Bruce Woodruff

Experienced technical communicator with broad experience in graphic design, illustration, technical writing, photography, and web design

Advertising
Design & Layout
Illustration
Photography
Technical Writing
Web & Multi-Media

Email: Brucew01@comcast.net

- Advertising design for over 35 US & international trade journals covering broadcast, public safety, & tactical markets.

- Multi-page brochures with product highlights and system overview

Software Driven Radio

for future proof installations

Key Attributes

- MPEG-2 SD/HD Encoding:
  - 4:2:0 and 4:2:2 profiles are standard
- Ethernet I/O for FTP IP File Transfer & Remote Control
- Color Bar Generator
- DVB-T COFDM Modulation
  - QPSK, 16QAM, and 64QAM
- DVB-S Modulation
  - QPSK, 8PSK, 16QAM
- DVB-S2 Modulation
  - Option 1: QPSK, 8PSK
  - Option 2: QPSK, 8PSK,16APSK, 32APSK
- Single Carrier Modulation:
  - QPSK, 16QAM, 32QAM, 64QAM
- IP to ASI Encapsulation
- VSB Modulation
- IEEE 1394 "Firewire" Video streaming input
- HDV compatible

The MTX5000 ENG Mobile Transmitter is a software defined radio that supports simple download and deployment of enhancements and updates. No longer will new features require significant downtime and complex re-configuration. Now changes can be completed in a matter of seconds.

The MTX5000 moves well beyond simple ASIC based encoding and modulation. This platform uses advanced ARM micro-processor controlled FPGAs so that upgrades can be rapidly installed and enabled. For example, installing a state of the art High Definition encoder upgrade is as easy as plugging in a portable USB drive and confirming the upgrade serial number.

MRC has led the ENG industry in technological innovation - from the first twin carrier fixed radio to the first COFDM system. Now with the MTX5000 MRC delivers the ultimate in long term value that is designed to meet the changing needs of broadcasters for years to come.

Front Panel USB 2.0 Port for Field Upgrades

2 GHz BAS Optimized

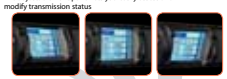
Standard Features for BAS Transition:

- Analog FM Modulation
- COFDM DVB-T Modulation
- Standard 2K Carrier Mode
- RNH Optimized LMS-T Modulation
- Robust LDPC Error Correction
- Fully inter-operable with MRC & LINK MaxRC diversity receivers
- MPEG-2 SD Encoding (HD Optional)

Next Generation ENG

designed for the world's toughest jobs . . .

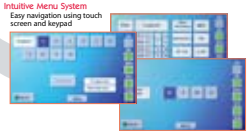
Adjustable Viewing Angle
The adjustable front panel lets you easily assess and modify transmission status



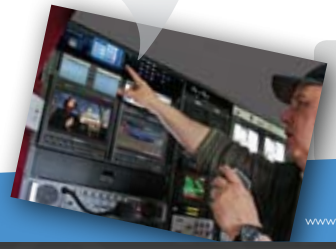
User Friendly Keypad
Robust backlit ergonomic design that takes abuse in the field

Front Panel Interfaces
USB for remote control and rapid firmware updates IEEE1394 for HDV camera support

Intuitive Menu System
Easy navigation using touch screen and keypad



Customizable Display
Access to advanced features with control to meet your specific needs



Next Generation News Gathering

- The industry's first software defined ENG mobile transmitter
- Future proof platform that is software upgradeable in the field–without a PC
- Control RF, Encoding and Modulation from the studio for cost effective news gathering
- Empowers ENG teams to setup and react fast to breaking news stories
- Works seamlessly with MRC's News Gateway platform

Television news gathering is undergoing its most radical transformation since videotape replaced film. Industry leading broadcasters now demand more than just high-definition digital transmission - they require non-linear storage, remote ENG control from the studio, and easy integration of advanced features.

In response to these changes, MRC has developed the MTX5000 to be the broadcasting industry's most advanced and feature rich video transmission system, and the only true software defined SD/HD microwave transport. MTX5000 brings you next generation news gathering, today.

MTX5000 ENG Mobile Transmitter

HD DEFINED IP

Microwave Radio Communications
101 Billerica Avenue Bldg 6
North Billerica, MA 01862-1256 USA
Tel: 1-978-671-5700
1-800-490-5700
Email: sales@mrcbroadcast.com
Web: www.mrcbroadcast.com

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MRC a Vislink company

www.mrcbroadcast.com

Features

for Next Generation ENG

Standard features

- SD Encoding with DVB-T COFDM
- Selection of 2 Antennas
- Front Panel "Touch Screen" GUI with tilting screen
- Advanced Local/Remote Control via a Real Time Operating System (RTOS)
- Front panel USB 2.0 and optional IEEE-1394 ports
- 92 programmable presets; 8 permanent factory installed presets
- NTSC/PAL video or SDI Digital
- DVB-S Modulation
- LMS-T Modulation
- Digital COFDM operation provides:
  - 6 Watts at 2 GHz
  - 2.5 Watts at 7 GHz (QPSK mode)
- High Power Analog FM operation provides 12 Watt output at 2 GHz and 5 Watts at 7 GHz
- Front Panel Display and Keypad for operating parameters and system conditions

Video
- SD/HD-SDI Input
- Composite Baseband
- Analog Video Input
- IF Monitor
- ASI Inputs
- IF Input

Service
- Wayside Serial Port
- Summary Alarms
- ATPC Option
- IP Data Return Link
- 10/100 TCP/IP

Audio
- Analog Audio Channels (4)
- AES/EBU (Embedded Audio)
- AC-3

RF & Antenna Control
- CodeRunner 2™ Compatible
- Dual RF Output
- Antenna Selection
- Antenna Polarization

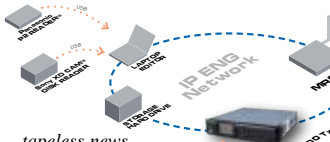
Go Live

while sending edited stories

IP traffic destined for the studio is encapsulated and multiplexed into the same bit stream that carries real time ASI from the internal MPEG SD/HD encoder. In addition, using MRC's single carrier QAM modulator, you can achieve throughput rates approaching 60 Mbps in a 12 MHz BAS channel.

MRC's advanced News Gateway provides IP connectivity over multiple wide area network pathways to support file transfer and remote van management. The News Gateway has full Ethernet router functionality with VPN tunneling and eight Ethernet switch ports. A WiFi connection may also be activated to provide seamless local WLAN connectivity.

MRC News Gateway™
Bi-Directional IP Gateway
- Full featured IP Router
- 900 MHz and 2 GHz DRL Support
- EVDO, GSM and WI-FI interfaces available
- GPS based location services



tapeless news acquisition

MTX5000 can accept SDI, HD-SDI, embedded/de-embedded audio, ASI, composite video, RS-232, and T1 data. Audio input options include AES/EBU, analog, and pre-encoded AC-3.

MTX5000 accepts IP traffic for transmission over the ENG path to the studio using UDP or TCP/IP protocols. An integrated router manages all aspects of IP traffic flow.

MTX5000™
ENG/OB Mobile Transmitter
- The industry's first software defined ENG mobile transmitter
- Future proof platform that is software upgradeable in the field
- Control RF, Encoding and Modulation from the studio for cost effective news gathering
- Works seamlessly with MRC's News Gateway platform

Gather News

from multiple sources

diversity receive

The DRS4000 Diversity Receiver provides enhanced video coverage from airborne, portable, or wireless cameras.

DRS4000™
Digital Diversity Receiver
- Supports up to 6 antennas
- Maximum Ratio Combining for ultra sensitive reception
- Includes ENG optimized LMS-T demodulation
- HD encoding available

At the Central receive site, an MRX4000 Plus receiver demodulates the DVB-T/COFDM signal to the ASI level, so that the combined video and IP traffic may be passed through to the studio. The MRX4000 Plus also provides a local SDI signal and an available HD-SDI output option.

DAR Plus™
High Capacity Digital Radio
- QPSK, 16QAM, 64 QAM Modulation
- Standard & High Power Options
- Models for 2 to 15 GHz Bands

SCM4000™
Single Carrier Modem
- Simultaneously supports ASI channels plus auxiliary data
- Data Rates up 155 Mbps
- Remote Control & Monitoring

MRX4000 Plus™
Integrated Analog/ Digital Receiver
- SD / HD Decoding
- Remote Network Control

Manage & Direct

from studio to remote ENG

IP de-encapsulation

At the studio, several options are available. For HD/SD operation, deploy an SCM4000 demodulator in combination with a DVC4000 SD/HD decoder with integral IP de-encapsulator.

If SD only operation is anticipated, and an SCM4000 demodulator/decoder is already in place, the only addition would be an MRC IPRX de-encapsulator to separate IP traffic from the ASI and make it available through an RJ-45 10/100 interface. The IPRX includes a powerful built-in web browser control system that allows quick and easy set up of all IP parameters.

IPRX™
De-encapsulates IP from ASI Stream
- Network Controlled
- User Friendly Set Up

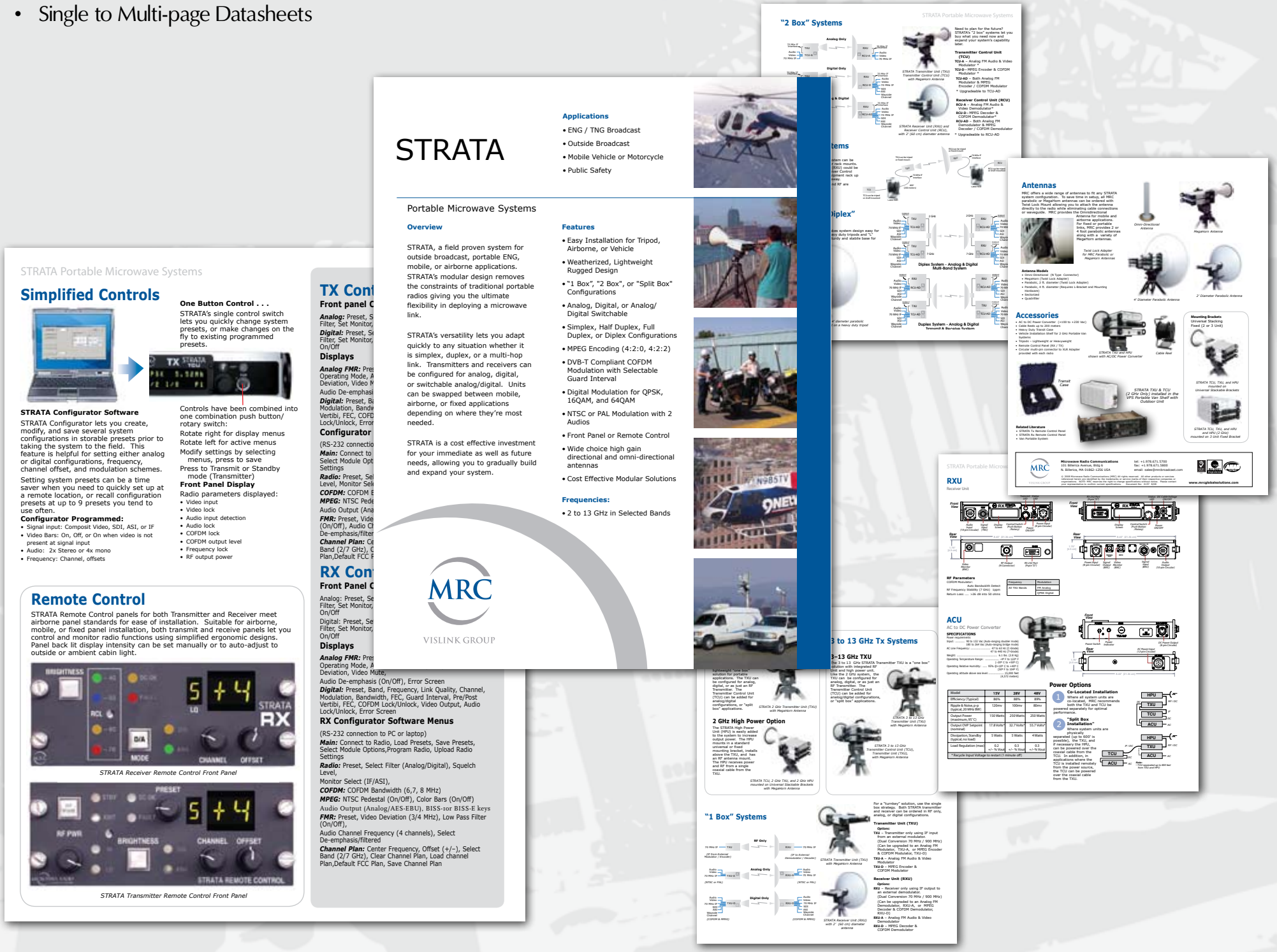
DVC4000™
Dedicated MPEG Decoder
- Optional HD Decoder
- Built-in ASI/IP De-encapsulator

MRC a Vislink company

www.mrcbroadcast.com

- 2 sided poster mailers (22″ x 34″)
  Joined end to end (22″ x68″)

- Single to Multi-page Datasheets



STRATA Portable Microwave Systems

Simplified Controls

One Button Control . . .

STRATA's single control switch lets you quickly change system presets, or make changes on the fly to existing programmed presets.

Controls have been combined into one combination push button/ rotary switch:

Rotate right for display menus

Rotate left for active menus

Modify settings by selecting menus, press to save

Press to Transmit or Standby mode (Transmitter)

Front Panel Display

Radio parameters displayed:

- Video input
- Video lock
- Audio input detection
- Audio lock
- COFDM lock
- COFDM output level
- Frequency lock
- RF output power

STRATA Configurator Software

STRATA Configurator lets you create, modify, and save several system configurations in storable presets prior to taking the system to the field. This feature is helpful for setting either analog or digital configurations, frequency, channel offset, and modulation schemes.

Setting system presets can be a time saver when you need to quickly set up at a remote location, or recall configuration presets at up to 9 presets you tend to use often.

Configurator Programmed:

- Signal input: Composite Video, SDI, ASI, or IF
- Video Bars: On, Off, or On when video is not present at signal input
- Audio: 2x Stereo or 4x mono
- Frequency: Channel, offsets

Remote Control

STRATA Remote Control panels for both Transmitter and Receiver meet airborne panel standards for ease of installation. Suitable for airborne, mobile, or fixed panel installation, both transmit and receive panels let you control and monitor radio functions using simplified ergonomic designs. Panel back lit display intensity can be set manually or to auto-adjust to outside or ambient cabin light.

STRATA Receiver Remote Control Front Panel

STRATA Transmitter Remote Control Front Panel

TX Cont

Front panel C

Analog: Preset, S
Filter, Set Monitor,

Digital: Preset, S
Filter, Set Monitor,
On/Off

Displays

Analog FMR: Pres
Operating Mode, A
Deviation, Video M

Audio De-emphasi

Digital: Preset, Ba
Modulation, Bandw
Vertibi, FEC, COFD
Lock/Unlock, Error

Configurator

(RS-232 connectio

Main: Connect to
Select Module Opt
Settings

Radio: Preset, Sel
Level, Monitor Sele

COFDM: COFDM B

MPEG: NTSC Pede

Audio Output (Ana

FMR: Preset, Vide
(On/Off), Audio Cl
De-emphasis/filter

Channel Plan: Ce
Band (2/7 GHz), C
Plan,Default FCC F

RX Cont

Front Panel C

Analog: Preset, Se
Filter, Set Monitor,
On/Off

Digital: Preset, Se
Filter, Set Monitor,
On/Off

Displays

Analog FMR: Pres
Operating Mode, A
Deviation, Video Mute,

Audio De-emphasis (On/Off), Error Screen

Digital: Preset, Band, Frequency, Link Quality, Channel, Modulation, Bandwidth, FEC, Guard Interval, Pre/Post Vertibi, FEC, COFDM Lock/Unlock, Video Output, Audio Lock/Unlock, Error Screen

RX Configurator Software Menus

(RS-232 connection to PC or laptop)

Main: Connect to Radio, Load Presets, Save Presets, Select Module Options,Program Radio, Upload Radio Settings

Radio: Preset, Select Filter (Analog/Digital), Squelch Level,

Monitor Select (IF/ASI),

COFDM: COFDM Bandwidth (6,7, 8 MHz)

MPEG: NTSC Pedestal (On/Off), Color Bars (On/Off)

Audio Output (Analog/AES-EBU), BISS-1or BISS-E keys

FMR: Preset, Video Deviation (3/4 MHz), Low Pass Filter (On/Off),

Audio Channel Frequency (4 channels), Select De-emphasis/filtered

Channel Plan: Center Frequency, Offset (+/–), Select Band (2/7 GHz), Clear Channel Plan, Load channel Plan,Default FCC Plan, Save Channel Plan

STRATA

Applications

- ENG / TNG Broadcast
- Outside Broadcast
- Mobile Vehicle or Motorcycle
- Public Safety

Portable Microwave Systems

Overview

STRATA, a field proven system for outside broadcast, portable ENG, mobile, or airborne applications. STRATA's modular design removes the constraints of traditional portable radios giving you the ultimate flexibility in deploying a microwave link.

STRATA's versatility lets you adapt quickly to any situation whether it is simplex, duplex, or a multi-hop link. Transmitters and receivers can be configured for analog, digital, or switchable analog/digital. Units can be swapped between mobile, airborne, or fixed applications depending on where they're most needed.

STRATA is a cost effective investment for your immediate as well as future needs, allowing you to gradually build and expand your system.

Features

- Easy Installation for Tripod, Airborne, or Vehicle
- Weatherized, Lightweight Rugged Design
- "1 Box", "2 Box", or "Split Box" Configurations
- Analog, Digital, or Analog/ Digital Switchable
- Simplex, Half Duplex, Full Duplex, or Diplex Configurations
- MPEG Encoding (4:2:0, 4:2:2)
- DVB-T Compliant COFDM Modulation with Selectable Guard Interval
- Digital Modulation for QPSK, 16QAM, and 64QAM
- NTSC or PAL Modulation with 2 Audios
- Front Panel or Remote Control
- Wide choice high gain directional and omni-directional antennas
- Cost Effective Modular Solutions

Frequencies:

- 2 to 13 GHz in Selected Bands

MRC

VISLINK GROUP

"2 Box" Systems

"Diplex"

Antennas

Accessories

RXU

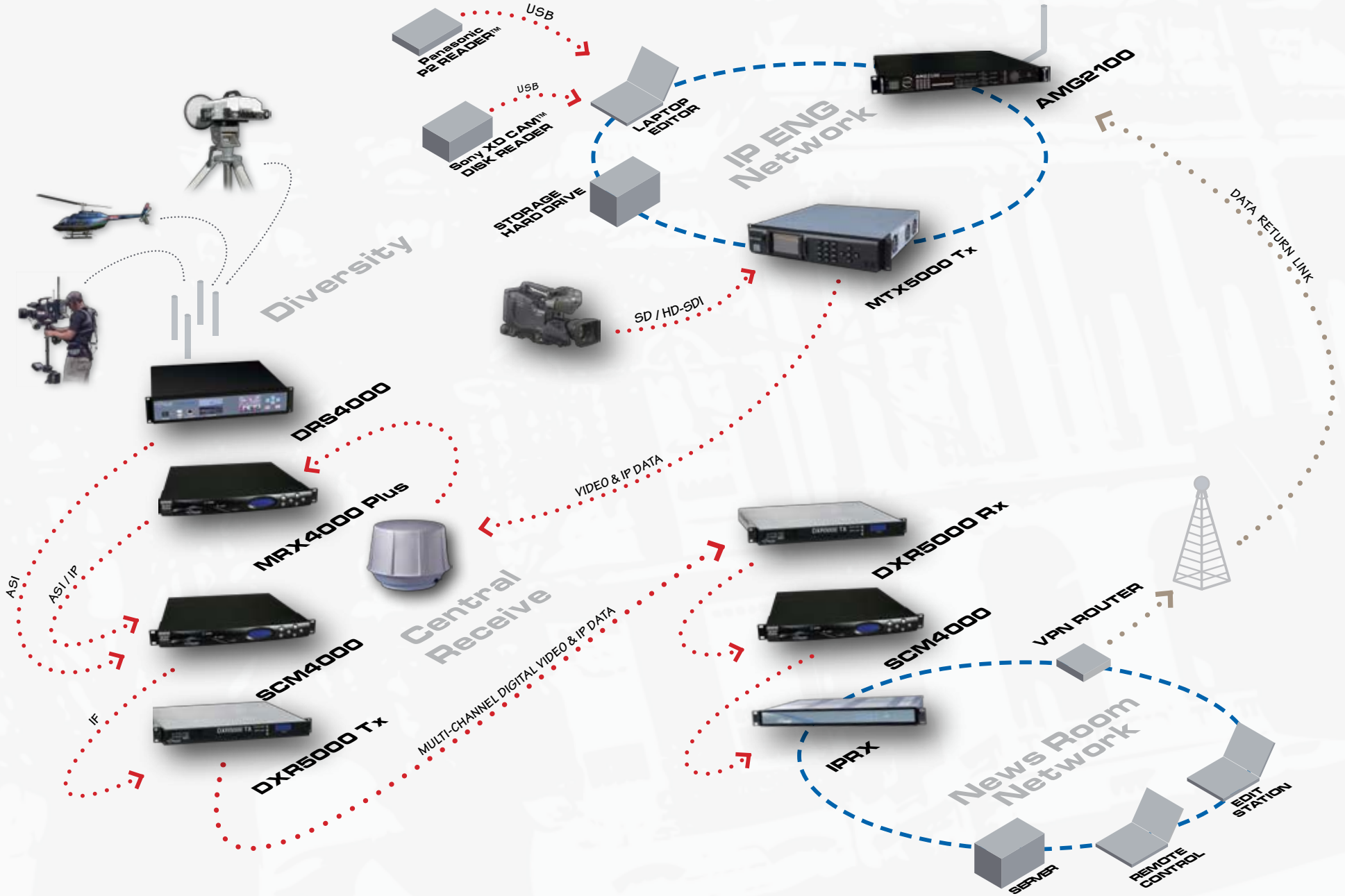
ACU

3 to 13 GHz Tx Systems

"1 Box" Systems

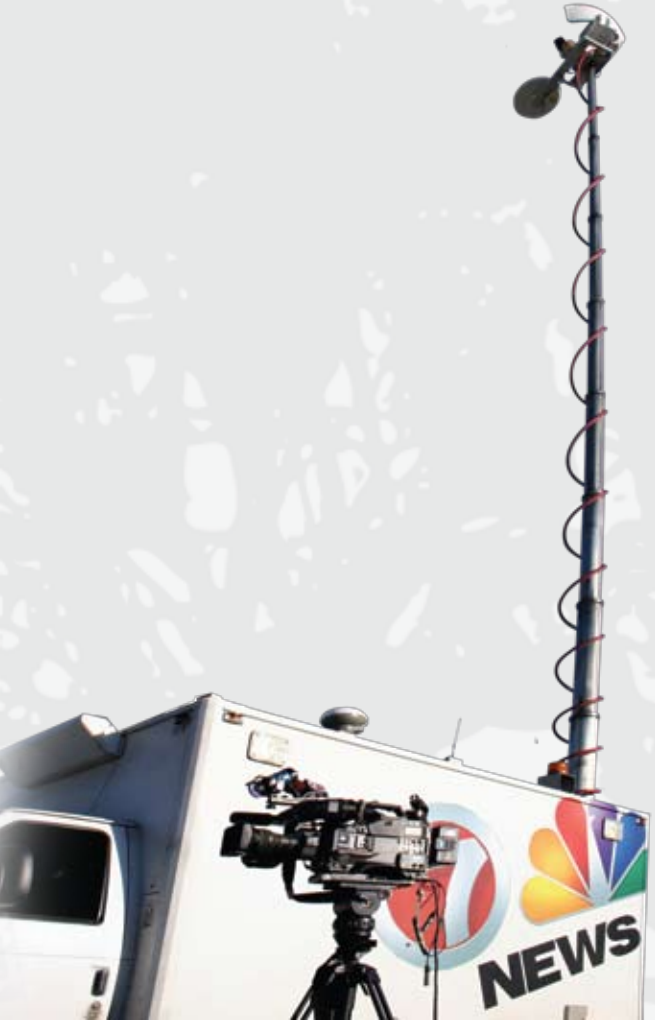
Power Options

- Concept drawing using bit map and vector art



- Field photographs for LINK Research at 2006 All Star Game

- Inside & outside product photography



STRATA

MICROWAVE RADIO COMMUNICATIONS

TRANSMITTER
OPERATOR'S GUIDE

1 Introduction
2 Installation
3 Powering the STRATA Transmitter
4 Front Panel Controls
5 STRATA Tx Configurator
6 Audio & Video Connections

A Error Codes
B Channel & Fequencies

No. 400xxx
Firmware : 1.011
2/6/04

- Operator's Manual

- Pocket Look Up Guides

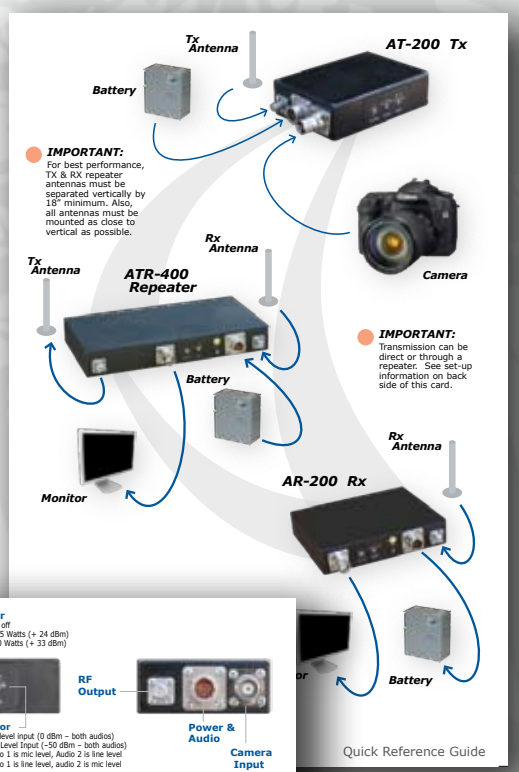


Figure 1-6 Remote Control Panels

2.5.1 STRATA TX Aircraft Remote Control Panel

Controls
- 2 Preset Selections (Analog and Digital)
- Transmit/Standby modes
- HI or Low power output mode
- Channel and Offset

Displays
- Channel and Offset
- Presets (Analog and Digital)

Figure 1-7 Aircraft Remote Control Panels

additional information, see the following technical manuals:
STRATA TX Remote Control Panel Operator's Guide (400489)
STRATA TX Aircraft Remote Control Panel Operator's Guide (400490)

front panel control switch to existing system presets. However, most changes can only be made using the "*STRATA Tx Configurator," Section 5 on page 5-1.*

Figure 1-5 Front Panel Control Switch

For more information, refer to "*Front Panel Controls," Section 4 on page 4-1.*

1.5 Remote Control Operation

For portable, mobile, or airborne installations, two remote control panels are available:
- STRATA TX Standard Remote Control Panel (*Figure 1-6*) – Features 10 selectable presets. For creating presets, see "*STRATA Tx Configurator," Section 5 on page 5-1.*
- STRATA TX Aircraft Remote Control Panel (*Figure 1-7*) – Simplified version of the standard model featuring 2 presets for ease of operation.

Both models feature auto or manual display intensity controls.

2.5.0.1 STRATA TX Remote Control Panel (*Figure 1-6*)

Controls
- 10 Preset Selections
- Transmit/Standby mode
- HI or Low power output mode

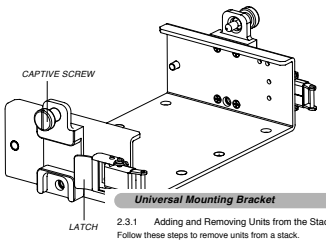
2.3 Universal Mounting Bracket

The Universal Mounting Bracket (U-Bracket) lets you install multiple units as shown in *Figure 2-4*. Individual units are mounted to a single bracket using a set of latches (*Figure 2-5*). Brackets can be added and removed from a stack of units using the two captive screws on either side of the bracket. In addition, units can be removed from their brackets without removing it form the stack.

Note: *Due to the added height of the High Power Unit, it must always be installed at the top of the stack of units.*

Figure 2-4 3 Unit Stack using Universal Brackets

Figure 2-5 Universal Mounting Brackets



2.3.1 Adding and Removing Units from the Stack

Follow these steps to remove units from a stack.

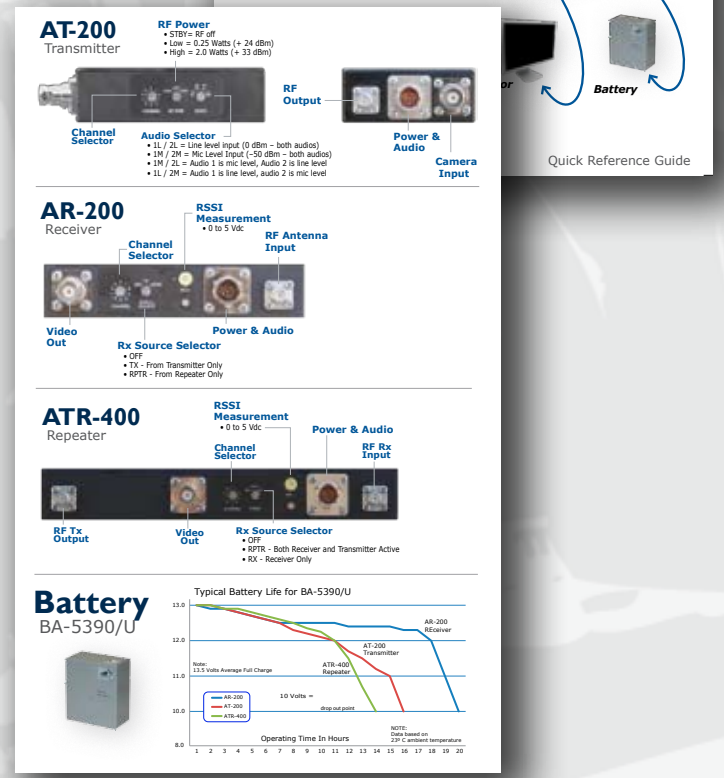
Step 1 Loosen the captive screws on both sides of the unit as shown in *Figure 2-6*.

Figure 2-6 Captive Screws on Universal Bracket

Step 2 Once the captive screws are loosened, lift the unit from the stack as shown in *Figure 2-7*.

Figure 2-7 Removing Unit from Stack with Universal Bracket

Step 3 To install the bracket, reverse these steps.



- Web Product CD

- Corporate Style Web Site