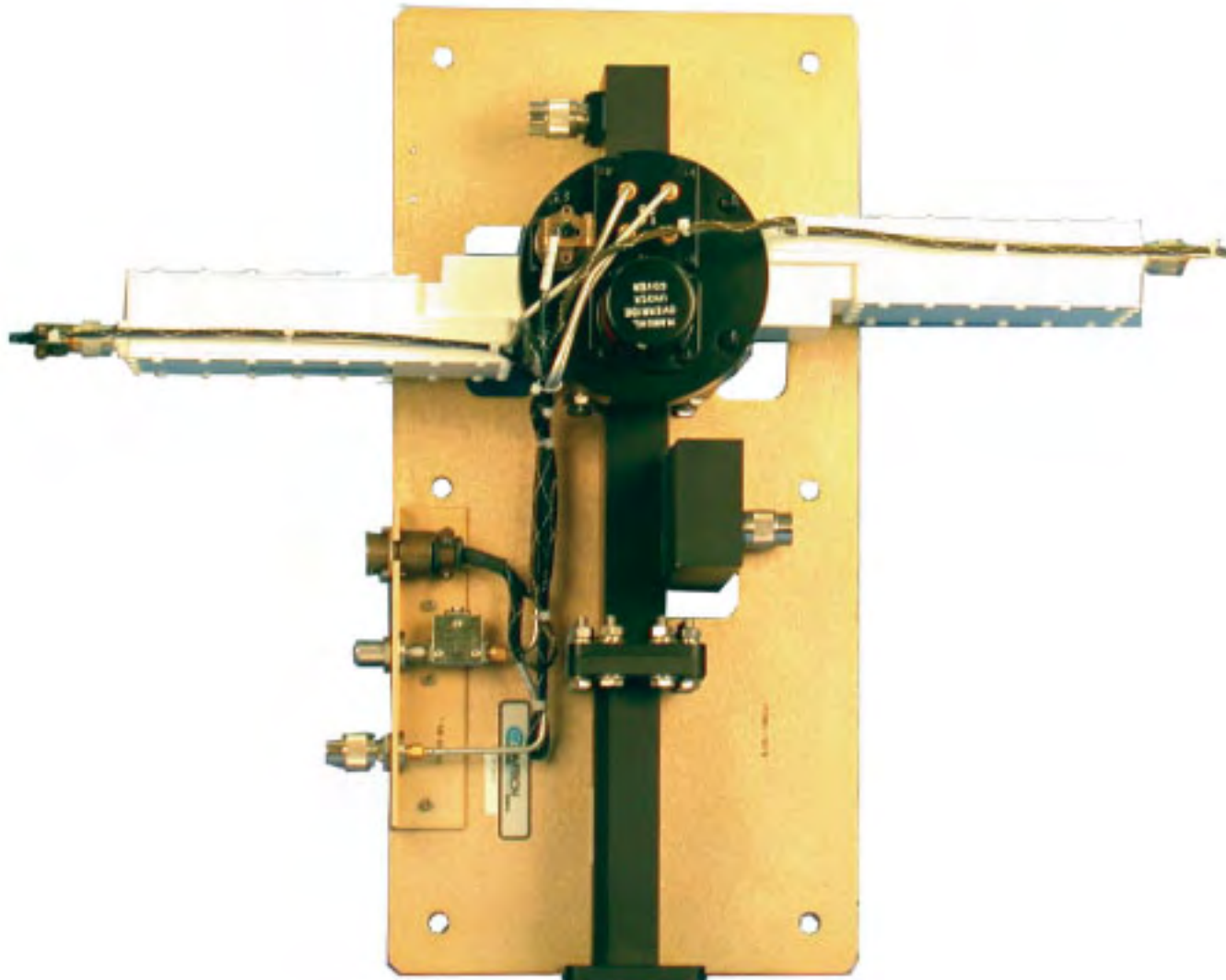
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System Views

### C-Band LNA Connectors

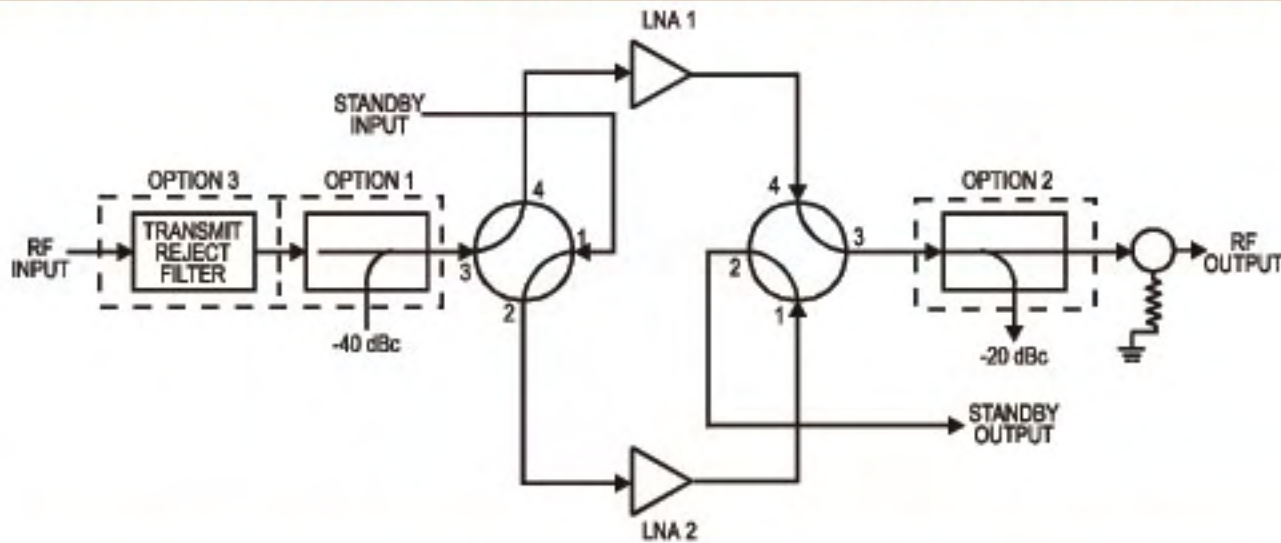


### C-Band LNA Top View

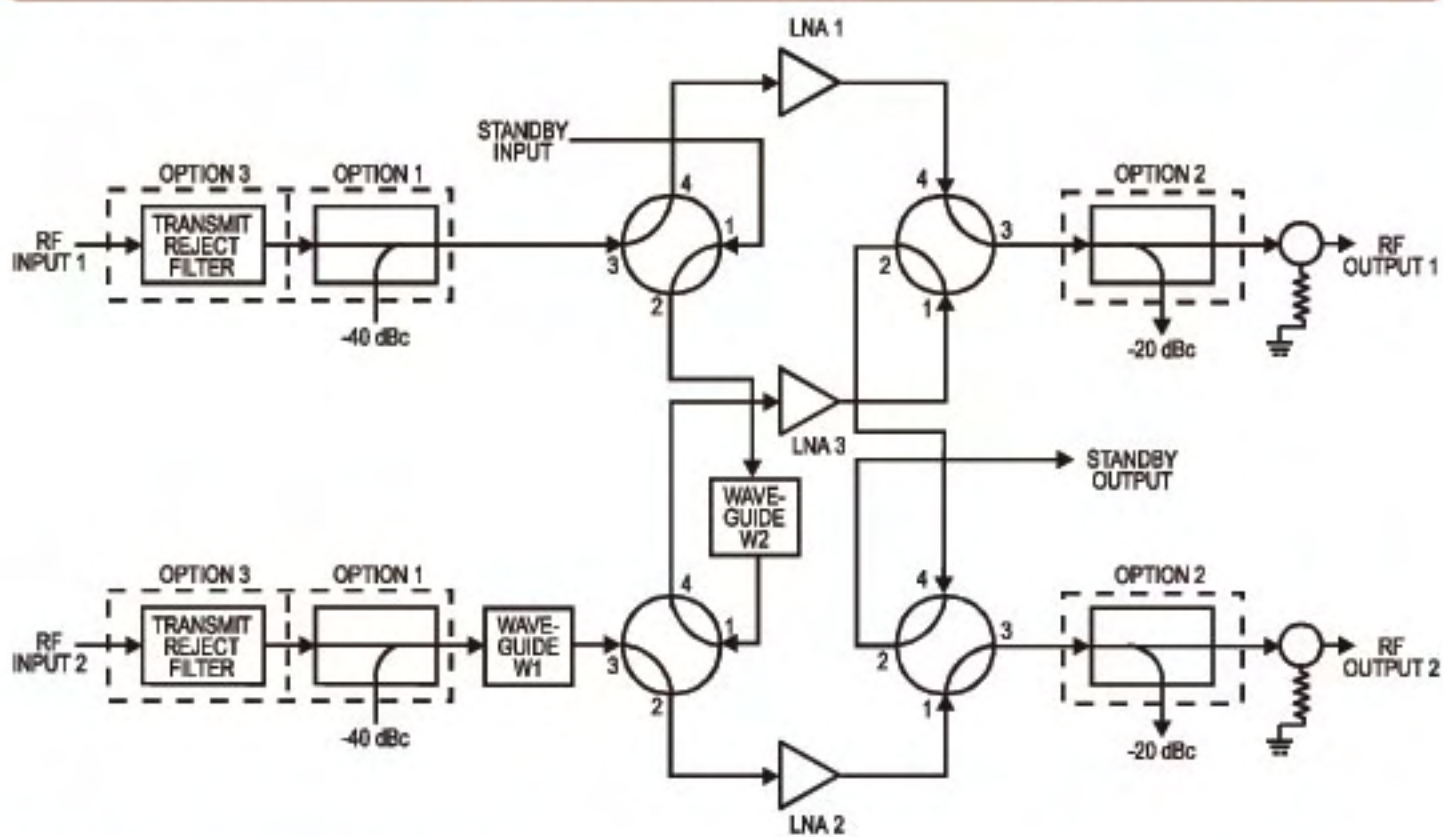


System Diagrams

## 1:1 REDUNDANT C-BAND LNA SYSTEM BLOCK DIAGRAM



## 1:2 REDUNDANT C-BAND LNA SYSTEM BLOCK DIAGRAM



**Typical system noise temperature calculation**

1:1 Redundant LNA System

$$T_{system} = T_{LNA} + T_{SWITCH} + T_{OPTION 3} + T_{OPTION 1}$$

1:2 Redundant LNA System

RF input 1:LNA on-line signal path

$$T_{system} = T_{LNA} + T_{SWITCH} + T_{OPTION 3} + T_{OPTION 1}$$

RF input 1:LNA 3 on-line signal path (LNA 1 standby)

$$T_{system} = T_{LNA} + 2 * T_{SWITCH} + T_{W2} + T_{OPTION 3} + T_{OPTION 1}$$

RF input 2:LNA 2 on-line signal path

$$T_{system} = T_{LNA} = T_{W1} + T_{SWITCH} + T_{OPTION 3} + T_{OPTION 1}$$

RF input 1:LNA 3 on-line signal path (LNA 2 standby)

$$T_{system} = T_{LNA} + 2 * T_{SWITCH} + T_{W1} + T_{W2} + T_{OPTION 3} + T_{OPTION 1}$$

**Typical Noise Temperature in Kelvin at 23° C**

Band (GHz)	3.62 - 4.205	3.4 - 4.2
	WR-229	WR-229
$T_{SWITCH}$	1.5 <sup>0</sup>	1.5 <sup>0</sup>
$T_{W1}$	1.5 <sup>0</sup>	1.5 <sup>0</sup>
$T_{W2}$	1.5 <sup>0</sup>	1.5 <sup>0</sup>
$T_{OPTION 1}$	0.5 <sup>0</sup>	.5 <sup>0</sup>
$T_{OPTION 3}$	2.4 <sup>0</sup>	7 <sup>0</sup>



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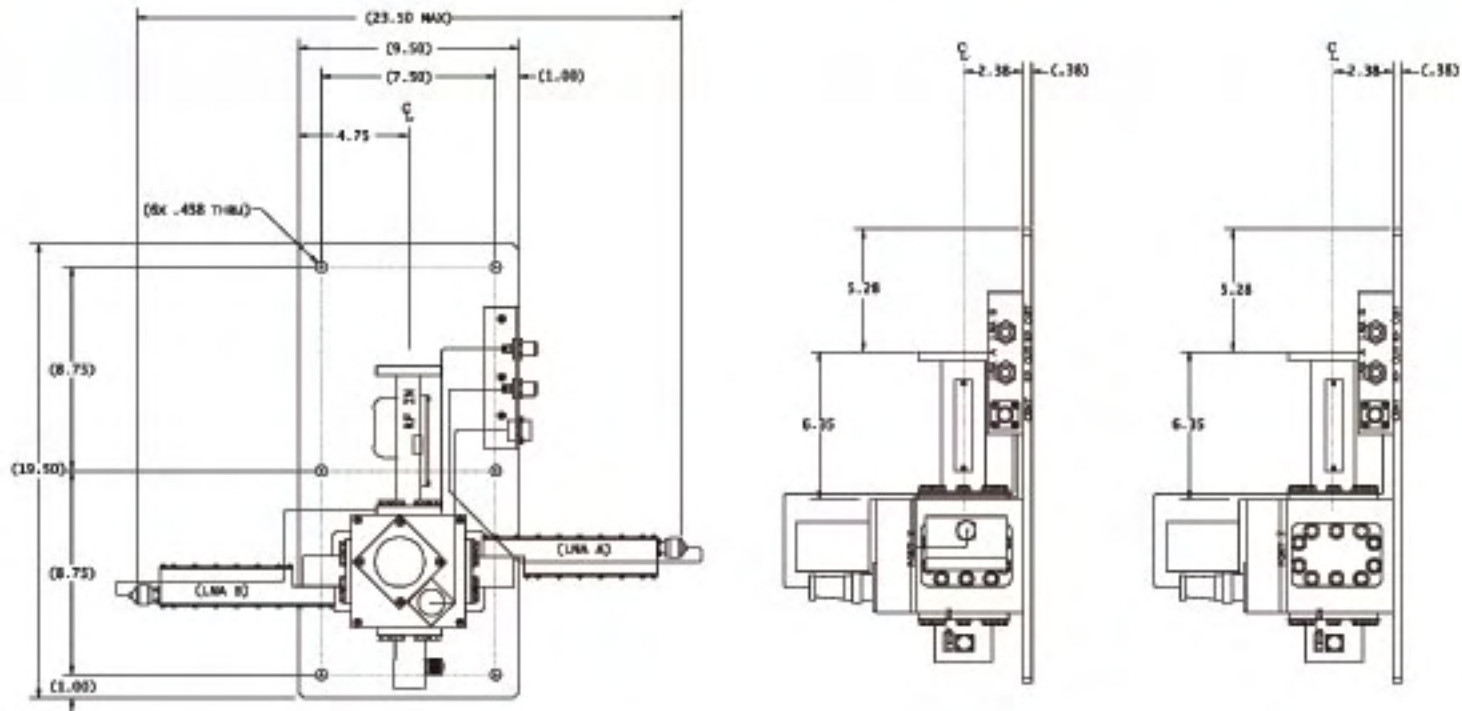
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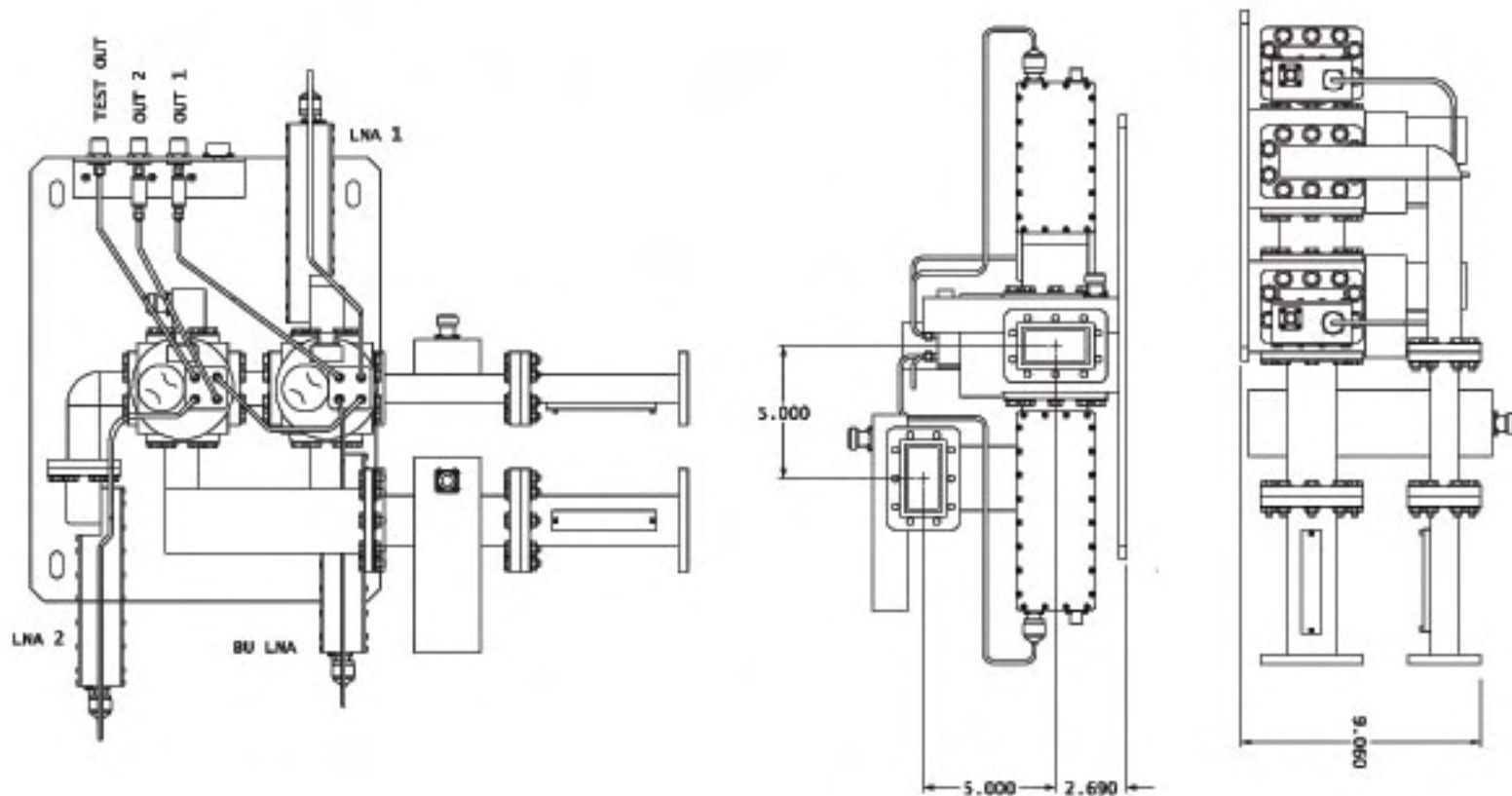
## Amplifier Assembly Drawings

NOTE: These drawings are of typical assemblies. Some options are shown. Please contact Comtech EF Data sales for detailed information.

### 1:1 C-Band Amplifier Assembly Outline Drawing



### 1:2 C-Band Amplifier Assembly Outline Drawing



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