Products Optimized for 2 GHz

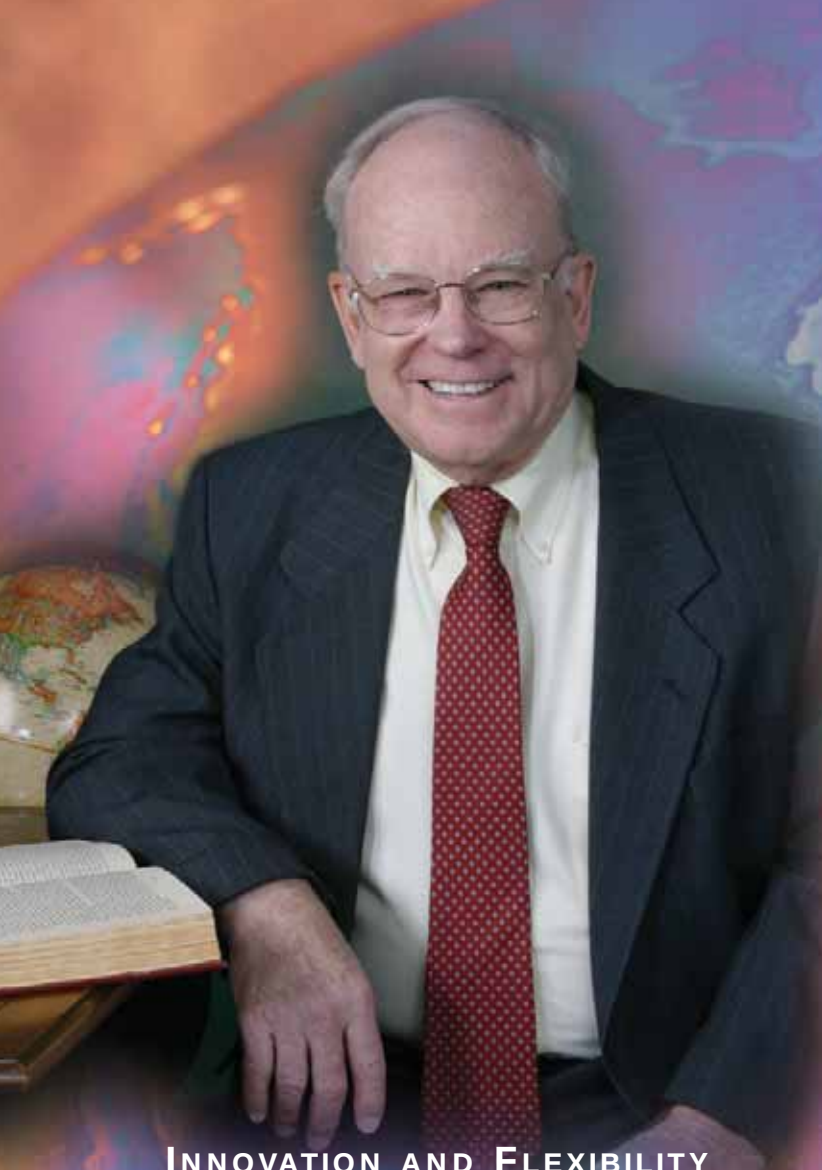
Nucomm
Product Guide

Nucomm

Microwave Solutions

Innovation Inside

Nucomm



Innovation and Flexibility

Nucomm Inc. is a worldwide provider of digital and analog microwave systems for the television broadcast industry.

Nucomm is proud of it's history of offering products that are on the leading edge of technology both in features and performance. In keeping with that tradition, Nucomm has worked tirelessly to develop a broad line of products for today's digital environment with an eye on future technology. By focusing on innovation, product quality and customer satisfaction, Nucomm has gained a reputation as a provider of reliable, leading edge microwave systems that have broad appeal for broadcast, government, law enforcement and homeland security applications.

Our Mission

Our primary responsibility is to provide quality products that offer the latest technology and that will serve our customers for years to come. In the words of Dr. John B. Payne, the founder and president of Nucomm, "The key to our success is in maintaining a firm commitment to our customers, the industry and the technology."

A History of Accomplishments

- Developed the first truly integrated transmitters with multiple modulation formats, e.g. ChannelMaster TX and Newscaster VT2
- Developed a high performance central receiver with Ethernet interface, multiple modulation formats and optional spectrum viewer
- First to use VSB modulation in a digital microwave link
- Developed digital transmission techniques for use over conventional analog links, e.g. the Analog Coder
- First to demonstrate the advantages of digital transmission for electronic newsgathering
- Pioneered advanced features in early analog portable microwave transmitters and receivers, including the use of surface mount technology, built-in color bar/test pattern/ID generator, field adjustable audio subcarriers, multi-band operation in a compact package, clam shell design, universal AC/DC power supply and a two piece van transmitter design

Take a Closer Look at Nucomm

Whether you need a wireless camera transmitter, ENG transmit/receive system, portable transmit/receive or a fixed link system, Nucomm wants to be your primary supplier of microwave equipment.

After reviewing the summary descriptions in this product guide, please call or email us for additional information. And when you can, please visit our modern design and manufacturing facility in Hackettstown, New Jersey, just 60 miles west of New York City, near Interstate 80.

When planning your next system please look closely at Nucomm, and see what we mean when we say *"Innovation Inside"*.

Technical Services

The road to customer satisfaction begins with the ability to provide complete and responsive system solutions. Whether your needs include a new fixed link path, a turn-key ENG receive project or a system upgrade, Nucomm is ready to assist you with a comprehensive array of system engineering, manufacturing and integration services.

Examples of Nucomm's best-in-class solutions include:

> ENG/OB Systems — Nucomm is highly experienced with digital ENG transmission systems, their design and operating characteristics. We have conducted innumerable field tests and have installed many systems at 2, 7 and 13GHz.

> Our broad experience allows us to offer truly integrated portable and ENG Van transmit systems, wireless camera transmit systems and a broad range of ENG receive antenna systems, including omni directional, sectorized and steerable systems in all sizes. Both low cost and advanced capability remote control systems are also available. In addition to system design and installation, Nucomm offers extensive commissioning services

> STL/TSL/Intercity Relay Links — Nucomm can provide a wide variety of digital and analog systems in many configurations, including hot standby, dual-channel and multiple hop systems. Digital systems can accommodate multiple input signals, system mux, high data capacity, selectable modulation formats and multiple I/O interfaces. Nucomm offers installation and system commissioning services for our fixed link systems

Technical people are available anytime for telephone consultation and assistance.

To compliment our comprehensive line of digital products, Nucomm offers an equally broad range of technical services, including:

> Complete path and system design

> Comprehensive system quotations

> Path calculations

> Total system Integration

> Turn-key installation

> System commissioning, check out and proof of performance

> Training classes, at Nucomm or at the customer's location

> All systems are thoroughly burned-in, undergoing temperature cycling and rigorous end to end testing prior to shipment.

Customer Service

In addition to high performance microwave products, Nucomm prides itself in offering customer service and support that is second to none in the industry. After the sale you can rely on 24/7 support. A fully equipped and staffed service department provides prompt attention and turn around of equipment in need of repair or upgrading. Nucomm maintains a considerable inventory of loaner equipment to support its customers.

Visit our website for more information or contact our customer service department.

Sales: 1.800.968.2666 (Toll Free, US & Canada)
& service: 1.908.852.3700

sales@nucomm.com
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NULINX

Digital/Analog (Digalog) Microwave Link

NuLinx TX and RX

Nucomm is pleased to introduce the NuLinx series of fixed link radios. The NuLinx brings new meaning to the word flexibility, offering features such as comprehensive front panel control of parameters, frequency agility, remote control and monitoring capability over either RS232 or Ethernet interfaces.

Designed with state of the art high performance RF components including YIG oscillators and linearized power amplifiers, the NuLinx TX and RX pair are ideal for virtually any digital or analog transport requirement. The basic unit accepts 70 MHz input (TX) from either a digital or analog modulator. Modulation formats such as FM,VSB QPSK or 16 to 128QAM are typically used. Nucomm manufactures a full line of companion modulator/demodulator products.

The NuLinx is available in bands from 1.3 to 15.4 Ghz.

NuLinx Transmitter and 8VSB Modem (For self-contained system, see the V-Stream 2 on page 3)

FEATURES:

- Digital performance to 120 Mbs (25 MHz BW)
- Supports FM, VSB, QPSK, COFDM, ATSC and 16 to 128QAM
- Ultra low noise YIG oscillator
- Linearized RF power amplifiers
- Low noise, high dynamic LNA with AGC
- RS232 and Ethernet interfaces
- Simplex, duplex and hot standby

OPTIONS:

- Space diversity with error free seamless switching
- Systems design, integration and commissioning

High Power Amplifier (see page 3)

NuLinx and MM200 Multi-Rate Modem (see the Multi-Rate Modem on page 5)

DUAL STREAM

Dual Carrier STL System

Nucomm's Dual Stream dual carrier STL system is ideal when a second RF STL channel is not available. The Dual Stream transports the ATSC 19.39Mbs data stream, analog NTSC signal and T1 Data Pack within a 25 MHz RF channel.

The Dual Stream STL system eliminates the need for digitizing and encoding the NTSC signal using expensive encoders. Since the NTSC signal is not encoded to a digital signal, it does not have latency. In addition, all VIT's line and control subcarriers are not altered or affected.

The Dual Stream system consists of two separate radios constructed in separate cases for easy redeployment when NTSC transmission is no longer required. The high performance NuLinx series transmitter and receiver carry the analog video and audio. The ATSC digital signal is transported using Nucomm's innovative 8VSB digital microwave transmitter and receiver. The RF output of each transmitter is combined to feed a single antenna.

The Dual Stream system is designed for easy integration and service with a split chassis design of the analog section that provides easy access to all internal modules. The Dual Stream can be configured for simplex or duplex operation. Several protection configurations are available such as hot standby, space diversity and error free seamless switching.

FEATURES:

- **NTSC and the 19.39 Mbps ATSC data stream, both transported within a 25 MHz RF channel**
- **8VSB modulation for spectral efficiency and improved robustness over 16QAM**
- **De-jittered receiver output: SMPTE-310M and DVB-ASI**
- **Up to six audio subcarriers**
- **T1 Data Pack includes: T1, two RS-232, eight logic inputs, four logic and four form C relay outputs**
- **Ch 3 or 4, 8VSB output enables HD video/audio to be monitored on a set-top box**
- **Multiple interfaces: both SMPTE-310M and DVB-ASI**
- **RS232 and internet control and monitoring interfaces**
- **Linearized power amplifiers**
- **Open architecture platform for easy reconfiguration to other HDTV STL systems**
- **Configurable for simplex, duplex, hot standby and space diversity with error-free seamless switching**

OPTIONS:

- **HD video monitor (set-top box)**
- **Upgradable to dual digital or DS3 system**

SEAMLESS SWITCHING

Error-free Seamless Switching

As an option, Nucomm offers seamless error-free switching on all hot standby and diversity receive systems. In conventional hot standby receive systems, switching the output from one receiver to the other can cause an interruption of the signal for a few milliseconds. In a digital STL system, any interruption in data flow, for even a microsecond, means the loss of considerable data. In a digital video system, such as high definition, the loss of data for even a microsecond will cause the demodulator to lose lock for up to several seconds causing the picture to freeze or tile.

In Nucomm's hot standby and diversity receive systems, error-free seamless switch monitors each digital receive signal path for errors. Errors can occur due to signal fades, multi-path effects, interference or equipment malfunctions. If an error is detected from one receiver the system automatically switches and receives data from the other receiver. The system switches instantaneously so as not to lose any data. Data from each hot standby receiver modem must first be adjusted so that all bits are aligned and synchronized. The data packet from each path is monitored to detect the occurrence of an error. The output switch then selects the error-free packet path. Switching from one data path to the other occurs within a single data bit. Switching is performed before de-multiplexing. This provides for error-free switching of the wayside channel as well as the high data rate signal.

V-STREAM 2

Low Cost ATSC STL System with Variable Data Rates from 1 to 30 Mbps

The V-Stream 2, an ATSC digital microwave STL system using advanced 8VSB modulation and fifth generation decoding, now accepts any input data rate from 1 to 30 Mbps. It is a lower-cost STL alternative for the television broadcaster, available in bands from 1.3 to 15.4 GHz. The V-Stream 2 system transports the ATSC 19.39 Mbps data stream plus a T1 Data Pack within a 7.5 MHz bandwidth; in addition the input data rate is automatically variable from 1 to 30 Mbps. The transmitter auto selects between SMPTE-310M and DVB-ASI inputs, while the receiver is configured with two SMPTE-310M and one DVB-ASI outputs. The receiver also offers a channel 3 or 4, 8VSB RF output that enables one to display the actual HD picture being received over the microwave link. A T1 Data Pack is standard and includes a T1, two RS-232, eight logic inputs, four logic and four form C relay outputs. The V-Stream 2 also offers an optional integrated input multiplexer/demultiplexer.

FEATURES:

- Data rates variable from 1 to 30 Mbps
- The 8VSB advantages (using fifth generation technology):
  - Optimized forward error correction
  - Advanced adaptive equalization
  - Performs well over long paths
  - Has monitoring capability—DTV and bit error rate
  - 7.5 MHz spectral efficiency
  - Improved fade margins
- Multiple interfaces: both SMPTE-310M and DVB-ASI
- De-jittered receiver output: SMPTE-310M and DVB-ASI
- T1 Data Pack includes: T1, two x RS-232, eight logic inputs, four logic and four form C relay outputs
- Performance monitoring via RS-232

OPTIONS:

- Integrated multiple input multiplexer/demultiplexer
- DC or universal power supplies
- Error-free seamless diversity receive switch
- HD video monitor (set-top box)

HIGH POWER AMPLIFIER

Analog or Digital to 15 GHz, 5 to 20 Watts

Nucomm's High Power Amplifiers are designed specifically for both digital and analog applications where additional output power is required. The HPA is available in bands from 1.3 to 15.4 GHz with typical gains of 5 to 10 dB. Output power for analog applications is from 10 to 20 watts depending on the frequency. For digital applications the power is reduced by 3 to 10 dB, depending on modulation format.

FEATURES:

- Increase link fade margins over long paths
- Easy integration into existing waveguide systems
- Front panel meter monitors output power
- 19" rack mounting

OPTIONS:

- Higher gains
- Dual hot standby operation
- Universal AC/DC power supply optional

FIXED LINK ANTENNAS AND ACCESSORIES

Nucomm offers a complete range of antenna, coaxial cable, waveguide and hardware products for fixed tower mounting applications. Please contact Nucomm for a detailed quotation specific to your application.

ACCESSORIES:

- High gain directional antennas
- Waveguide and accessories
- Other specialty antennas available upon request

FMT4/FMR4

Analog 70 MHz FM Modulator/Demodulator

Nucomm's series FMT4/FMR4 is a family of self-contained rack-mounted baseband or 70 MHz modulators and demodulators that provide the baseband interface for audio and video to and from baseband or 70 MHz. Up to three complete FM modulators or demodulators can be integrated into a two vertical rack space drawer (3.5", 8.89 cm). An EIA/CCIR video emphasis/de-emphasis network is included in each unit. This network can be bypassed to provide a flat video response if desired. Any power requirement can be met including a universal AC/DC power supply. Up to six field programmable synthesized FM audio subcarriers can be integrated into each FM modulator and demodulator. Each audio subcarrier frequency is independently field tuneable by internal dip switches to any frequency in 5 kHz steps.

FEATURES:

- 1 to 3 FM modulators or demodulators per drawer
- Complete system diagnostics
- Up to six synthesized FM audio subcarriers, field programmable
- EIA/CCIR Video with low-pass filter
- Clamped output standard on demodulator

OPTIONS:

- Video presence detector
- Built-in test generator with color bar and ID

MM200 MULTI-RATE MODEM

High Speed Applications with Data Rates to 200 Mbps

This innovative and highly flexible modem is configurable for data rates between 1 and 200 Mbps. The unit allows complete control over modulation density and channel bandwidth for efficiencies up to 6 bits per second per Hz. The unique architecture of the MM200's IF allows large improvements to fading and multi-path via multiple digital equalizers when used with the Nucomm's NuLinx microwave transmitter and receiver. The MM200 is an ideal solution for both new and retrofit microwave link installations. Maximum flexibility is achieved by an internal data multiplexer that combines up to four user selectable data paths into a single data stream. The IF can be field-configured with one to four channels providing total flexibility. Each channel can operate up to 7 Mbaud.

FEATURES:

- Up to four user-selectable data/overhead interfaces
- 4, 16, 32, 64, 128 and 256QAM operation
- Seamless hot standby switching
- Reed-Solomon forward error correction
- Adaptive equalization
- Remote control from network or serial interface
- Companion to Nucomm's NuLinx

INTERFACES:

- G.703 DS3, E3 or STS-1, DVB-ASI, SMPTE-310M
- RS422 parallel, DVB parallel, MP2P
- LVDS parallel, DVB parallel
- T1/E1 wayside
- 10 base T
- OC3 optical, STM1/ STS3

ANALOG CODER 2

Converts an Analog Link into a Digital Link

The Analog Coder 2, a cost-effective solution for upgrading an existing analog microwave link to handle a variety of digital signals, now accepts input data rates from 1 to 30 Mbps. Signals such as the ATSC 19.39 Mbps data stream plus a T1 Data Pack can be transmitted without any loss in signal quality. The inputs and outputs are DVB-ASI and SMPTE-310M. The demodulator outputs a channel 3 or 4, 8VSB RF signal that provides for displaying and monitoring of the HD picture being sent over the microwave link. Optional features include an integrated multiple input multiplexer/demultiplexer, and the simultaneous transmission of up to six audio subcarriers along with the digital signal. The Analog Coder 2 is ideal for single or multi-hop links. HDTV signals have been transported through a 24-hop repeater system using the Analog Coder 2 without any degradation in signal or picture quality.

FEATURES:

- Variable data rates from 1 to 30 Mbps
- Integrated multiple input multiplexer/demultiplexer option
- No retrofit of existing STL required
- Excellent for multi-hop systems
- Multiple interfaces: both SMPTE-310M and DVB-ASI
- FEC includes Viterbi, Reed-Solomon, Interleaving
- Adaptive equalization
- De-jittered SMPTE-310M and DVB-ASI outputs
- T1 Data Pack includes: T1, 2 x RS-232, eight logic inputs, four logic and four form C relay outputs
- Higher output power than digital radios
- Ch 3 or 4, 8VSB output is standard
- RS-232 performance monitoring includes packet errors and signal quality
- HD monitor (set-top box) optional
- Universal AC/DC power supply optional
- Audio subcarrier option

ADVANTAGES:

- Uses existing analog infrastructure
- No modification to existing radios required

V-STREAM 2 8VSB IF MODULATOR/DEMODULATOR

Variable Data Rates from 1 to 30 Mbps

The V-Stream 2 8VSB IF Modulator/Demodulator, using fifth generation technology, accepts any input data rate from 1 to 30 Mbps (including ATSC 19.39 Mbps plus a T1 Data Pack) and outputs a 7.5 MHz bandwidth 70 MHz RF signal using advanced 8VSB modulation. The V-Stream 2 8VSB Mod/Demod is a stand-alone product in a 1RU chassis. When combined with an existing digital-ready STL such as the Nucomm FT6/FR6 series, the V-Stream 2 8VSB Mod/Demod provides a fully functional digital link for transporting such digital signals as the ATSC 19.39 HDTV. The system is variable rate and senses input data rates from 1 to 30 Mbps. The Demodulator also provides a switchable channel 3 or 4, 8VSB RF output that allows display and monitoring of the HD picture being sent over the microwave link.

FEATURES:

- Variable data rates from 1 to 30 Mbps
- Integrated multiple input multiplexer/demultiplexer optional
- The 8VSB advantages (using fifth generation technology):
  - Optimized forward error correction
  - Advanced adaptive equalization
  - Performs well over long paths and multiple hops
  - Monitoring capability – DTV and bit error rate
  - 7.5 MHz spectral efficiency
  - Improved fade margins
- Multiple interfaces: both SMPTE-310M and DVB-ASI
  - TX input auto-detects SMPTE-310M or DVB-ASI
  - RX output – (2) SMPTE-310M, (1) DVB-ASI
  - T1 Data Pack includes: T1, 2 x RS-232, eight logic inputs, four logic and four relay outputs
- RS-232 performance monitoring includes packet errors and signal quality
- Universal AC/DC power supply optional

PRIMUS

Integrated MPEG2 Encoder, Multiplexer and Modulator

Nucomm's Primus is an incredibly versatile product providing solutions to many applications for the television broadcaster.

Primus incorporates the functions of MPEG2 encoders, a multiplexer and modulator all into one unit. With a modular card design, the user can select up to four video channels and encoding them using the integrated 4:2:2/4:2:0 encoders. These four streams are then multiplexed into one transport stream. Then using a customer selected modulation scheme, the signal is sent to the transmitter.

Modulation choices include COFDM, VSB, QAM and Nucomm's Analog Coder modulation. Incorporating the Analog Coder modulation gives you the unique ability to use existing analog only transmitters and receivers and still create a digital link. By installing Primus into your existing analog only link you will have the capability of encoding up to four different video inputs and transmitting these four channels with equipment you thought you were going to have to replace.

FEATURES:

- Up to four integrated MPEG2 encoders — 4:2:2/4:2:0
- Built-in Multiplexer
- COFDM, VSB, QAM or Analog Coder modulation
- Composite, SDI and ASI inputs/outputs
- Can be used with analog only or digital ready transmitters and receivers
- Up to four analog audio or AES/EBU digital audio per video channel
- Advanced error correction
- Remote control via RS232 or RS485
- NTSC/PAL switchable
- Universal AC power supply – 90 to 240 VAC

OPTIONS:

- Universal AC and DC power supply – 90 to 240 VAC and 11 to 32 VDC
- 4:2:0 only encoding

8 VSB is the ATSC standard currently used for the transmission of HDTV by broadcasters today. Other versions of VSB, such as 2VSB have proven to be ideally suited for ENG applications. 2 VSB has shown to have many of the advantages of COFDM in an ENG environment with the added advantage of being much more bandwidth efficient. This becomes particularly useful with the new 2 GHz reconfiguration.

M2-ENCODER 1

Rack-Mounted MPEG2 Encoder

The Nucomm's M2-Encoder-1 is a lightweight and versatile MPEG2 video encoder. The M2-Encoder-1 is housed in a 1RU case. The M2-Encoder-1 has a self-contained power supply that accepts 100 to 260 VAC. An optional universal AC/DC power supply is available. Applications include fixed, portable and mobile systems such as STL, ENG airborne and satellite.

FEATURES:

- Inputs:
  - Composite, component, ASI and SDI
  - Audio: 2 Analog, 1 AES/EBU
- Output:
  - DVB-ASI and SDI
- 4:2:0/4:2:2 encoding
- PAL and NTSC compatible
- RS-232 remote control and monitoring
- Three preset quick keys
- Data Rates front panel selectable to 50 Mbps
- Internal or external clock
- Optional color bars with ID

M2-DECODER 1

Rack-Mounted MPEG2 Decoder

The Nucomm M2-Decoder-1 is a lightweight and versatile MPEG2 video decoder. The M2-Decoder-1 is housed in a 1RU case. The M2-Decoder-1 has a self-contained power supply that accepts 100 to 260 VAC. An optional universal AD/DC power supply is available. Applications include fixed, portable and mobile systems such as STL, ENG airborne and satellite.

FEATURES:

- Inputs:
  - DVB-ASI and SDI
- Outputs:
  - Video: composite, component, ASI and SDI
  - Audio: 2 Analog, 1 AES/EBU
- 4:2:0/4:2:2 decoding
- PAL and NTSC compatible
- RS-232 remote control and monitoring
- Three preset quick keys
- Accepts input data rates to 50 Mbps

GA LINK

MPEG2 Interface Converter for DTV

The GA Link solves system interface problems such as connecting the output of a HDTV encoder that only provides a DVB-ASI output to the input of a HDTV Transmitter that only accepts SMPTE-310M. The GA-Link is the generic name for an MPEG 2 interface converter box that is custom configured to each customer specification such as DVB-ASI to SMPTE-310M. A broad range of configurations is available from a library of designs.

INTERFACES:

- DVB-ASI to SMPTE-310M
- SMPTE-310M to DVB-ASI
- Serial ECL to SMPTE-310M
- Serial TTL to SMPTE-310M
- DVB parallel/ECL to DVB parallel/LVDS
- DVB parallel/LVDS to DVB parallel/ECL
- Other interfaces available
- Rate conversion
- 19.39 Mbps locked to 10 MHz GPS

NEWSCASTER VT2

ENG/OB Van Transmitter (HD Expandable)

Newscaster VT2
Digital/Analog ENG/OB Van Transmitter

Newscoder TX3
COFDM/MPEG2 Modulator/Encoder

The Newscaster VT2 is a major step forward in van transmitter technology and offers more useful features than any other product in its class. The VT2 is available in 2, 7, 13 GHz single band or 2+7 GHz dual band configurations. The digital engine is comprised of a 4:2:2/4:2:0 encoder, with a low delay mode of less than 100 msec (fully MPEG2 compliant), and a DVB-T compliant COFDM modulator with full control over the modulation formats, bandwidth, data rate and guard interval. A wide array of inputs are provided, including—video/audio, SDI (with embedded audio), ASI and 70 MHz. Two audio inputs are provided standard, while four audios are available. The VT2 contains an SDI to composite converter for FM operation, Run your entire vehicle on SDI!

The VT2 features software generated modulation formats that are stored in onboard, circuit board proms. Available formats include – FM (NTSC/PAL) and COFDM. Other formats include single carrier QAM, VSB, and DVB-S.

The VT2 is easy to use due to its seven quick keys, and six lockable *quick-store* presets, avoiding the need to frequently drill deep into complicated menus. Channel plans for both the existing 2 GHz band and the new 2 GHz band are provided and the user can customize the frequency and bandwidth according to his needs. An LCD *smart display* provides complete system control and allows setup of more advanced features.

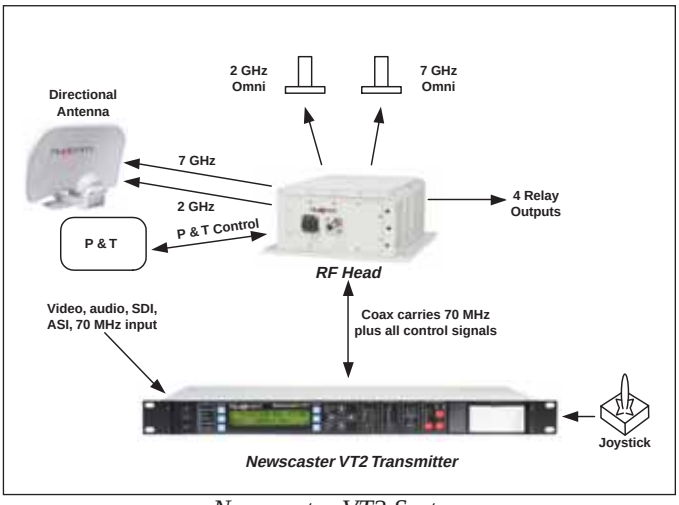
High output power is a huge advantage for ENG operations working in a competitive environment, and the VT2 is available with up to 10 watts of digital output power. It is configured with an AC power supply that accepts input voltages from 100 to 240 VAC.

FEATURES:

- Space-saving single rack unit design
- Digital RF power to 10 watts
- Integrated, selectable, analog FM, and DVB-T, COFDM plus optional third format
- SD-MPEG 4:2:2 and 4:2:0 encoding supporting 4:3 and 16:9 aspect ratio
- Available in single or dual band configurations
- Frequency agile via preset channels or in 250 kHz steps
- Integral SDI to composite converter for FM operation. Run your entire vehicle SDI!
- Front panel *smart display* for total control
- Seven quick keys for fast access to commonly used functions
- Six *quick-store* hot-buttons to switch between preset parameters
- Single cable (coax or triax) interconnect between control unit and RF Head
- Integrated omni/directional antenna switching
- Dynamic color bars with field programmable ID
- Remote control of all functions via RS-232/RS-485

OPTIONS:

- Low cost single 4:2:0, optional
- Pan and tilt control with optional Joystick
- Third modulation format, select between QAM, VSB and DVB-S
- DC operation
- Universal AC/DC power supply



Newscaster VT2 System

NEWSCODER TX3

COFDM Modulator and MPEG2 Encoder

The Newscoder TX3 COFDM Modulator / MPEG2 encoder is the ideal companion product for ENG/OB operations that already have digital — ready transmitters such as the Newscaster VT1, PT6 or other manufacture's transmitters.

This 70 MHz multi-format modulator includes a COFDM, DVB-T modulator, MPEG2 4:2:2/4:2:0 encoder and can be expanded for other formats including DVB-S, VSB and QAM. The encoder has a low delay of less than 100 msec. and can be operated as a stand-alone encoder with its data rate field programmable up to 50 mbps.

The Newscoder TX3 is equipped with a front panel *smart display* and three *quick-store* preset buttons for quick set up and operator convenience. The TX3 includes a highly efficient AC power supply unit that enables operation from 90 to 240 VAC.

FEATURES:

- COFDM DVB-T compliant QPSK, 16QAM and 64QAM
- MPEG2 4:2:2 and 4:2:0 encoding
- 6, 7 and 8 MHz bandwidth supported
- Multiple modulation formats available for higher data rates, including: QAM, VSB, DVB-S and FM
- Inputs:
  - One composite video plus two analog audio (four audio with digital AES/EBU audio)
  - One SDI digital video with de-embedding
  - One DVB-ASI Input
- Outputs:
  - DVB-ASI from MPEG2 encoder
  - 70 MHz
- Automatic digital-analog change over operation
- Dynamic internal test generator with color bars and ID
- Integral SDI to composite video converter for FM modulation
- RS-232 remote control and monitoring
- Available with satellite DVB-S or low cost 4:2:0 encoder

TP6D/PA6D/UPA10D

Digital ENG/OB Truck Package Transmitter Systems

The TP6D system is ideal for those who want the versatility of having a full up transmitter in the van that can be easily removed for tripod mounted portable applications when the need arises. The system includes a ChannelMaster Transmitter plus a high power mast mounted amplifier. The system is configured with an FM modulator, MPEG2 encoder and a DVB-T compliant COFDM modulator. A rack mounted power supply/control unit allows antenna polarization control, hi/low amplifier switching and readout of the RF power at the antenna. The system is available in either 2 or 7 GHz single band or 2+7 GHz dual band configurations. Power amplifiers available include, 12 W analog/5 W digital at 2 GHz, 10 W analog/5 W digital or 5 W analog/2 W at 7 GHz. An ultra high power amplifier yielding 10 W digital is optionally available.

FEATURES:

- Digital/analog operation
- Integrated FM, COFDM and MPEG2 encoder
- Antenna polarity control
- High low power RF control
- Dynamic color bars with field programmable ID

SYSTEM INCLUDES:

- ChannelMaster Transmitter
- Mast mounted, RF amplifier
- PS15SD, control drawer/power supply unit
- Power amplifiers available include:
  - 12 W analog/5 W digital at 2 GHz
  - 10 W analog/5 W digital or
  - 5 W analog/2 W digital at 7 GHz

OPTIONS:

- Ultra high power 10 W digital amplifier

Omni Directional Transmit Antenna

ENG/OB Van Antennas

Omni Directional Transmit antennas are used in COFDM digital ENG/OB systems as supplemental antennas to the main transmit antenna such as the Nucomm Newsblaster. These antennas, available in linear polarization, often provide for quick short-range shots without the need for raising the main antenna mast. An omni antenna also provides for moving digital/COFDM shots (conditions permitting). The Omni Antennas are available with either 2 dB or 5 dB gain. Higher gain models are available upon request. For airborne transmit antennas see the COFDM SkyMaster antenna on page 13.

Features:

- Available in either 2 or 7 GHz models
- Van mounting brackets optionally available
- Other frequency bands available upon request

Newsblaster/Megablaster

ENG/OB Van Antennas

The Newsblaster or Megablaster ENG/OB Van Transmit Antenna Series is the finishing touch to a digital or analog ENG/OB van transmit system. These high gain antennas are available in single- and multiple-band configurations and with all popular polarization formats. Certain models are available with solid-state switching. For even higher gain requirements, the Megablaster is the perfect choice. For airborne transmit antennas see the SkyMaster antenna on page 13.

Features:

- Low profile, offset feed design
- Single, dual and quad polarity, remote selectable
- Rugged honeycomb/fiberglass design
- Excellent front to back ratio and sidelobe performance
- Lightweight
- Mounts directly to Quickset QPT90 pan & tilt head
- Solid state switching models available
- Newsblaster
  - Single, dual and tri-band models
  - Gain: 20 dBi at 2 GHz, 30 dBi at 7 GHz, 34 dBi at 13 GHz
  - Reflector size: 21” H x 25” W, weight 27 lbs
- Megablaster
  - Single and dual band models
  - Gain: 23 dBi at 2 GHz, 34 dBi at 7 GHz
  - Reflector size: 54” W x 37.5” H, weight 40 lbs

ChannelMaster TX1/RX1

Analog and Digital Dual Band Portable Transmitter and Receiver

The ChannelMaster TX1/RX1 follows in the proud footsteps of Nucomm's highly reliable, industry standard PT3/RX3 and PT6/RX6 portable microwave system. Its features are designed to serve every portable environment — from tripod, backpacks, helicopters and ENG trucks. Nucomm's innovation and creativity has produced a new class of lightweight, feature rich, portable microwave radio. These features include integrated modulation that is software configurable between COFDM, Analog, QAM and VSB in a single radio. In addition the ChannelMaster is switchable between both 2 and 7 GHz. Input and output interfaces include, composite video, DVB-ASI, SDI with embedded audio.

The ChannelMaster is available in bands from 1.3 to 15.4 GHz. For worldwide operation, a universal AC/DC power supply enables operation from both 90 to 240 VAC and 11 to 32 VDC. Other DC voltage ranges are available.

Features:

- Available in single band or 2+7 GHz dual band
- COFDM/MPEG2 and FM analog standard
- Video 4:2:2 & 4:2:0 with low delay mode
- Four analog and two AES/EBU audio available
- Universal AC/DC power supply
- DVB-ASI, SDI with embedded audio
- Dynamic color bars with field-programmable ID
- Front panel LCD programmable
- Five preset keys (ideal during the FCC transition)
- Remote controllable by RS232/485
- High RF output power 12 watts at 2 GHz; 5 watts at 7 GHz
- NTSC/PAL with auto switching
- High performance as measured in MER
- Compatible with existing Nucomm portable antennas

Options:

- Dual carrier COFDM
- VSB or QAM modulation
- External 10 W digtial power amplifier

ChannelMaster TX2/RX2

Digital/Analog ENG/OB Two Box Portable Transmitter/Receiver Covering 1.3 to 15.4 GHz

The ChannelMaster TX2/RX2 digital/analog portable microwave is a "two box" version of Nucomm's popular "single box" ChannelMaster TX1/RX1. Like its sister product these units are the next generation, feature rich, high performance portable microwave radio. Features include, multiple integrated modulation modes, ultra low noise Yig Oscillators and linearized RF power amplifiers to name a few. Modulation formats are selectable between FM, COFDM, VSB or QAM. Choose any three to be loaded as software. The ChannelMaster series is available in single or dual band configurations in frequency bands from 1.3 to 15.4 GHz. All radios are equipped with a universal AC/DC power supply that will operate from 90 to 240VAC or 11 to 32VDC. Please consult Nucomm for other DC ranges.

Features:

- Available in single band or 2+7 GHz dual band
- COFDM/MPEG2 and FM analog standard
- Video 4:2:2 & 4:2:0 with low delay mode
- Four analog and two AES/EBU audio available
- Universal AC/DC power supply
- DVB-ASI, SDI with embedded audio
- Dynamic color bars with field-programmable ID
- Front panel LCD programmable
- Five preset keys (ideal during the FCC transition)
- Remote controllable by RS232/485
- High RF output power 12 watts at 2 GHz; 5 watts at 7 GHz
- NTSC/PAL with auto switching
- High performance as measured in MER
- Intercom between control and RF Head

Options:

- Dual carrier COFDM
- VSB or QAM modulation
- External 10 W digtial power amplifier

CAMPAC

COFDM Camera-Back Transmitter for 2 or 7 GHz Frequency Bands

The CamPac, a miniature 2 or 7 GHz COFDM wireless camera transmitter delivers full broadcast quality in a small, lightweight, rugged aluminum case that fits on the back of a portable video camera.

The CamPac is designed with an integrated 4:2:2/4:2:0 MPEG2 encoder and a COFDM modulator for clear reception in a multi-path environment. The CamPac accepts NTSC or PAL composite, component or SDI video.

Field programming is through a large LCD allowing up to 128 field programmable channels and 5 user presets. Each preset can be programmed to set transmitter frequency, operating parameters such as power output, video and audio input types and COFDM modulation types.

FEATURES:

- 1.99/2.5 GHz; 2.3/2.7 GHz; 6.4/7.1 GHz
- Integrated COFDM/MPEG2
- 4:2:2/4:2:0 encoding
- DVB-T Compatible, DVB-S optional
- 0.25 watt
- 18 watts of DC power consumption
- <100 ms delay
- Wide input voltage range (8-30V)
- NTSC/PAL compatible
- Composite, component or SDI Video
- 2 selectable audio — analog and AES/EBU
- De-embedded SDI (four audio optional)
- Mounts directly with Anton Bauer battery clip or Sony V-Clip (optional)
- Superior adjacent channel performance -40 dBc IMD
- Standard connectors, no dongles or adapters required
- Remote controllable via RS-232 and IRDA
- 4-input diversity receive systems

GOPAC

Mini COFDM Microwave Transmission System with Integrated MPEG2

The GoPac™ is a compact portable transmitter docking station designed specifically for the CamPac miniature wireless camera back transmitter. The GoPac extends the usefulness of the CamPac from a low power wireless camera back transmitter to a fully functional high power portable ENG transmitter. Ideal for reporter-on-the-go or for fast breaking news stories where a camera operator can get the shot back from virtually any vehicle.

The GoPac includes a selection of removable power amplifiers (up to 10 W digital), DC power supply, CamPac remote control, SDI/ASI and video/audio inputs. Packaged in a suitcase type of carrying case for ease of transport and operation the GoPac is on the Go!

FEATURES:

- GoPac docking station allows quick transition from wireless camera unit to a high power portable transmitter
- Lightweight suitcase design for ease of operation and transport
- Wide variety of omni (magnet mount available), directional, sector, quad sector and pod antennas with GPS
- Dash mount remote control unit available
- Video inputs include; composite, component and SDI de-embedded
- Audio inputs include: 2 analog audio, 1 AES/EBU
- Anton Bauer or Sony V Clip mounts
- High power amplifier configurations to 10 W digital
- Removable amplifier tray for mast-mount applications

PT3/RX3

Portable Analog Transmitter: Single and Multi-Band Units Cover 1.3 to 15.4 GHz

The PT3/RX3 single box units are designed for analog ENG or OB trucks, tripod or airborne applications and are NTSC and PAL compatible. The PT3/RX3 features are designed to serve every portable environment – from tripods and backpacks to helicopters and ENG/OB trucks. The PT3/RX3 are extremely rugged and sealed in a diecast aluminum clamshell enclosure which protects against weather and abuse.

Features:

- Rugged and weather resistant clamshell housing
- Available in single, dual or tri-band configurations
- Signal-strength beeper for easy alignment (RX3)
- Signal-strength meter with actual signal strength: digital and analog display (RX3)
- Universal power supply, 100-260 VAC, 11-32 VDC
- Field-selectable audio subcarriers
- Quick connect antenna mount
- Line and mic operation with auto gain control and over-modulation LED (PT3)
- Remote control interface
- PAL or NTSC compatible

Options:

- Internal signal generator with front panel control color bars and 16-character ID (PT3)
- Switchable IF filters
- High power configurations

SkyMaster and SkyMaster Lite

GPS Electronically Steerable Pod Antenna Systems

The SkyMaster is a 2 GHz band, all solid-state, airborne antenna for digital and analog video downlink applications with a gain of 13 dBi (SkyMaster Lite has a gain of 11 dBi).

The SkyMaster, developed specifically for COFDM digital applications, is an electronically steerable pod antenna system with an integral GPS receiver that provides fully automated steering in airborne applications. The electronic steering feature eliminates moving parts, which can be a source of failure, and replaces them with time tested electronic steering. The SkyMaster Lite is designed for budget conscious operations and is ideal where a smaller physical footprint is desired and a lower system gain of 11 dBi is acceptable.

Features:

- Specifically designed for COFDM operation
- Improved digital performance
- Smaller and lighter weight than electro-mechanical steerable antennas
- 13 dB gain at 2 GHz (SkyMaster Lite 11 dB gain)
- Integrated GPS receiver and compass
- Integrated down-look receive antenna with optional tunable filter
- All solid-state and no moving parts result in excellent reliability
- Small and simple handheld controller with clearly marked touch-screen buttons
- Selectable omni, manual or tracking mode
- Compact handheld device controls both the antenna and transmitter
- Configurable for transmit and receive applications
- Also available for 7 GHz systems

Portable Remote Controller

Controls all Nucomm Portable Radios

Nucomm offers remote control units that are ideal companion units to the ChannelMaster Transmitters and Receivers. These units, popular for airborne applications, are equipped with standard TX/RX control features and offer LED indication of alarm, RF power, standby, video and receive carrier level. The hand held controller is a popular accessory item for the GoPac transmission system allowing for remote operation of this alternative ENG COFDM transmission system.

Features:

- Hand held and panel mount configurations
- Ideal for the ChannelMaster or the GoPac series
- Transmitter control functions include:
  - -Frequency/Channel Selection
  - -High/Low Power
  - -Analog/digital operation
- Receiver control functions include:
  - -Frequency/channel selection
  - -Analog/digital operation

Helicopter Aero-Frame

Efficient Mounting System for Nucomm Portable Radios

Nucomm's Aero-Frame is a small and lightweight half mounting rack for easy installation of Nucomm portable radios into various types of aero vehicles such as helicopters, airplanes and blimps. This half rack unit easily mounts in baggage compartments with two to four mounting screws. The Aero-Frame can be supplied with either AC or DC power strips on one side.

Features:

- Small and lightweight
- Half Rack mounting width
- Easy to mount in all types of aero vehicles
- Designed for *all* Nucomm portable products
- Available in two heights, for mounting two or four Nucomm portable radios

MEGAHORN

Portable ENG/OB Antennas

FEATURES:

- Frequency bands 1.3 to 15.4 GHz
- High gain, small footprint
- Ideal for wideband operation
- Linear and circular polarity models
- High front to back ratio, low sidelobes

The Megahorn Antenna Series offers a rugged, lightweight design that provides for quick antenna setup. These antennas are available in bands between 1.3 and 15.4 GHz and in a variety of gains. The compact size makes the Megahorn ideal for packing in transit cases and for use in portable tripod applications. Two versions are available—the first provides for direct mounting the Megahorn to a PT/RX portable transmitter or receiver via a Nucomm quick release bracket. This provides for cable-free RF connections and is the preferred configuration for tripod portable configurations. The second version provides "N" type connectors and is commonly used for pole or mast mounting applications. Pole mounting kits are available. Megahorns are commonly used on ENG/OB vehicles as supplemental transmit and receive antennas.

PORTABLE PARABOLIC

HIgh Gain Antennas

FEATURES:

- Frequency bands 1.3 to 15.4 GHz
  - 1, 2, 3, and 4' reflector sizes
- Rugged aluminum spun reflector
- Ideal for wideband operation
- High gain
- Linear or circular polarity
- Dual polarity models available
- Fast and easy set up
- High front to back ratio, low sidelobes

The Portable Parabolic Antennas are ideal when high gain becomes the overall system consideration. Two versions are available, the first providing for direct mounting of the antenna to a PT/RX portable transmitter or receiver via a Nucomm quick release antenna mounting bracket. This provides for a cable-free RF connection and is available for 1' or 2' models only. The second configuration provides a type "N" connection, mounting to a PT/RX Portable transmitter or receiver via an optional L bracket and RF cable. This version is necessary for 3 and 4' models.

Truncated Portable Antennas

Frequency Bands 1.3 to 15.4 GHz

The Nucomm Truncated Antenna is ideal for high gain portable applications. The truncated shape allows for easy packing in a transit case. The antenna feeds quickly snaps in and out using a twist lock vortex. This feature allows for fast antenna feed changing and makes the Truncated Series an ideal companion product to the PT/RX dual and tri-band portable transmitters and receivers. The Truncated Antenna mounts directly to the PT/RX via a Nucomm quick release, antenna mounting bracket.

Features:

- Frequency bands 1.3 to 15.4 GHz
- Linear or circular polarity
- Rugged, lightweight
- Fast and easy setup
- High front to back ratio, low sidelobes
- Available sizes
  - TD1, 7 x 14" reflector direct mount
  - TD2, 15 x 24" reflector direct mount

Portable Specialty Antennas

Nucomm offers a complete range of antennas for a wide variety of applications including tripod mounted portables, camera mounting omni, sports antennas and van transmit/receive antennas. Nucomm can supply special purpose antennas for custom requirements upon request.

Features:

- Omni-directional antennas
- Up/down look antennas
- Directional antennas
- Other specialty antennas available upon request

Portable Accessories

Portable Accessories:

- Remote control units
- Heavy-duty and super heavy-duty tripods
- Transit cases, all sizes
- Soft antenna carry bags
- Batteries, all types
- Cables and connectors
- Rain shields for PT/RX
- “L” brackets
- Monopod/walking stick
- Other accessories available upon request

NEWSCASTER CR6D

Digital/Analog ENG/OB Central Receiver

The Newscaster CR6D is a high performance central receiver that has a feature set that will enhance any digital/analog ENG operation and the flexibility required for the 2 GHz relocation. This highly sensitive central receiver offers superb adjacent channel performance. This highly sensitive central receiver offers superb adjacent channel performance. The CR6D operates in the 2 GHz band and can be configured for multiple band operation using external block down converters. For accurate digital signal alignment, BER, RSL, and MER are provided, and an internal spectrum viewer is offered as an option. The CR6D uses the DVB-T COFDM standard, and is compatible with other manufacturer's transmitters using the same standard. In addition, the RS232 and parallel interfaces make the CR6D compatible with most remote control systems. An Ethernet interface is also included. A unique feature of the CR6D is its ability to automatically maintain a fixed one volt pk-pk output for various signal deviations, such as a 3mhz deviation. when receiving a 2 GHz signals or 4 MHz deviation from 2.5, 7 and 13 GHz signals.

FEATURES:

- **Up to three modulation formats; FM, COFDM standard and VSB or QAM optionally available**
- **Dual or triple band operation using external block down converters**
- **Internal spectrum viewer, optional**
- **Provides one volt video ouput independent of 3 or 4 MHz FM modulation deviation—auto sensing**
- **RS232 and parallel remote control interface provide compatibility with most ENG/OB Remote Control Systems**
- **Outputs include, video, composite, SDI & ASI**
- **Ultra low noise Yig Oscillator**
- **Front panel *smart display* of RCL, receiver parameters and diagnostics.**
- **Ethernet interface**
- **Easy system integration**

NEWSCODER RX3

COFDM Demodulator/MPEG2 Decoder

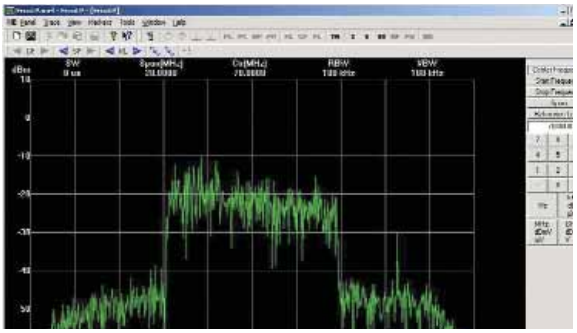
The Newscoder RX3 Series is an innovative 70 MHz COFDM demodulator and MPEG2 decoder in a 1RU case. It is an ideal companion to any digital central receiver. The Newscoder RX3 is designed with the features needed for ENG/OB central receiver systems where performance is critical. The unit outputs one video, two analog audios, two digital audios and a SDI digital video transport stream. A DVB-ASI is also outputted from the COFDM demodulator. The MPEG2 decoder can be independently fed by a DVB-ASI input. For portable operation such as in helicopters, the Newscoder RX2 Portable version is also available.

FEATURES

- **COFDM DVB-T compliant; QPSK, 16QAM and 64QAM**
- **4:2:0/4:2:2 decoding**
- **Auto-senses COFDM parameters modes**
- **6, 7 and 8 MHz bandwidth supported**
- **Outputs:**
  - **One composite video plus two analog audio**
  - **One SDI digital video plus AES/EBU digital audio**
  - **Digital transport stream by DVB-ASI**
- **Input:**
  - **DVB-ASI to MPEG2 decoder**
- **PAL and NTSC compatible**
- **Three preset quick keys**
- **RS-232 remote control and monitoring**
- **Third modulation format scheme: QAM, VSB, DVB-S**
- **Up to four analog audio channels**

COFDM SPECTRUM VIEWER

Remote COFDM ENG/OB Operation



The COFDM Spectrum Viewer gives master control a new, unique and powerful tool for analyzing and tuning in ENG shoots that otherwise may be marginal or lost. The COFDM Spectrum Viewer attaches to the 70 MHz output of a central receiver and sends the resultant channel spectrum back to master control over a low data-rate telephone, network or internet communication channel to be viewed and controlled through a remote terminal, such as a PC computer.

With the Spectrum Viewer, master control can now examine selected channels, as well as adjacent channels for interference before ENG operation begins. Once ENG operation begins, the viewed spectrum is invaluable in tuning the signal.

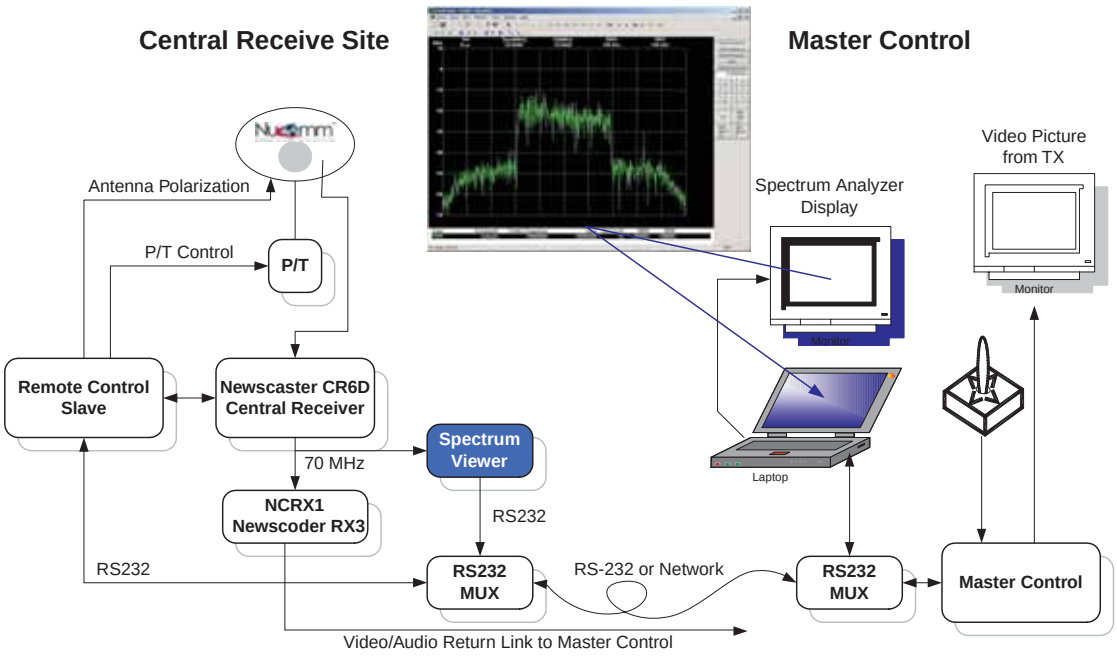
In COFDM operation, the signal is spread over 8 MHz and often difficult to detect when the signal is weak. The COFDM signal can be seen on the Spectrum Viewer before the signal strength meter shows the presence of a signal. By viewing a COFDM signal spectrum, the antenna can be adjusted to minimize multi-path interference and maximize the signal level.

FEATURES:

- Identifies the signal before the picture appears
- Observes receiver IF spectrum on a remote terminal
- Uses low data-rate telephone, network or internet connections
- Remote control of spectrum viewer
- Observes channels for interference
- Identifies COFDM lock-up problems caused by:
  - Interfering signals
  - Adjacent signals
  - Multi-path
  - LNA saturation
- Helps tune in very weak signals

Often the COFDM receiver/decoder will not lock up because of deep multi-path notches within the 8 MHz signal or because of a strong signal that can saturate the receivers LNA. By viewing this signal on the Spectrum Viewer, the operator can make a slight adjustment of the antenna and eliminate the lock-up problem, thus improving the reliability of the received video.

Operation of the Nucomm *Spectrum Viewer*



ProScan DR3 and ProScan DR4

Cosecant Squared, Steerable Central Receive Antenna Systems

The Proscan DR3 and DR4 antenna systems represent the highest gain ENG central receive antenna systems currently available. The cosecant squared reflector design virtually eliminates requirements for elevation travel in many applications.

The antenna incorporates a solid-state switching feed with a dynamic range LNA/filter. The ProScan is fully set up for COFDM digital operation and offers the latest BAS relocation filters for operation in both the current and the new US 2 GHz band.

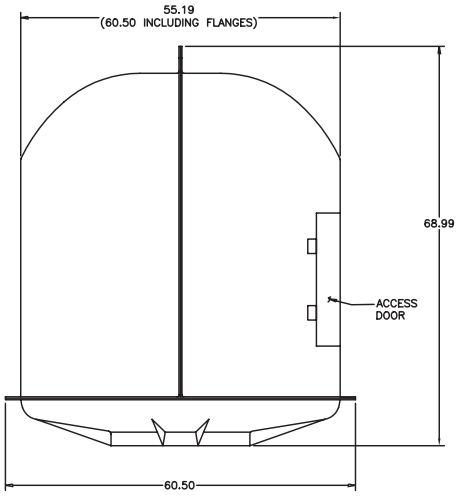
Available in single and multi-band configurations, a selection of block downconverters are available including 6/7, 12/13 and 14/15 GHz. In addition to the 2 GHz features listed above, the ProScan DR4, can accommodate up to four filters and incorporates a new high performance 7 GHz, RF chain for improved sensitivity and digital signal overload performance critical to today's digital ENG operations. Product enhancements and innovations include: new third order intercept point to help prevent over-saturation of receivers, 7 GHz cavity band pass filter for better out of band rejection, new 7 GHz LNA 0-12 dB, linearized LNB and quad pole pin diode switch.

The ProScan is available in either non-continuous or continuous configurations. Continuous rotation is preferred for helicopter or fixed wing aircraft, auto tracking applications.

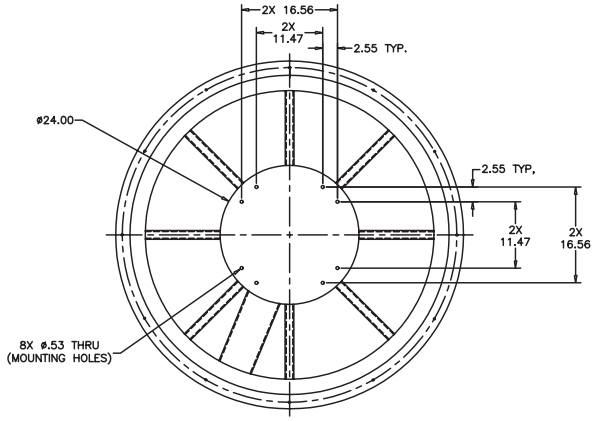
Features:

- ProScan DR3 and ProScan DR4:
  - 1.4 meter cosecant squared design
  - Capable of both analog and COFDM digital operation
  - Real-time diagnostic troubleshooting feedback from antenna to master controller
  - New integrated three piece radome design with access door
  - New US 2 GHz BAS relocation filter
  - Selectable filters for operation at both the current and the new US 2 GHz bands
  - Antenna gain, 26 dBi at 2 GHz, 36 dBi at 7 Ghz, 41 dBi at 13 GHz
  - 24db gain LNA (2 GHz) with remote 24/12 db gain reduction switching on LNA
  - Optical encoders eliminate conventional potentiometers
  - 2/2.5, 6/7, 12/13, 14/15 GHz bands
  - Single, dual and tri-band models
  - Quad polarization (H, V, LCP, RCP)
  - Rugged dual speed rotator
  - Serial data control interface
- Proscan DR4:
  - Capable of four selectable filters
  - New, High Performance 7GHz RF Chain
  - 12 db gain LNA (7 GHz) with remote 12/0 db gain reduction switching on LNA
  - 7 GHz cavity band pass filter

Dimensions



Mounting Hole Pattern



FRONTAL DRAG:

75 MPH : 570 lbs.

85 MPH : 646 lbs.

125 MPH : 949 lbs.

ULTRASCAN DR2 AND ULTRASCAN DR3

Low Profile, Steerable Central Receive Antenna Systems

The UltraScan DR2 and DR3 are ENG Central Receive Antenna systems and are ideal when tower space and wind-loading are a prime consideration. The UltraScan is a pan only antenna system. The antenna incorporates a solid-state switching feed with a dynamic range LNA/filter. The UltraScan is fully set up for COFDM digital operation and offers the latest BAS relocation filters for operation in both the current and the new US 2 GHz band.

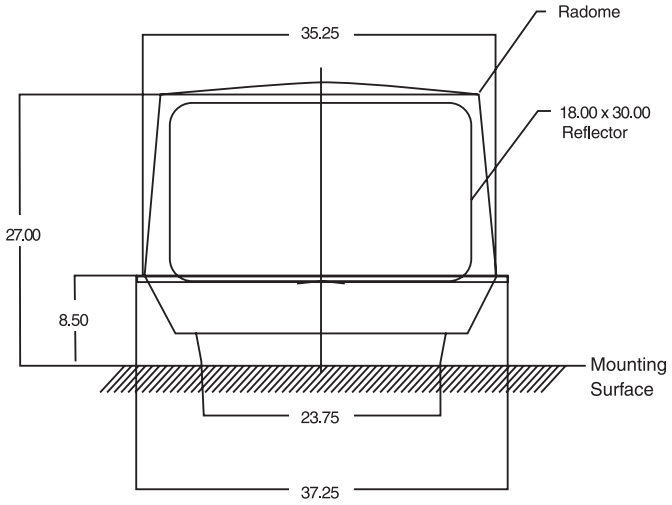
Available in single and multi-band configurations, a selection of block downconverters are available including 6/7, 12/13 and 14/15 GHz. In addition to the 2 GHz features listed above, the UltraScan DR3, can accommodate up to four filters and incorporates a new high performance 7 GHz, RF Chain for improved sensitivity and digital signal overload performance critical to today's digital ENG operations. Product enhancements and innovations include new third order intercept point, band rejection, new 7 GHz LNA 0-12 dB, linearized LNB and quad pole pin diode switch.

The UltraScan is available in either non-continuous or continuous configurations. Continuous rotation is preferred for helicopter or fixed wing aircraft, auto tracking applications.

FEATURES:

- **DR2 and DR3:**
  - **Low profile, low wind-loading**
  - **Compact two piece radome**
  - **Capable of both analog and COFDM digital operation**
  - **Antenna gain, 20 dBi at 2 GHz, 30 dBi at 7 GHz, 34 dBi at 13 GHz**
  - **Single, dual and tri-band models available**
  - **2/2.5, 6/7, 12/13, 14/15 GHz bands**
  - **New US 2 GHz, BAS relocation filter**
  - **Selectable filters for operation at both the current and the new US 2 GHz bands**
  - **24 db gain LNA (2 GHz) with remote 24/12 db gain reduction switching on LNA**
  - **Optical encoders eliminate conventional potentiometers**
  - **Quad polarization (H,V,LCP,RCP)**
- **UltraScan DR3:**
  - **Capable of four selectable filters**
  - **New high performance 7 GHz RF chain**
  - **12 db gain LNA (7 GHz) with remote 12/0 db gain reduction switching on LNA**
  - **7 GHz cavity band pass filter**

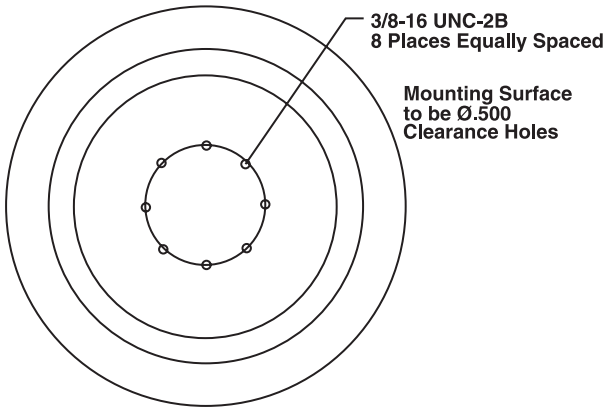
Dimensions



Windload——81 lbs @ 60 mph
353 lbs @ 125 mph

Weight——65 lbs total

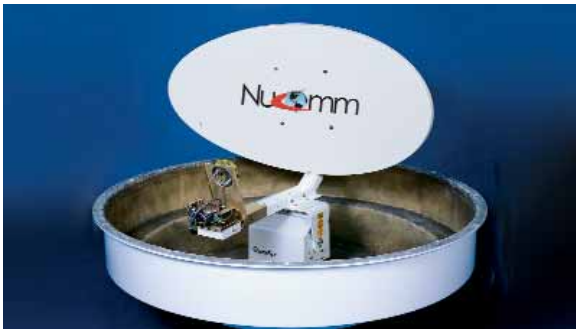
Mounting Hole Pattern



Mounting Hole Pattern

ELLIPSE DR2

Steerable Central Receive Antenna System with Pan and Tilt



The Ellipse DR2 ENG Central Receive Antenna System is ideal when control over both the antenna azimuth and elevation is desired. The antenna incorporates a solid-state switching feed, with high dynamic range LNA/filter and offers the latest BAS relocation filters protection. A choice of 6/7, 13, 14/15 GHz block downconverters is provided. The 7 GHz version comes standard with a digital-ready DRO for COFDM operation. The Ellipse is available in either non-continuous or continuous configurations. Continuous rotation is preferred for helicopter or fixed wing aircraft, auto tracking applications.

FEATURES:

- Dual axis pan and tilt control
- Compact two-piece integrated radome with access door
- Antenna gain, 23 dBi at 2 GHz, 34 dBi at 7 GHz, 36 dBi at 13 GHz
- Single, dual and tri-band models available
- 24 dB gain LNA (2 GHz) with remote 24/12 dB gain reduction switching on LNA
- Digital-ready
- New optical encoders eliminate conventional potentiometers
- 2/2.5, 6/7, 12/13, 14/15 GHz bands
- Quad polarization (H,V, LCP, RCP)
- New US 2 GHz BAS relocation filter

DIGITAL-READY UPGRADE KIT

2 and 7 GHz Central Receive System

Nucomm offers a wide variety of field replacement antenna feed upgrade kits for existing steerable antenna systems. These kits contain and entire feed assembly which can be installed in a very short time. The kits contain U.S. 2 GHz, BAS relocation filters, linearized LNA's and DRO's, for COFDM digital operation.

Also available are digital and BAS 2 GHz upgrade kits for Sector and Omni Pole receive systems.

Contact Nucomm for a complete listing of antenna upgrade kits.

FEATURES:

- Upgrades existing 2 and 7 GHz steerable central receive antenna systems to digital-ready
- LNA has high dynamic range in the 2/2.5 GHz band with switchable 24/12 dB gain
- Provides the required frequency accuracy for digital signals utilizing COFDM technology
- Phase-locked DRO design, high stability
- Low phase-noise
- New US 2 GHz, BAS relocation filter
- Latest solid-state switching

FLAT PANEL SECTOR SCAN

90° Sector ENG Receive Antenna System

The flat panel antenna can be purchased as a stand alone antenna to cover a specific 90° coverage area, or can be combined with up to four sectors providing a complete 360° system.

Complete sector systems are configured according to each customer location, application and system configuration. Please consult Nucomm with specific requirements for system design assistance.

FEATURES:

- Available in 2, 7 and 13 GHz bands
- Single, dual and tri-band systems
- 13 dBi gain standard, higher gain 16 dBi available on 2 GHz models
- Flat panel, lightweight and rugged design
- Low wind loading
- Easily installed
- Advanced solid-state switching
- Standard mount 2.5-4.5 in diameter
- Switchable 2+7 GHz LNA
- Capable of both analog and COFDM digital operation
- 7 GHz Models have new, high performance RF Chain

OPTIONS:

- 15 degree downtilt kit available
- Local and full remote control systems available
- LNA, block downconverter, digital DRO, BAS relocation filter available

QUAD SECTOR

Sectorized Central Receive Antenna System

The Quad Sector Antenna represents a new design approach to ENG central receive antenna systems.

This 2 GHz antenna will provide 360° coverage at a much higher gain level than a traditional omni and at a fraction of the cost of a sector or steerable receive antenna system. The antenna sectors can be switched locally or via an optional remote control system.

FEATURES:

- 1.9 - 2.5 GHz
- Four switchable 90° sector arrays within a single radome
- High gain, 16 dBi, vertical polarization
- Easily deployed as a temporary or permanent installation
- Non-steerable design eliminates the need for a pan and tilt unit
- Lightweight/low wind loading
- Easily installed
- Highly reliable PCB mounted RF switches
- Includes pole mount kit
- LNA and BAS relocation filter available in a separate weather proof enclosure

OPTIONS:

- Local and full remote control systems are available
- Capable of both analog and COFDM digital operation

OMNI POLE

Omni Directional ENG Receive Antenna

7 GHz

2 GHz

The Omni Pole Antenna is ideally suited where a low cost, low maintenance receive system is desired as a main receive site or as an auxiliary site. The Omni Pole performs best where frequency congestion is at a minimum and short to mid range distance ENG shots are satisfactory. The antenna can be supplied stand alone or with an optional LNA, BAS relocation filter or block downconverter in a separate weather proof enclosure.

FEATURES:

- Provides 360° coverage
- Available in either the 2 GHz or 7 GHz band
- Vertical polarization standard
- Gain, 11 dBi
- Lightweight, low wind load
- No switching or control system required
- No moving parts
- Mounting hardware included
- Capable of both analog and COFDM digital operation
- 7 GHz models have new, high performance RF chain

OPTIONS:

- LNA and BAS relocation filter available in a separate weather proof enclosure
- 7-2 GHz block downconverter with digital DRO available

DIGI-BDC

Digital Block Downconverter

Nucomm's high performance Digi-BDC, (Digital Block Downconverter) is designed specifically for digital ENG/OB central receive antenna systems. The Digi-BDC is designed to pass COFDM and meet the stringent requirements of frequency stability, phase noise, microphonics and temperature.

Many existing antenna systems contain block downconverters designed for analog operation which do not meet the frequency stability and phase noise requirements of digital systems employing COFDM modulation.

FEATURES:

- Single, dual and tri-band configurations
- 7 and 13 GHz, other bands available upon request
- Upgrade existing central receive antenna systems to digital-ready
- Specifically designed to pass COFDM modulation
- Ultra low noise, crystal stabilized, phase-locked DRO
- Stability better than 5 PPM over extreme temperature range

LOW NOISE AMPLIFIER

Nucomm's LNA is ideal as a companion product to a omnidirectional or sector receive antenna or any other antenna that is in need of an LNA to overcome RF cable loss.

FEATURES:

- Single, dual and tri-band configurations
- Designed specifically for COFDM application
- Low noise
- High dynamic range
- Lightning protection
- Single coax carries power and RF
- Power supply included
- Weather proof enclosure
- 24 db gain LNA (2 GHz) with remote 24/12 db gain reduction switching on LNA
- New US, 2 GHz, BAS relocation filter
- 7 GHz models have new high performance RF chain

NAVIGATOR CONTROL SYSTEM

Navigator ENG Remote Control System

The Navigator Control System is designed specifically for television ENG operations. A cost-effective alternative to other control systems on the market, this system will provide remote control and monitoring of a tower mounted steerable antenna system and companion central receiver. The Navigator system includes Windows based master control software to be used with an existing PC, a local control unit (1 per site) as well as two 2 wire dial up modems. Four wire modems are optionally available.

A version of the software is available for controlling 90° Sector Receive Antenna Systems.

FEATURES:

- Windows 95, 98 and 2000 based software
- Local control unit with modems allows control of the antenna & receiver either locally or from a remote site.
- Runs on customer supplied PC/laptop
- Fast and slow pedestal control
- Easy to use graphical interface
- Contains transmit site database
- Cost-effective approach to ENG/OB
- Digital signal parameters displayed

Advanced Capability Master Control System

The Advanced Capability Master Control System is for users looking for a system that can expand and grow as their operation grows. The system offers advanced features found only in top of the line, high capability, remote control systems. The master control unit, LCD monitor and local control unit are ideal where a rack mounted system is desired. The intuitive interface allows for fast and easy operation of the system by novice users, and concurrent monitoring of up to six remote sites on a single screen, this allows even the busiest users to manage the incoming signals with enhanced efficiency. For even greater capability, the multiple networked-masters option allows two or more master controllers to be networked together so that any of the masters can control any of the sites

Features:

- PC based master control unit
- 15” flat panel LCD monitor
  - Touch screen interface
- Intuitive graphical user interface
- Map interface (optional—US only)
- Multi-site control and monitoring capability
  - Control as many antenna/camera sites per system as desired
- On screen real-time video
  - External 10 x 1 video switcher option
- Auto tracking system using Navtrack equipped transmitter equipment
- Controls antenna and or camera sites
- RS-232, RS-422, two wire, dial-up, four wire and master/remote communications lines
- Multiple networked master option
- Advanced capability local control unit
  - Complete central receiver control/status
  - Combination of two antennas and/or cameras or one of each per local control unit
- Displays the Spectrum Viewer output of CR6D Central Receiver
- Displays link quality parameters including, MER, pre/post Viterbi and RCL

Notes:

NUCOMM PRODUCT SUMMARY

Nucomm Innovation Inside™

Digital/Analog STL Systems

Digital/Analog
- NuLinx (p1)
- Dual Stream (p2)
- V-Stream 2 (Digital Only) (p3)
- Seamless Switching (p2)

Analog
- FMT4/FMR4 (p4)

Modems/Codecs
- MM200 Multi-Rate (p5)
- Analog Coder 2 (p5)
- 8VSB IF Mod/Demod (p6)
- Primus (p6)
- M2-Encoder-1 (p7)
- M2-Decoder-1 (p7)
- GA Link (p7)

Antennas
- Directional (p4)
- Waveguide (p4)
- Coaxial Cable (p4)
- Hardware (p4)
- Tower Mounting Products (p4)

Accessories
- Hot Standby
- High Power Amplifier (p3)
- Space/Frequency Diversity Switch
- Duplex
- Simplex

Digital/Analog ENG/OB Systems

Digital/Analog
- Newscaster VT2 (p8)
- Newscoder TX3 (p9)
- ChannelMaster TX1/RX1 (p11)
- ChannelMaster TX2/RX2 (p11)

Analog
- PT3/RX3 (p13)

Antennas
- Newsblaster (p10)
- Omni Directional (p10)

Accessories
- High Power Amplifier (p3)

Digital/Analog Portable & Airborne Systems

Digital/Analog
- ChannelMaster TX1/RX1 (p11)
- ChannelMaster TX2/RX2 (p11)
- CamPac (p12)
- GoPac (p12)
- Newscoder TX3 (p9)
- Newscoder RX3 (p17)
- TP6D/PA6D (p9)

Analog
- PT3/RX3 (p13)

Antennas
- SkyMaster & SkyLite (p13)
- Megahorn (p15)
- Portable Parabolic (p15)
- Truncated (p16)
- Omni Directional (p10)
- Specialty Antennas (p16)

Accessories
- Aero-Frame (p14)
- Remote Controller (p14)
- Tripods (p16)
- Transit Cases (p16)
- Antenna Carry Bags (p16)
- Batteries (p16)
- Rain Shields (p16)

Digital/Analog Central Receive Systems

Central Receivers
- Newscaster CR6D (p17)
- Newscoder RX3 (p17)

Controllers
- Navigator (p24)
- Advanced Capability Master Controller (p25)

Antennas
- ProScan DR3 & DR4 (p19)
- Ellipse DR 2 (p21)
- UltraScan DR2 & DR3 (p20)
- Flat Panel Sector (p22)
- Quad Sector (p22)
- Omni Pole (p23)

Accessories
- Digital-Ready Upgrade Kit (p21)
- COFDM Spectrum Viewer (p18)
- Digi-BDC (p23)
- Low Noise Amplifier (p24)

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