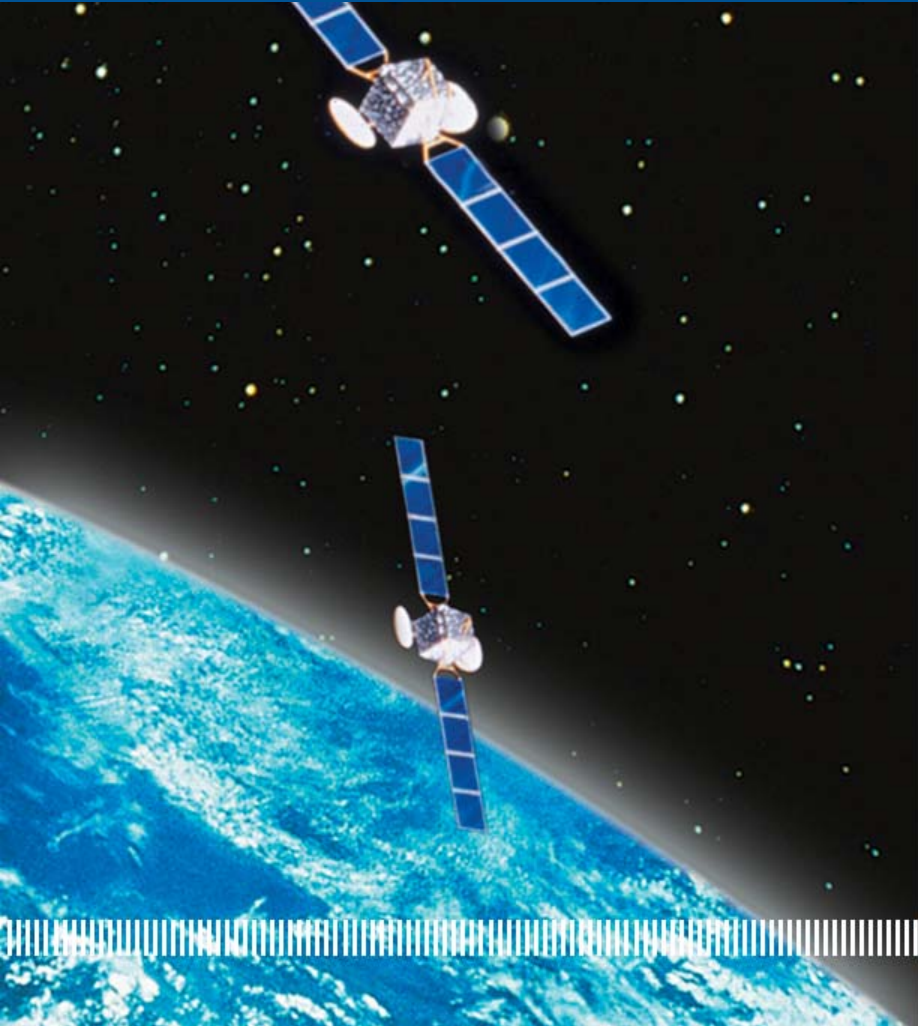


# VIDEO COMPRESSION SOLUTIONS



## Broadcast Products Update

**May 2009**

**Damon Semprebon**  
**V.P. Product Management &  
Business Development**  
**Comtech Tiernan Video Inc.**



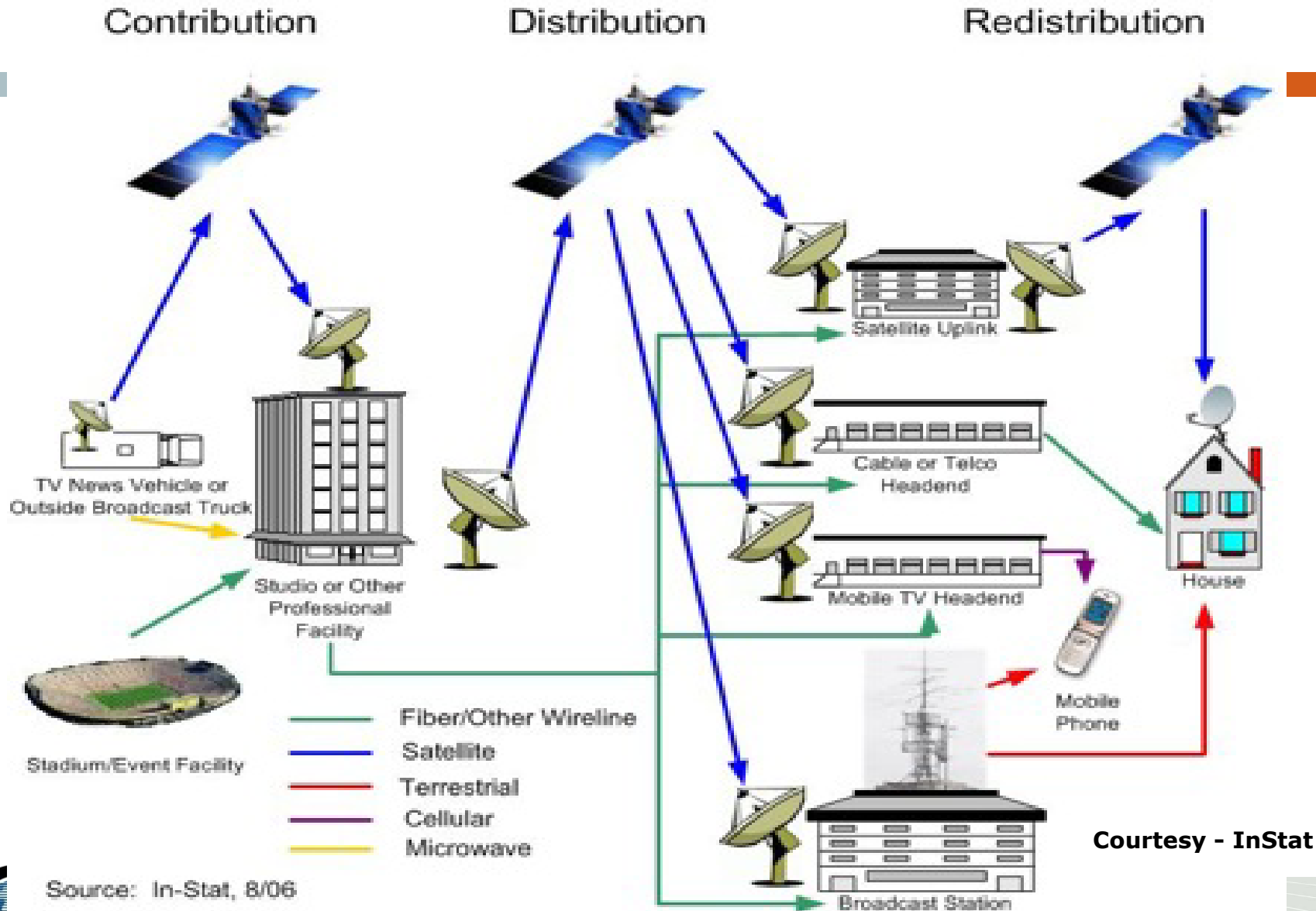
# ComtechTV History

- Born in 1993 as Tiernan
  - Tiernan Communications
- Purchased in 2002 by Radyne
  - Tiernan, A radyne Comstream Company
  - Tiernan, A Radyne Company
- Purchased in 2008 by Comtech
- Now Comtech Tiernan Video Inc
  
- ComtechTV
  - Focused on Live Event coverage via Satellite

# The “S” in ISOG

- Dishes on the roof in San Diego
  - Steerable 3.8’s, 2.4’s and 1.8.
- Satellite interfaces available in every unit
  - Modulators
    - DVB-S / DVB-DSNG (QPSK, 8PSK, 16QAM)
    - DVB-S2 (QPSK, 8PSK, 16APSK)
    - 70/140 & L-band
  - Demodulators
    - Complementary
  - Every unit designed and built with the intention of “going mobile”
    - Rugged, Robust, Reliable
    - Simple to operate & use

# Live Event Video Landscape



Courtesy - InStat

Source: In-Stat, 8/06

# Video Landscape ComtechTV

## Live event Contribution



Mobile Contribution  
News, Sports, etc.

Professional Distribution

# U.S. MPEG-4 HD Live Events

- Breaking News (35%)
  - Primarily SD MPEG-2 4:2:0 today
  - Desire to do **HD in SD BW** (4 – 6 mhz)
  - Solution = HD MPEG-4 4:2:0 & DVB-S2
- Scheduled News / Regional Sports (50%)
  - Primarily HD MPEG-2 4:2:0 today (full transponder)
  - Desire to **save cost** / BW (1/2 – 1/4 transponder)
  - Solution = HD MPEG-4 4:2:0 & DVB-S2
- National Sports (15%)
  - Some HD MPEG-2 4:2:2 today (mostly 4:2:0)
  - Desire for **Higher Quality** ( 3D and digital cinema)
  - Solution HD MPEG-4 4:2:2 & DVB-S2



# Mobile Contribution



# Latency

- Latency matters in Contribution
- However...
- Most users trade lower latency for higher video quality
- The ComtechTV Approach –
  - Simple easy to use : Dial up the delay
  - 300ms, 600ms, 1 Second, 1.6 seconds



# History of Tiernan 4:2:2

- 1996 Tiernan delivers 4:2:2 SD for contribution – before DVB specification is completed.
- 1997 Specification completed – with a few changes.
- 1998 – Tiernan delivers THE1 – 4:2:2 HD encoder
- 2004 – First customer actually uses Tiernan 4:2:2 for HD contribution
- 2009 – On a recent weekend, only 4 of 23 MPEG-2 HD sports broadcasts monitored were in 4:2:2
  
- ***Today – MPEG-4 support 4:2:0 only***

# ComtechTV Products Overview

- Product line includes Video Encoders, Decoders, IRD's, network adapters
  - Support for MPEG-2 & MPEG-4
  - High & Standard Definition services
  - Encoders offer internal Modulators – DVB-S & DVB-S2
  - IP interfaces available
  - Always Built to Travel

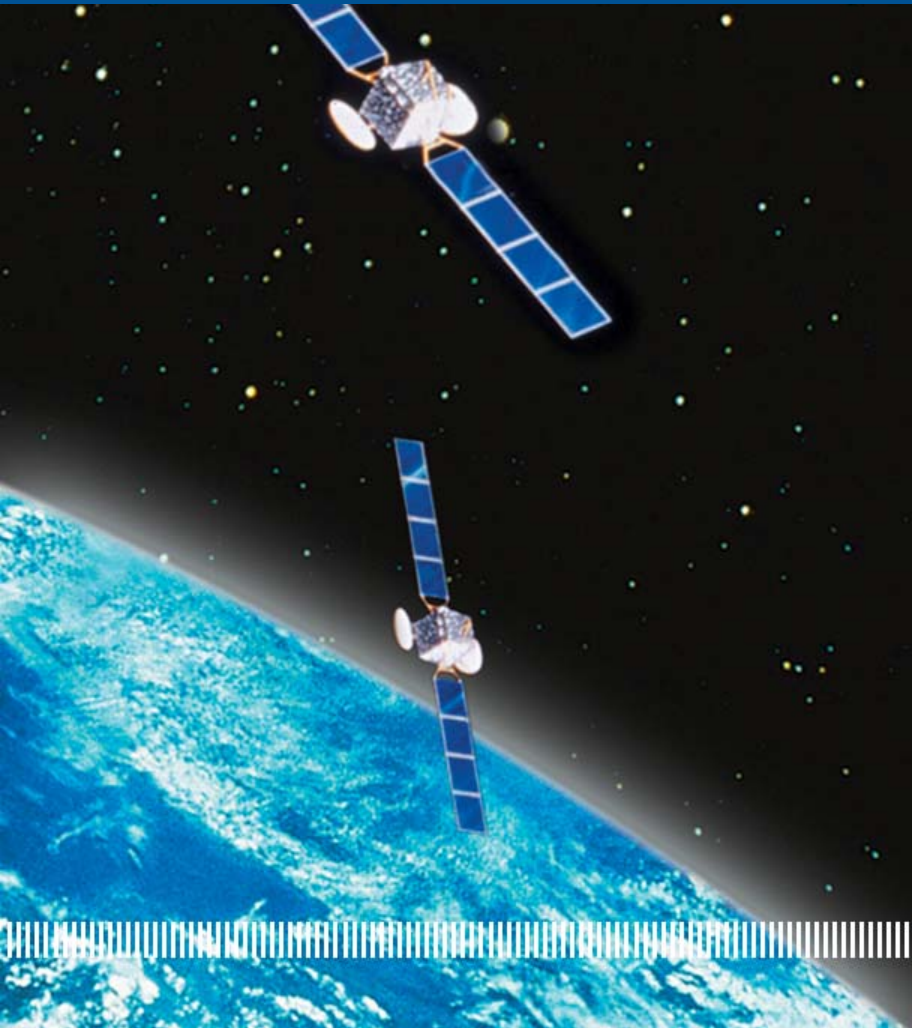


Encoders



Decoders

# VIDEO COMPRESSION SOLUTIONS



## AVC4000HD Encoder



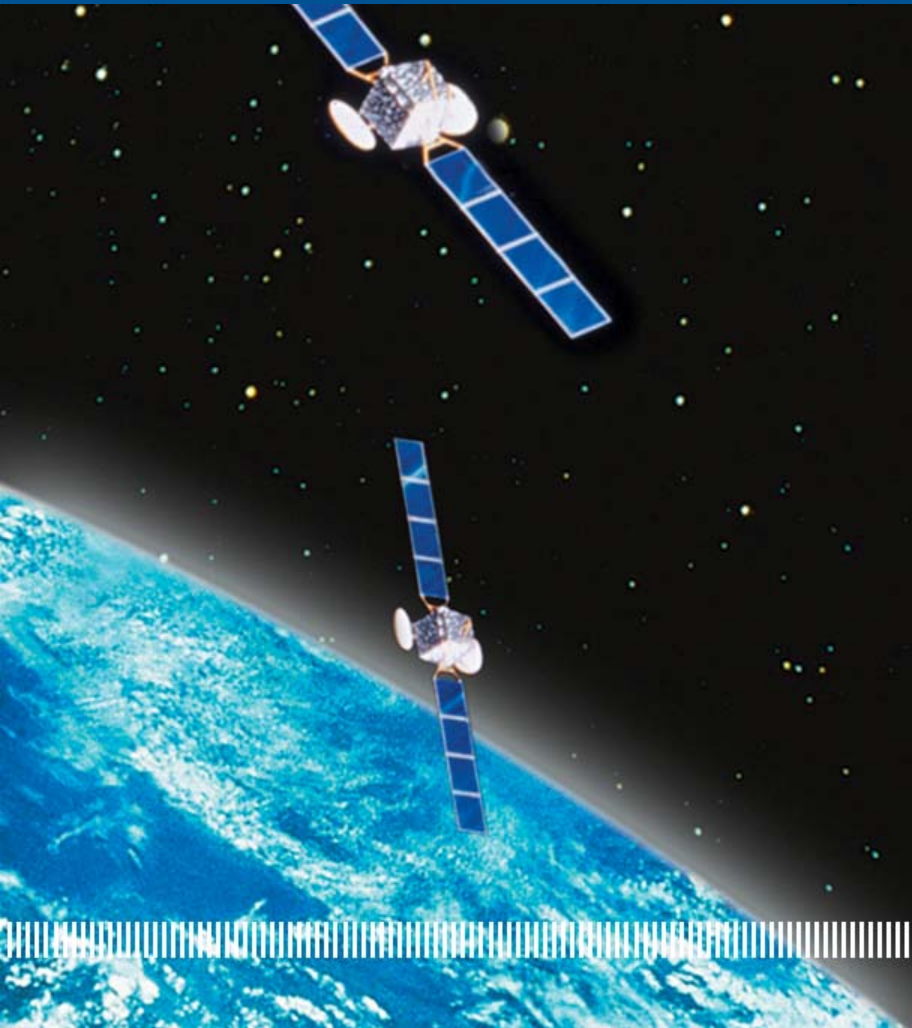
# AVC4000HD Encoder

- Designed for simple MPEG-2 SD DVB-S to MPEG-4 HD DVB-S2 Upgrade
- MPEG-2 SD for continuity of operations & MPEG-4 HD 4:2:0
- Internal Modulator Option
  - DVB-S QPSK, 8PSK, 16QAM
  - DVB-S2 QPSK, 8PSK, 16APSK
  - 70 / 140 Mhz & L-band with 10 mhz reference
- Internal IP Interface Option
  - Cop3 with FEC
- Internal Telephony Interface Option
  - DS3 or E3
- Full Front Panel Control, Web Browser Control, SNMP

# Other Encoder Models

- SE2000
  - Low Cost MPEG-2 SD
- SE4000
  - High Flexibility MPEG-2 SD
- HE4000SD
  - MPEG-2 SD upgradeable to MPEG-4 or HD
- HE1000
  - Low Cost MPEG-2 HD
- HE4000
  - Fully Featured MPEG-2 HD & SD
- AVC4000SD
  - MPEG-4 & MPEG-2 SD
- AVC4000HD
  - MPEG-4 HD & MPEG-2 SD

# VIDEO COMPRESSION SOLUTIONS



## HMR5440 Decoder





# HMR5440 Decoder

- Designed for simple upgrade and backwards compatibility
- MPEG-2 & MPEG-4, HD & SD,
- Up, down, cross conversion functions
  
- Internal Demodulator Option
  - DVB-S QPSK, 8PSK, 16QAM
  - DVB-S2 QPSK, 8PSK, 16APSK
- Internal IP Interface Option
  - Cop3 with FEC
- Internal Telephony Interface Option
  - DS3 or E3
- Full Front Panel Control, Web Browser Control, SNMP

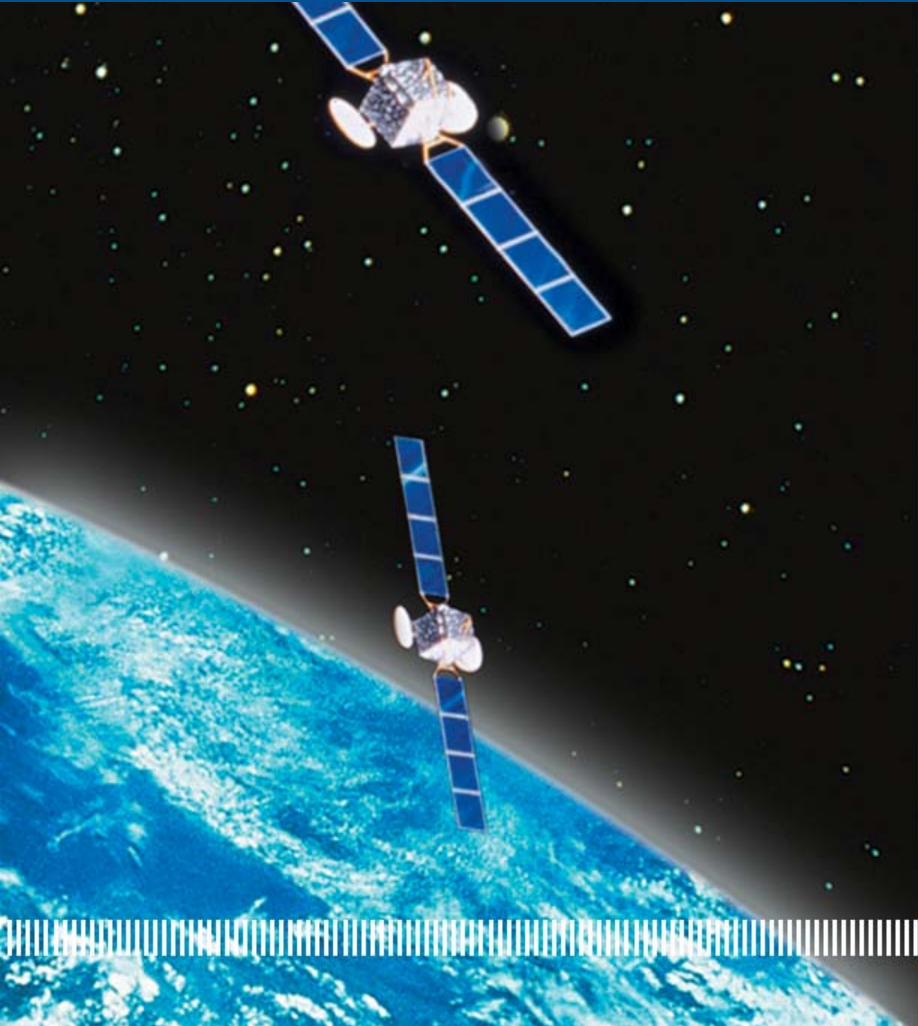
# Decoder Models

- **TDR1000 / TDR3000**
  - Low Cost MPEG-2 SD 4:2:0
- **TDR4000**
  - High Flexibility MPEG-2 SD 4:2:0
- **TDR4022**
  - MPEG-2 SD 4:2:2 & 4:2:0
- **TDR4400**
  - HD or SD MPEG-2 & MPEG-4
- **HD4040**
  - MPEG-2 SD & HD 4:2:2 or 4:2:0
- **HMR5440**
  - HD or SD, MPEG-4 & MPEG-2

# What's next?

- Comtech brings advanced Satellite modulation and control capabilities to comtechTV
  - Carrier – in Carrier = Bandwidth Savings
  - Skywire – Vipersat = Bandwidth on demand
  - Auto-Eq – full transponder performance improvement
  - Digicast / Memotec – IP acceleration
  - Stay tuned!

# VIDEO COMPRESSION SOLUTIONS



**Thanks for the time**

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