

## Model 6109 6 MHz Off-Air Reference



### Introduction

The Model 6109 6 MHz Off-Air Reference provides a convenient method to phase lock Scientific-Atlanta video modulators and upconverters to an off-air VHF broadcast source. It offers an attractive and cost-efficient method for reducing co-channel interference in CATV systems. This interference is often caused by ingress of high power VHF signals into the distribution plant or subscriber premises equipment.

### Description

The Model 6109 Off-Air Reference provides a nominal 6 MHz reference signal output from the VHF broadcast video carrier and a sample of the modulator/upconverter program IF. This 6 MHz signal is then used as a reference input to a video modulator to maintain its RF output in phase with the off-air VHF video carrier. Phase locking a CATV modulator to an off-air source can reduce and stabilize visible beats in the video signal of a program source that is subject to ingress interference.

### Features

Features	Benefits
Built-in VHF tuner	Supports all VHF channels
Automatic bypass mode	Modulator remains functional if broadcast input signal is lost
Precision 6 MHz output	Modulator maintains low noise specifications
Flexible operation	Manual or Remote control modes
Composite IF input	Supports IF transport in source /hub networks
1 RU package	Minimizes rack space

## Definitions

**NTSC VHF Off-Air** - Any NTSC broadcast station with a channel assignment from Channel 2-13.

**Broadcast Frequency Offsets** - Frequency offsets of +10 kHz or -10 kHz may be assigned by the FCC to certain broadcasters in overlapping coverage regions to minimize the potential for co-channel interference.

**Co-Channel Interference** - Interference seen as beats, bars, and other visible distortions caused by two NTSC signals being received on the same channel.

**Program IF** - The IF signal that is being used with the modulator/upconverter to provide the actual RF output. This signal may differ from the main composite IF signal due to EAS switching or other alternate programming that could be temporarily switched into the RF output converter.

**Phase Lock** - Servo loop circuitry that forces two signals to maintain a stable phase relationship.

**Ingress** - The leakage of externally radiated signals into the CATV distribution system.

## Technical Details

The Model 6109 Off-Air Reference provides a nominal 6.000 MHz, 1 volt peak-to-peak sine wave output that is used to phase lock the modulator/upconverter RF output with the received NTSC video carrier.

The Model 6109 Off-Air Reference provides an automatic switching function between the 6.000 MHz reference used by the modulator internally, and the 6.00 MHz controlled phase signal generated by the Model 6109 Off-Air Reference. This function is useful in the event of input RF carrier loss. If the off-air phase lock source should cease transmitting, the modulator will then switch over to its internal reference signal and operate normally.

A Model 6109 6 MHz Off-Air Reference is required for each VHF off-air channel (2-13) to be locked. The modulator must accept a nominal 6 MHz reference input as its phase locking source. The Scientific-Atlanta Continuum® Models 9820/9821 Modulators, Models 9860/9861 Upconverters, and the Series VM2500 Modulators satisfy this requirement.

Broadcast offsets ( $\pm 10$  kHz) are handled by the 6 MHz Off-Air Reference.

The Model 6109 6 MHz Off-Air Reference does not include a demodulator section. If the program content on the phase locked channel must be derived from an off-air source, an appropriate demodulator is required to provide video and audio to the modulator or Composite IF to the upconverter.

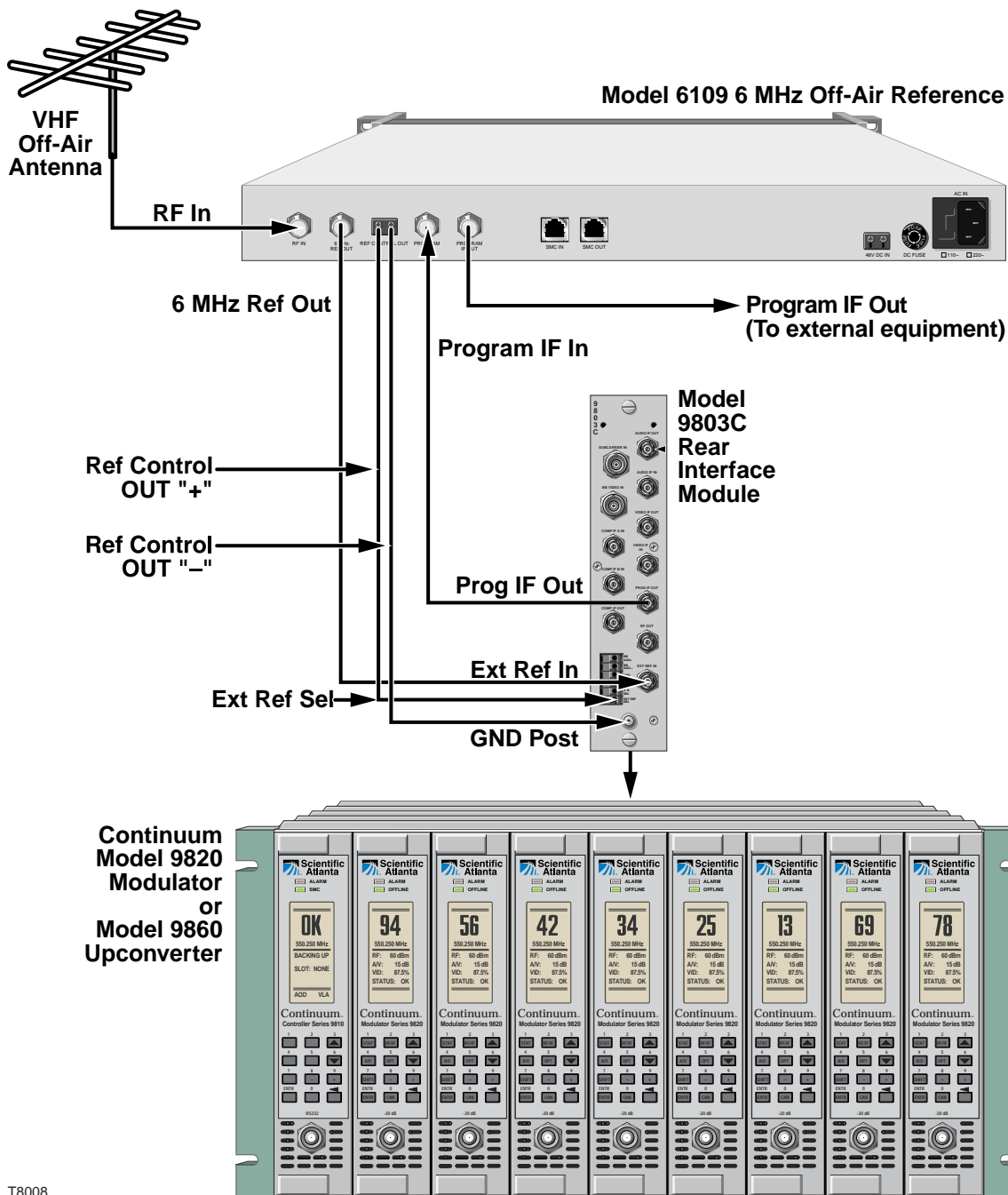
### On-Channel Carriage

If the off-air broadcast signal is carried on the same cable channel for convenience or franchise requirements, then interference reduction should be good.

### Alternate Channel Carriage

If different content than the broadcaster is carried on the same cable channel, then interference reduction is less than for on-channel carriage, but better than a non-phase locked signal.

## Connection Recommendations



T8008

Typical Model 6109 Interface Application

## Ordering Information

Description	Part Number
Model 6109 6 MHz Off-Air Reference	593564
Model 9803C Rear Interface Module Note: Required accessory for Continuum® products only. Not required when used with Series VM2500 Modulators.	546062

## Specifications

RF / IF	Value
RF Input Frequency Range	Channels 2-13
RF Input Level	-15 dBmV to +15 dBmV (maximum level > +40 dBmV)
RF Frequency Accuracy	±1 kHz from nominal carrier frequency per FCC requirement 73.1545. Note: The nominal frequency may be offset by +10 kHz or -10 kHz per FCC requirement 73.606.
RF Input Impedance	75 ohms, nominal
RF Input Return Loss	>12 dB across tuned channel
IF Video Carrier Frequency	45.75 MHz ±2.5 kHz
Program IF Input Level	+31 dBmV to +45 dBmV
Program IF Input Impedance	75 ohms, nominal
Program IF Input Return Loss	>17 dB from 41 MHz to 47 MHz
6 MHz Reference Output	Value
Output Frequency	6.00 MHz ±380 Hz (sine wave)
Output Level	0.6 to 1.3 V p-p
General	Value
Input Powering	90 V AC to 130 V AC, 60 Hz, or 40 to 80 V DC, 25 W max.
Chassis	1.75 inch rack mount (per EIA Standard RS-310-C)
Ambient Operating Temperature	0°C to +50°C
Relative Humidity	5% to 95%, non-condensing
Remote Control	Scientific-Atlanta SMC II Interface

## Rear Panel View



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