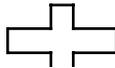# INSTRUCTION MANUAL

MODEL 2086 Upconverter

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MODEL 2086 UPCONVERTER

1.0 General

1.1 Equipment Description

The 2086-XXX Upconverter converts a 70 MHz IF signal to a fixed frequency (X.XX GHz) in the 0.95 to 1.75 GHz band with no spectrum inversion, low group delay, and flat frequency response. The 70 MHz IF input is mixed with a fixed frequency local oscillator (LO) signal to X.XX GHz. The frequency is fixed and specified by the customer. A green front panel LED lights when DC power is applied and a red LED lights if the phase lock loop for the LO is in alarm. Connectors are BNC female for the IF input and Type F female for the RF output. Power is provided by a 120 ± 10% VAC, 60Hz, wall mount power supply. The 2086 Upconverter is housed in a 4.7" wide X 1.75" high X 12.5" deep aluminum chassis. The 2086 can be mounted on an 1 3/4" X 19 " rack mount panel (**option -R**). The 2086 can also be powered by the 2000-01 switching power supply using **option -C** which includes no power supply.
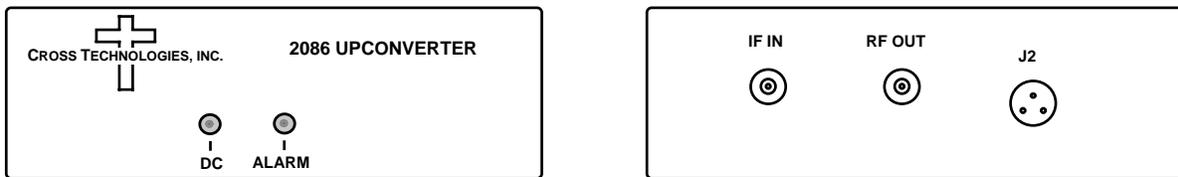

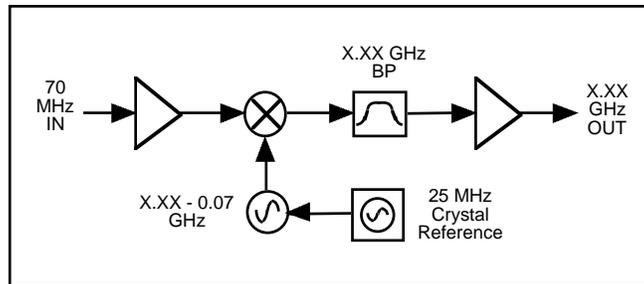**FIGURE 1.1 2086 Upconverter Front and Rear Panels**

FIGURE 1.2 2086 Upconverter Block Diagram

1.2 Technical Characteristics

EQUIPMENT SPECIFICATIONS*

Input Characteristics

Input Impedance/RL	75 Ω /18 dB
Frequency	70 ± 15 MHz
Input Level range	-10 to -20 dBm
Input 1 dB compression	0 dBm

Output Characteristics

Impedance/RL	75Ω/12 dB
Frequency	Fixed frequency in the 0.95-1.75 GHz band

Channel Characteristics

Gain	0 ± 1.0 dB
Spurious Response	<-50 dBC
Frequency Response	± 0.5 dB, ± 15 MHz
Group Delay, max	0.01 ns/MHz^2 parabolic; 0.03 ns/MHz linear; 1 ns ripple
Frequency Sense	Non-inverting

Synthesizer Characteristics

Frequency Accuracy	± 25 kHz max over temp
Phase Noise (dBC/Hz)	≤ -70 @ 1 kHz; ≤ -80 @ 10 kHz; ≤ -95 @ 100 kHz; ≤ -110 @ 1 MHz
LO Frequency	X.XX - 0.07 GHz

Indicators

DC Power	Green LED
PLL Alarm	Red LED

Other

RF Connector	Type F (female)
IF Connector	BNC (female)
Size, Bench Top	4.7" wide X 1.75" high X 12.5" deep
Size, Rack Mount (-R)	19 inch standard chassis 1.75"high X 13.0" deep (Optional)
Power	120 ± 10% VAC, 60Hz, 20 watts max, wall mount power supply

Options

-R	Rack mount
-C	No power supply (use with Model 2000-01 Power Supply)
Call for frequencies	

*+10˚C to +40˚C; Specifications subject to change without notice

2.0 Installation

2.1 Mechanical

The 2086 is packaged in an aluminum extrusion. The **-R option** is mounted on a 1 3/4" X 19" panel that can be mounted to a rack using the 4 holes at the ends. The 2086 derives ± 15 VDC from the wall power supply. See Figure 2.3.

2.1.1 Cleaning Instructions

Wipe the exterior with a dry, soft cloth. Use no detergent or cleaning chemicals.

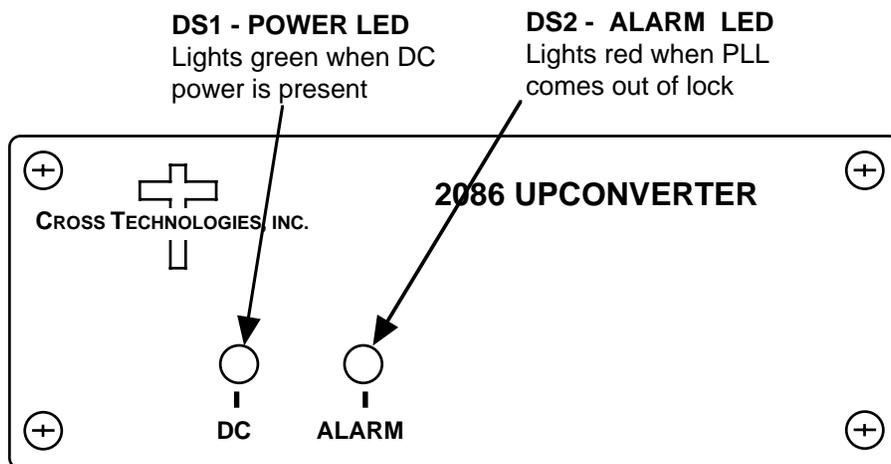### 2.2 Indicators - Figure 2.1 shows front panel controls and indicators.

DS1 - POWER LED
Lights green when DC
power is present

DS2 - ALARM LED
Lights red when PLL
comes out of lock

2086 UPCONVERTER

CROSS TECHNOLOGIES, INC.

DC   ALARM

FIGURE 2.1 2086 Front Panel Indicators

2.3 Input / Output Signals - Figure 2.2 shows the input and output signals to the 2086.

J1 - IF INPUT
70 MHz input
-20 to -10 dBm
75Ω, BNC, female conn.

J3 - RF OUTPUT
 X.XX GHz output
-20 to -10 dBm (0 dB gain)
75Ω, Type F, female conn.

J2 - DC IN
Regulated ±15
VDC from the wall
power supply

GND
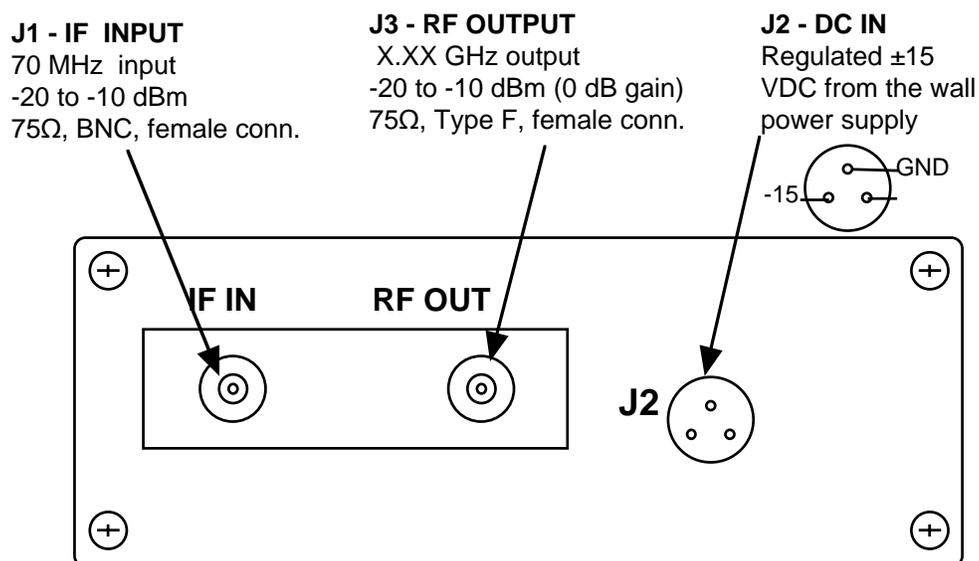-15

IF IN   RF OUT   J2

FIGURE 2.2 2086 Rear Panel Inputs and Outputs

2.4 Accessing the PC Card

There are NO USER JUMPERS or other on-card controls. ALTHOUGH IT IS NOT RECOMMENDED AND MAY VOID THE WARRANTY the following shows how to remove the printed circuit board (PCB) from the extrusion:

     1.) **Always remove power** when installing or removing the PCB from the extrusion

     2.) Remove four (4) **rear panel screws** (see Figure 2.3).

     3.) **Gently** pull the rear panel and PCB assembly completely out of the extrusion.

     4.) To install the PCB **gently** push the rear panel and PCB assembly completely into the extrusion Make sure the shield goes in the lower channel and the PCB in the next channel above that in the extrusion and that the front panel controls go through the front panel holes.
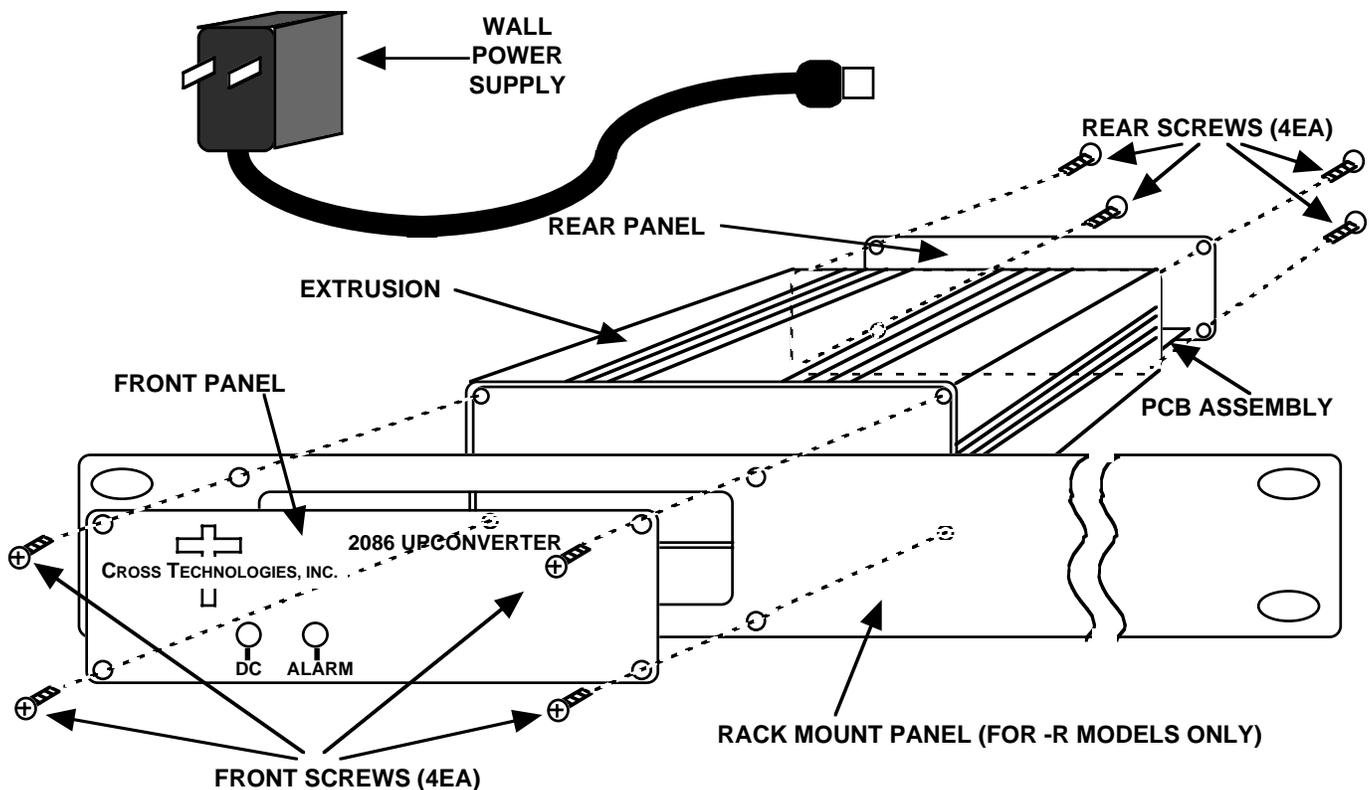
     5.) Install four (4) **rear panel screws**.

FIGURE 2.3 2086 Assembly

2.5   Installation / Operation

2.5.1   Installing and Operating The 2086

    1.) Connect the wall power supply to J2 and the wall power supply to 115 VAC, 60 Hz (Figure 2.2)

    2.) Be sure DS1 (green, DC Power) is on and DS2 (red, PLL Alarm) is off (Figure 2.1).

    3.) Connect a -10dBm, maximum, signal to IF In, J1 (Figure 2.2)

    4.) Connect the RF OUT, J3, to the desired device.