

# ***ROSS***<sup>®</sup>

***LIVING LIVE!***

***ROSS***

Production Technology Experts

Copyright Ross Video - All Rights Reserved

# Scott Barber

 PixelPower

International Sales  
Manager



Graphics Producer



Sales Manager, UK  
Sales Director, India



Project Manager

  
LIVING LIVE!







# Corporate Origins and Ownership



In 1974 John Ross sold his airplane to start the company in the basement of his home in Montreal

There has never been any (other) venture capital

Now 90% owned by his son, CEO David Ross

Ross staff own the rest





**100+**  
COUNTRIES EVERY YEAR

## ACQUISITIONS IN 10 YEARS

**14**



- 1) Media Refinery - Graphics
- 2) Norpak - Data and Ratings Insertion
- 3) Codan Broadcast - Routers
- 4) FX Motion - Robotic Cameras
- 5) Cambotics - Robotic Cameras
- 6) Montalto - Routers
- 7) MCP - Mobile Production Services
- 8) ADS - News Room Computers
- 9) Unreel - Virtual Set Technology
- 10) Rocket Surgery - Creative Services
- 11) Coveloz - IP Technology
- 12) Abekas - Video Servers & Replay
- 13) Portalis - Workstation Integrator
- 14) Piero - Sports Graphics Analysis

**27 Years**  
Consecutive  
Growth



**LIVE PRODUCTION**  
Technology & Services



**700+**  
EMPLOYEES

**70,000** Sq.ft

**MANUFACTURING  
FACILITY**



**13**  
GLOBAL  
OFFICE  
LOCATIONS

Ottawa  
Iroquois  
London  
Singapore  
Virginia  
Kanata  
Sunnyvale  
Sydney  
Fort Lauderdale  
Beijing  
Reading  
Melbourne  
Salt Lake City

**\$ TOP**  
Rated\*

- Value For Money
- Great Customer Service

**6**

**PRODUCTION  
TRUCKS**



## PRODUCT & SERVICE CATEGORIES

**24**

Graphics, Camera Robotics, Production Switchers, Signal Processing, Routers, Master Control, Automated Production, Facility Control, Virtual & Augmented Reality, Creative Services, Mobile Production Services, Cameras, Video Servers, Replay Systems, Media Asset Management, News Room Editorial Systems, Social Media Media Management, Venue Signage System, MultiViewers, Media IP Technology, LED Video Processors, Studio-In-A-Box, Workstation Integration, Sports Analysis

Top 3 Ross Video Word Associations\*

**Innovative Value Great**

\*Source: Devoncroft Big Broadcast Survey

# XPression

MOTION GRAPHICS

## PIERO



CREATIVE SERVICES  
ROCKET SURGERY | Graphics Creation



STUDIO IN A BOX  
GRAPHITE



OPENTRUCK

OPENTRUCK | Flight Case through 40-foot Truck Designs



PRODUCTION SERVICES

**mobile**  
productions



MULTI-SCREEN IMAGE  
PROCESSING  
CARBONITE MOSAIC



ASSET MANAGEMENT

**streamline.cloud**



CAMERAS



CHROMA KEYING  
ULTRACHROME HR



\* Carbonite Black Chassis with UltraChrome HR Software.

NEWS & SOCIAL MEDIA

**inception.cloud**



CONTROL SYSTEMS

**overdrive**

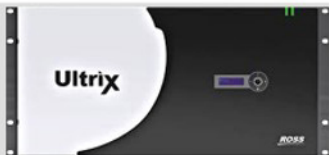


PRODUCTION SWITCHERS

**CARBONITE BLACK**  
A · C · U · I · T · Y



Ultrix



INFRASTRUCTURE



IP TECHNOLOGY

OEM PRODUCTS | Market Ready Modules & System-on-Chip



VIDEO SERVERS, REPLAY & DELAY

**Abekas**



ROBOTICS



VIRTUAL & AUGMENTED REALITY



**VOYAGER**



# Code of Ethics

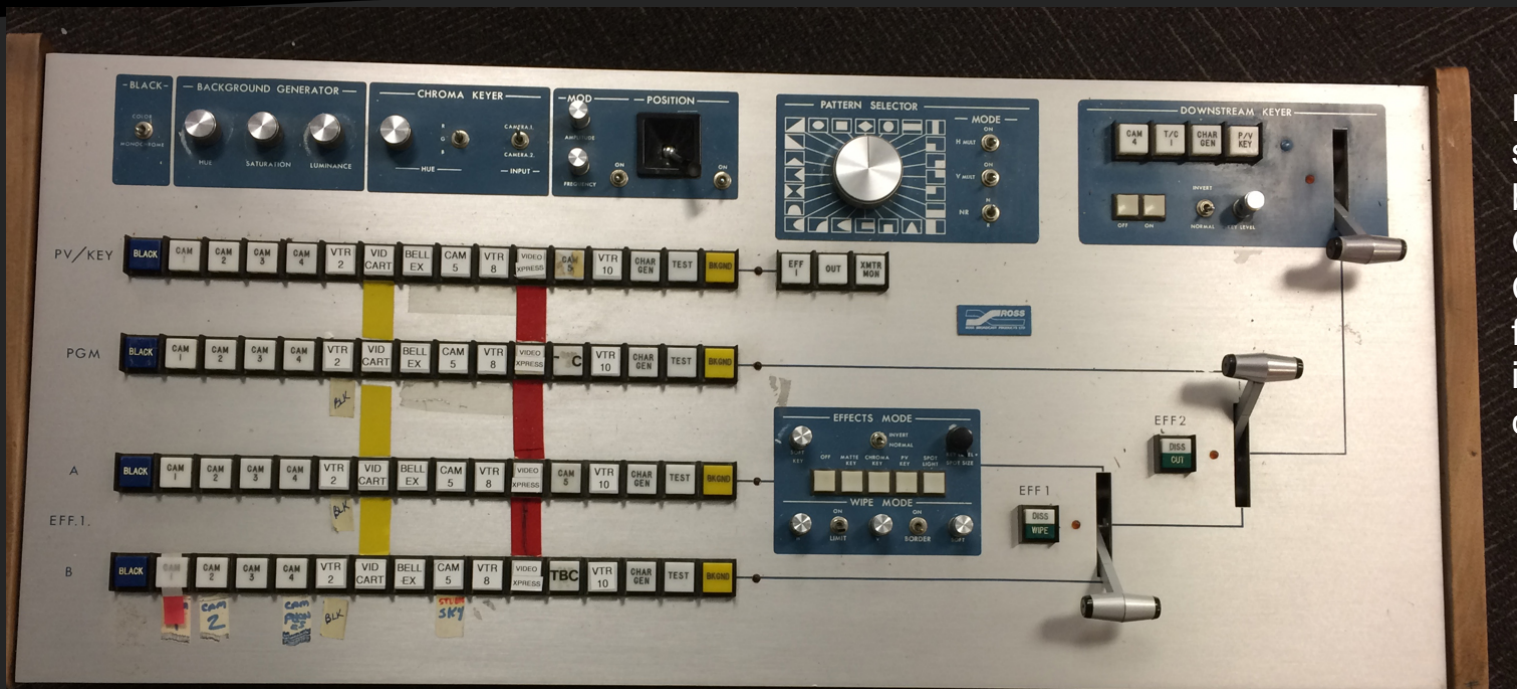
1. We will always act in our customer's best interest.
2. We will do our best to understand our customer's requirements.
3. We will not ship crap.
4. We will be great to work with.
5. We will do something extra for our customers, as an apology, when something big goes wrong and it's our fault.
6. We will keep our promises.
7. We will treat the competition with respect.
8. We will cooperate with and help other friendly companies.
9. We will go above and beyond in times of crisis. *If there's no one to authorize the required action in times of company or customer crisis - do what you know in your heart is right. (You may rent helicopters if necessary.)*





**XPression**

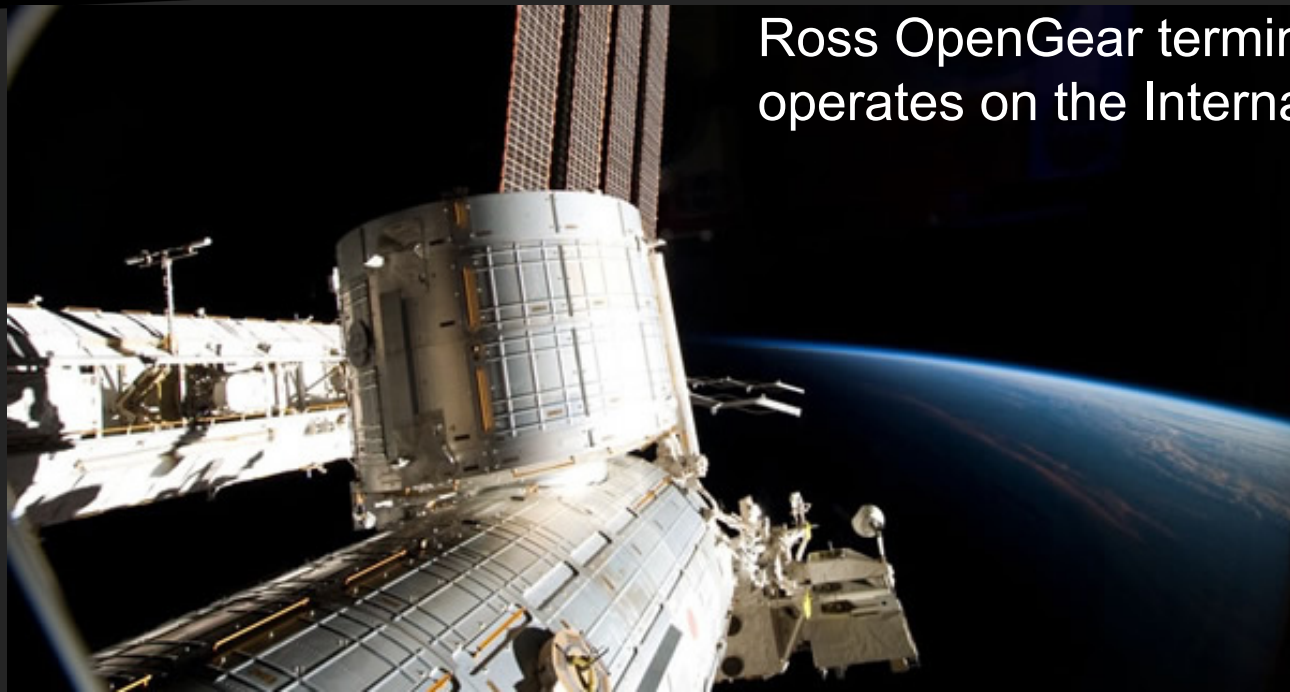
# Some things you may not know...



Production Switcher serial no. 002 was bought from new by CBC-affiliate Station CKOS in 1974, and finally decommissioned in 2015 after 41 years continuous use.



# Some things you may not know...



Ross OpenGear terminal equipment currently operates on the International Space Station



# XPression

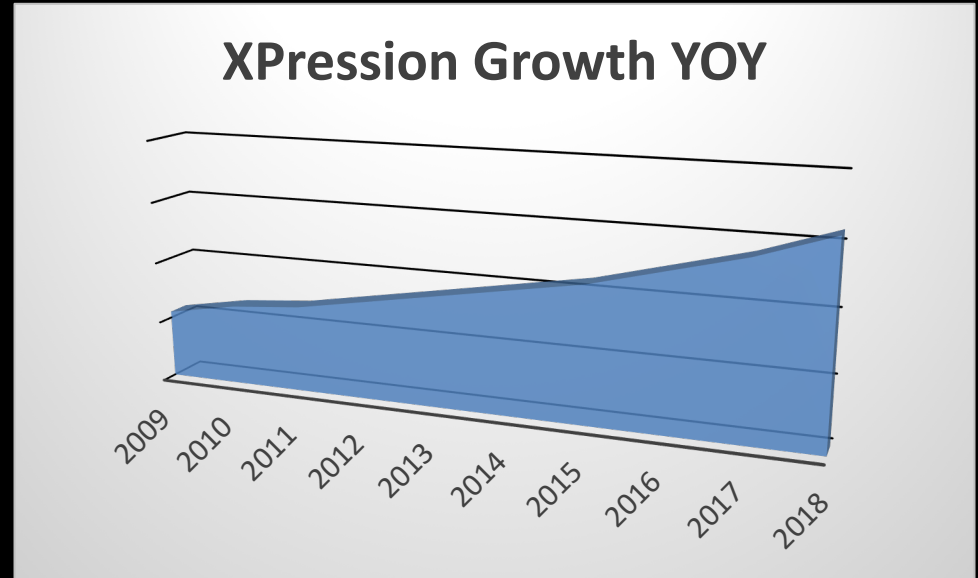


**Ross Video purchased Netherlands based Media Refinery in 2009 from Bas Saleh, who also joined Ross as a Director.**



# Where Are We Today?

- Annual growth at 10% or more for the past 10 years
- Over 7,000 unique XPression customers worldwide
- Over 10,000 XPression hardware units shipped worldwide



XPression

# Where Are We Today?



XPression

# Latest Network & Station Groups (USA)



***Turner***



**CBS** Interactive

the **LATE**  
SHOW with  
stephen  
colbert



**NBC Owned  
Television Stations**



XPression

# Piero

PIERO



# The Halo – Mercedes-Benz Stadium in Atlanta

- The HALO is over 1,000 feet long, and 55 feet high.
- It's a 360-degree, 62,000 square-foot circular video board, 21,000 pixels wide





# The Halo – Mercedes-Benz Stadium in Atlanta

- 12 channels of XPression are synchronized together to provide singular coverage of the “Halo” video board
- Designed to offer enhanced IP video routing and connectivity, using SMPTE 2022-6

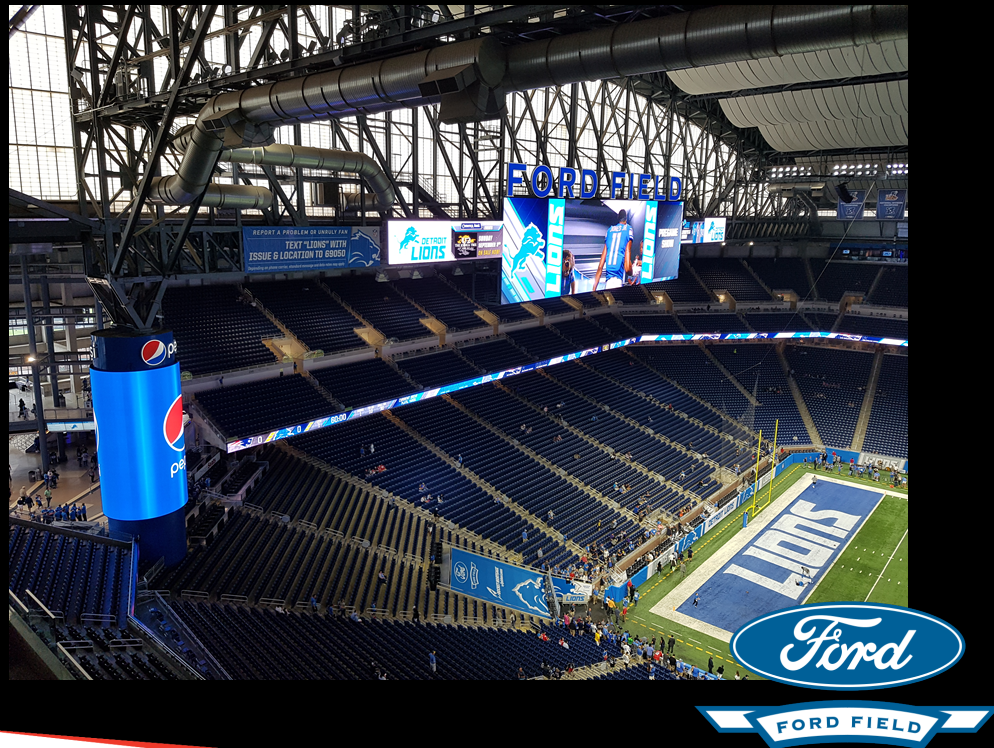




# The Halo – Mercedes-Benz Stadium in Atlanta



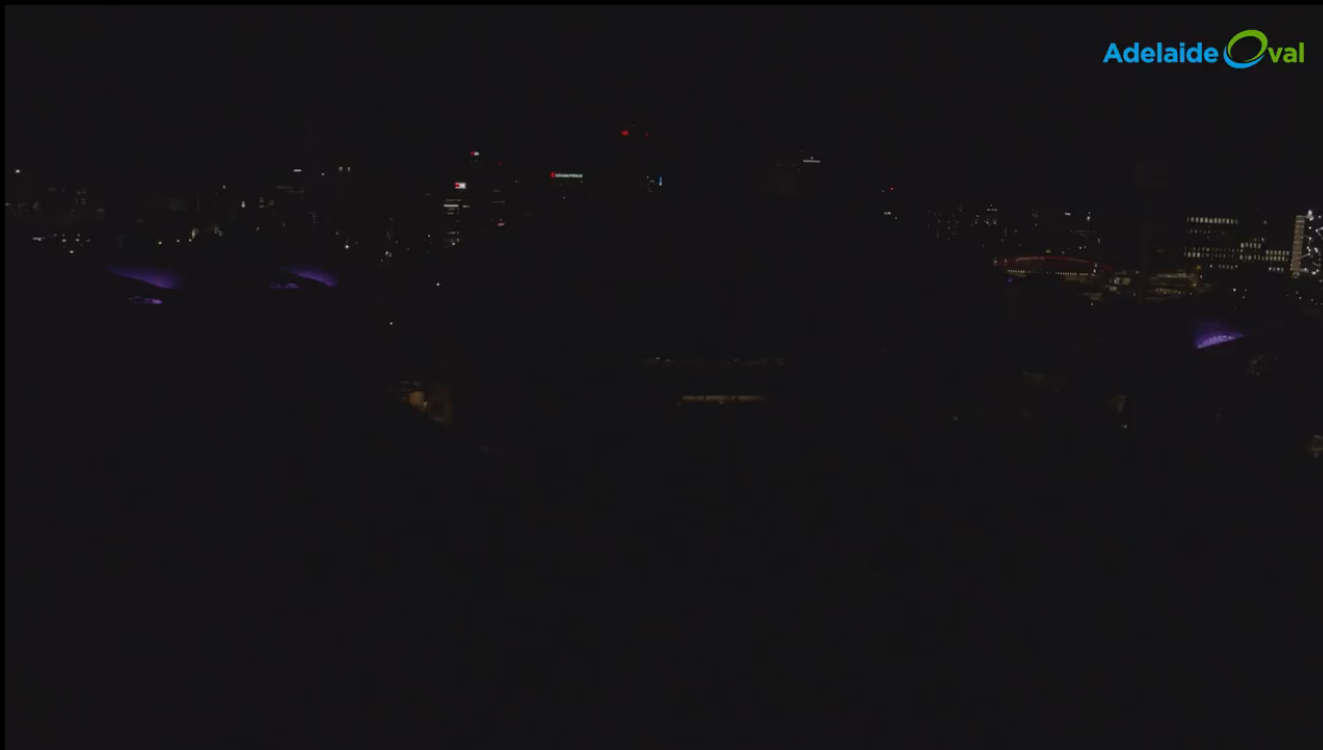
## Ford Field – Detroit Michigan



### Multiple Engines with Tessera

- Three channels for the Main display
- Multiple channels for the ribbon boards wrapping the stadium
- Multiple channels wrapping the “Pepsi can” display

# Adelaide Oval Stadium



Adelaide Oval

XPression

# Football Clubs





# Tottenham Hotspur Stadium





# Lost In Time



# The Weather Channel





# Augmented Reality

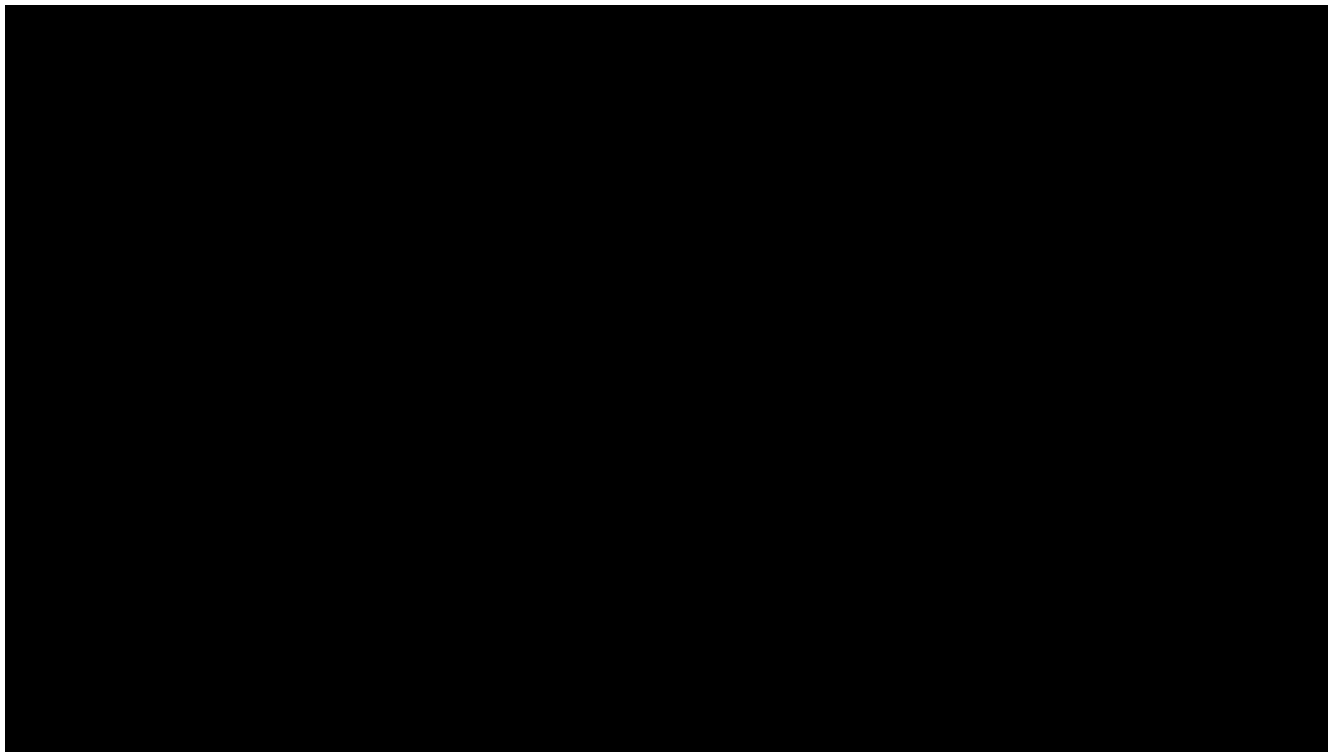




# 3D Scanned Models

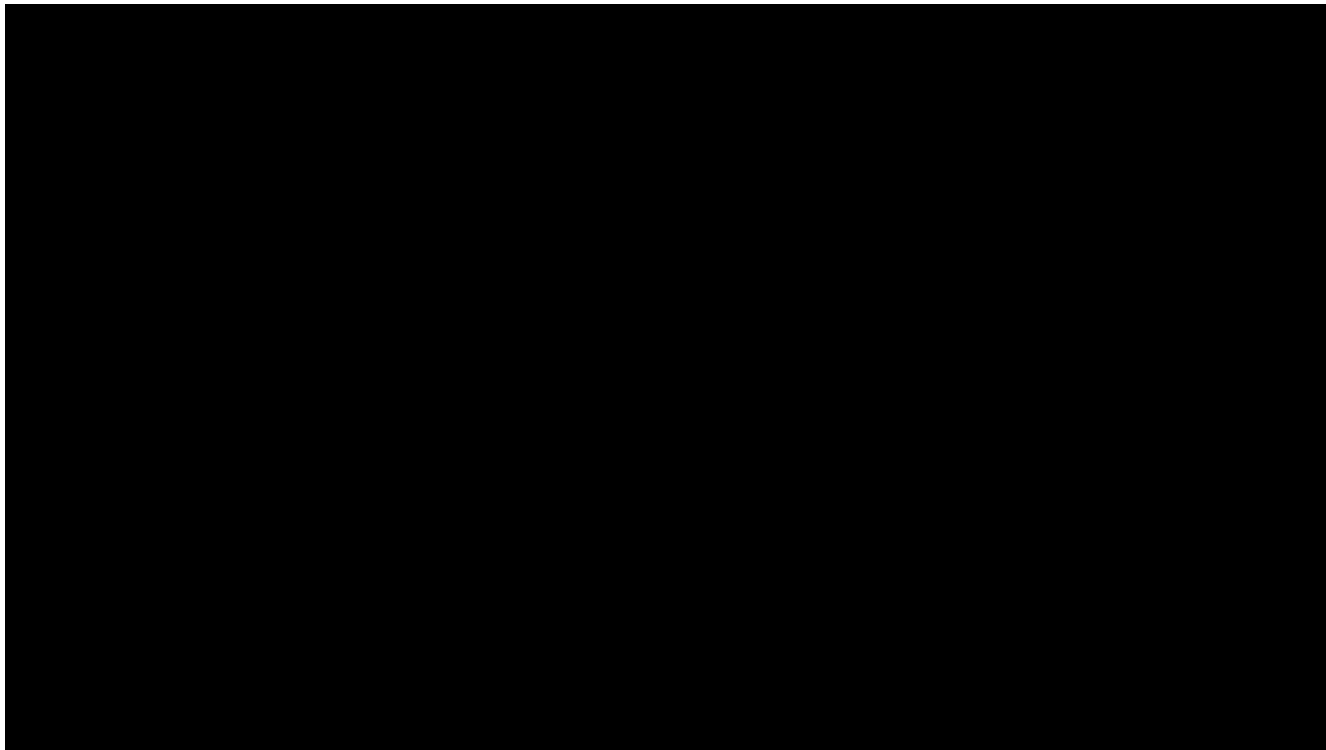
XPression

# Augmented Reality



XPression

# Rocket Surgery



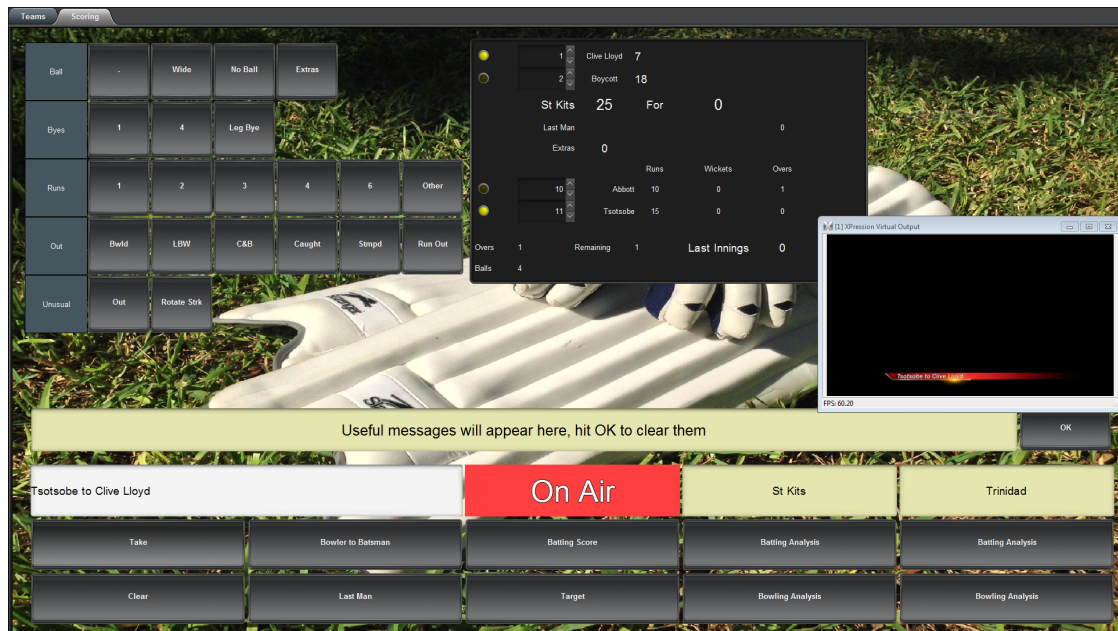
XPression

# Dashboard



The DashBoard Control and Monitoring System is a free application, designed for remote control and monitoring of the open architecture, openGear® platform.





- Designed with TCP/IP connectivity and based on Java.
- The only application that allows complete native control to multiple vendors.
- Ability to add feature plug-ins allowing end-users to customize their applications.



XPression

# Dashboard – Real Madrid

Real Madrid Control Release 3.63.grid

Hardware Setup Match Setup Match Graphics

Match Content Root: D:\Projects\Real Madrid\Images\Match Content\

Match XML File: Match Info Template Movies.xml

Match Date: 16-08-2016 Match Name: Test Match 2 League: Liga+Copa

Reload Only

Reload & Reset Will overwrite any game play changes

Real Madrid C. F.

Real Madrid

GFX No.	GFX Home Picture	Squad	Pos.	Yello.
KROOS	D:\Projects\Real Madrid\Images\Match Co.	8	1	
DANILO	D:\Projects\Real Madrid\Images\Match Co.	23	2	
SERGIO	D:\Projects\Real Madrid\Images\Match Co.	4	3	
MARCELO	D:\Projects\Real Madrid\Images\Match Co.	12	4	
NACHO	D:\Projects\Real Madrid\Images\Match Co.	6	5	
KIKO C.	D:\Projects\Real Madrid\Images\Match Co.	13	6	1 0
SALE	D:\Projects\Real Madrid\Images\Match Co.	11	7	
ISCO	D:\Projects\Real Madrid\Images\Match Co.	22	8	
NAVAS	D:\Projects\Real Madrid\Images\Match Co.	1	9	
CASEMI	D:\Projects\Real Madrid\Images\Match Co.	14	10	
R. YÁÑEZ	D:\Projects\Real Madrid\Images\Match Co.	31	11	
MODRIC	D:\Projects\Real Madrid\Images\Match Co.	19	12	
JAMES	D:\Projects\Real Madrid\Images\Match Co.	10	13	
PEPE	D:\Projects\Real Madrid\Images\Match Co.	3	14	
VARANE	D:\Projects\Real Madrid\Images\Match Co.	5	15	
F. COE	D:\Projects\Real Madrid\Images\Match Co.	15	16	
CARVAL	D:\Projects\Real Madrid\Images\Match Co.	2	17	
KOVÁČČ	D:\Projects\Real Madrid\Images\Match Co.	16	18	
Player 19	D:\Projects\Real Madrid\Images\Match Co.	32	19	
Player 20	D:\Projects\Real Madrid\Images\Match Co.	33	20	
Player 21	D:\Projects\Real Madrid\Images\Match Co.	34	21	
Player 22	D:\Projects\Real Madrid\Images\Match Co.	35	22	
Player 23	D:\Projects\Real Madrid\Images\Match Co.	36	23	
Player 24	D:\Projects\Real Madrid\Images\Match Co.	37	24	

Coach Zidane Zidane t\rm headshots\00 zidane avi 0

Coach Away Team Coach t\rm headshots\01 Benzema png 0

File Errors

Stade de Reims FC

Stade de Reims

GFX No.	GFX Away Picture	Squad	Pos.	Yello.
Really Lo.	D:\Projects\Real Madrid\Images\Match Co.	21	1	
Name 2	D:\Projects\Real Madrid\Images\Match Co.	13	2	
Name 3	D:\Projects\Real Madrid\Images\Match Co.	22	3	
Name 4	D:\Projects\Real Madrid\Images\Match Co.	1	4	
Name 5	D:\Projects\Real Madrid\Images\Match Co.	3	5	
Name 6	D:\Projects\Real Madrid\Images\Match Co.	2	6	
Name 7	D:\Projects\Real Madrid\Images\Match Co.	4	7	
Name 8	D:\Projects\Real Madrid\Images\Match Co.	5	8	
Name 9	D:\Projects\Real Madrid\Images\Match Co.	31	9	
Name 10	D:\Projects\Real Madrid\Images\Match Co.	20	10	
Name 11	D:\Projects\Real Madrid\Images\Match Co.	15	11	
Name 12	D:\Projects\Real Madrid\Images\Match Co.	12	12	
Name 13	D:\Projects\Real Madrid\Images\Match Co.	9	13	
Name 14	D:\Projects\Real Madrid\Images\Match Co.	18	14	
Name 15	D:\Projects\Real Madrid\Images\Match Co.	25	15	
Name 16	D:\Projects\Real Madrid\Images\Match Co.	32	16	
Name 17	D:\Projects\Real Madrid\Images\Match Co.	33	17	
Name 18	D:\Projects\Real Madrid\Images\Match Co.	34	18	
Name 19	D:\Projects\Real Madrid\Images\Match Co.	35	19	
Name 20	D:\Projects\Real Madrid\Images\Match Co.	36	20	
Name 21	D:\Projects\Real Madrid\Images\Match Co.	37	21	
Name 22	D:\Projects\Real Madrid\Images\Match Co.	38	22	
Name 23	D:\Projects\Real Madrid\Images\Match Co.	39	23	
Name 24	D:\Projects\Real Madrid\Images\Match Co.	40	24	

Referees

GFX Referee N. GFX Referee Pt.

Referee 1

Referee 2

Referee 3

Referee 4

Ref. 5

Sponsors

GFX Sponsor Picture

D:\Projects\Real Madrid\Images\

Minutes Silence

Title 1

Handles on life

Tributed Match

Title 2

In memory of Henry, the best dog a man could have as a friend. Rest in peace funny chum.





# XPression Hardware and Software is Now Sold À la carte

<b>XPression</b> Hardware Edition ► Software Edition ▼	HD-SDI		IP (SMPTE ST 2022-6, SMPTE ST 2022-7 and SMPTE ST 2110)				12G
	2 Rack Units	4 Rack Units	2 Rack Units	4 Rack Units	2 Rack Units	4 Rack Units	4 Rack Units
	XPN-2RU-M7	XPN-4RU-M7	XPN-2RU-IP1-M7	XPN-4RU-IP1-M7	XPN-2RU-IP2-M7	XPN-4RU-IP2-M7	XPN-4RU-12G-M7
<b>Studio SCE</b> XSTS-0001	●	●	●	●	-	-	-
<b>Studio</b> XST3-0001	●	●	-	-	●	●	-
<b>Studio Flex</b> XSTF-0001	●	●	-	-	-	-	●
<b>BlueBox SCE</b> XBBS-0001	●	●	●	●	-	-	-
<b>BlueBox</b> XBB3-0001	●	●	-	-	●	●	-
<b>BlueBox Flex</b> XBBF-0001	●	●	-	-	-	-	●
<b>Clips 1-Channel</b> XCLS-0001	●	●	●	●	-	-	-
<b>Clips 2-Channels</b> XCLD-0001	●	●	-	-	●	●	-
<b>Clips 4-Channels</b> XCLF-0001	●	●	-	-	-	-	-

# M7

2RU



4RU



- Single Channel, Triple Channel, or Flex Editions
- HD-SDI single channel to 12G or Quad-Link UHD/4K
- IP to support SMPTE ST 2022-6, SMPTE 2022-7 and SMPTE ST 2110 in Single or Dual Channel configurations



XPression

# For The M7 Platform

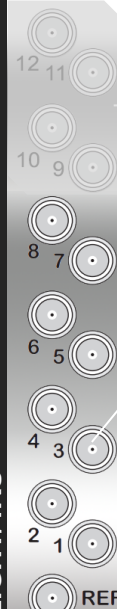
## Matrox DSX LE4

### 8 Bi-directional Video I/O Ports

- Ports are enabled by software licence
- DSX LE4/8/100F in 4RU has breakouts for AES, LTC and GPI/O
- DSX LE4L/8/100F used in 2RU is a half-height card, no AES, LTC or GPI



FULL HEIGHT/4RU



AES, LTC and GPI/O ports on connected cards

Up to 8 ports active at any time

Bi-Directional Ports using HD-BNC

HALF HEIGHT/2RU



XPression  
Studio

I/O Ports show for illustration purposes. Actual I/O ports used may vary

Used in the 2RU and 4RU

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XPression  
BlueBox

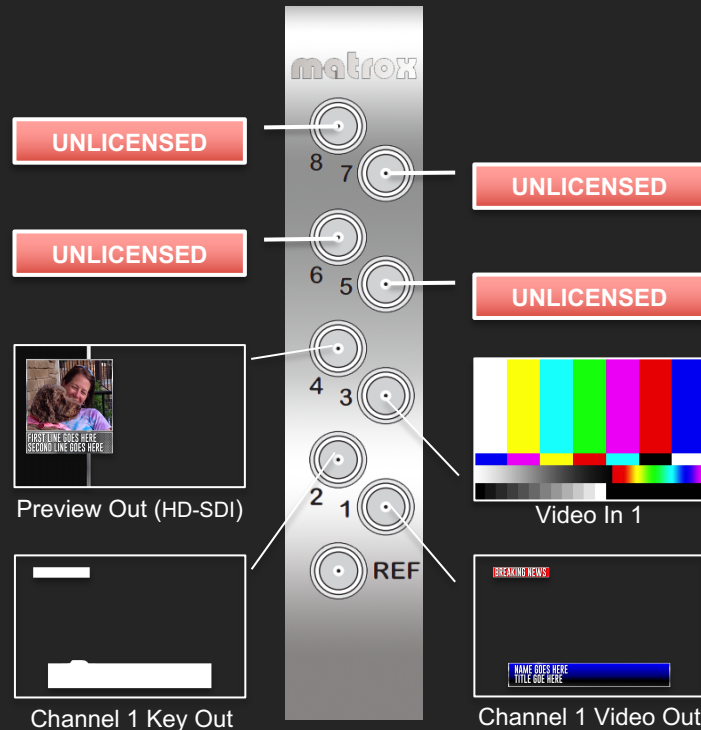
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Production Technology Experts

**XPression**

# For The M7 Platform

## XPression Studio/BlueBox **Single**

- 1 Channel (Fill/Key pair) Out
- 1 Fill input
- 1 Preview Output
- Video ports 5-8 are unlicensed and not active on the card



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**Studio**

I/O Ports show for illustration purposes. Actual I/O ports used may vary

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# For The M7 Platform

## XPression Studio/BlueBox **Triple**

- 3 Channels (Fill/Key pair) Out
- 2 Fill inputs
- Limited to 3 channels and 2 Inputs or Preview channels
- Outputs could be used as Previews
- No UHD/4K available on this software edition



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Studio

I/O Ports show for illustration purposes. Actual I/O ports used may vary

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# For The M7 Platform

## XPression Studio/BlueBox Flex

- Provides 2 channels (Fill/key) out
- Get four Video Inputs to XPression Studio or BlueBox
- All 8 bi-directional ports enabled for video inputs or outputs
- Capable of UHD/4K workflows



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**Studio**

I/O Ports show for illustration purposes. Actual I/O ports used may vary

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# For The M7 Platform

## XPression Studio/BlueBox **Flex**

- 1 Quad-Link Channel of 4K/UHD (Fill/Key pair) Out



**XPression**  
**Studio**

I/O Ports show for illustration purposes. Actual I/O ports used may vary

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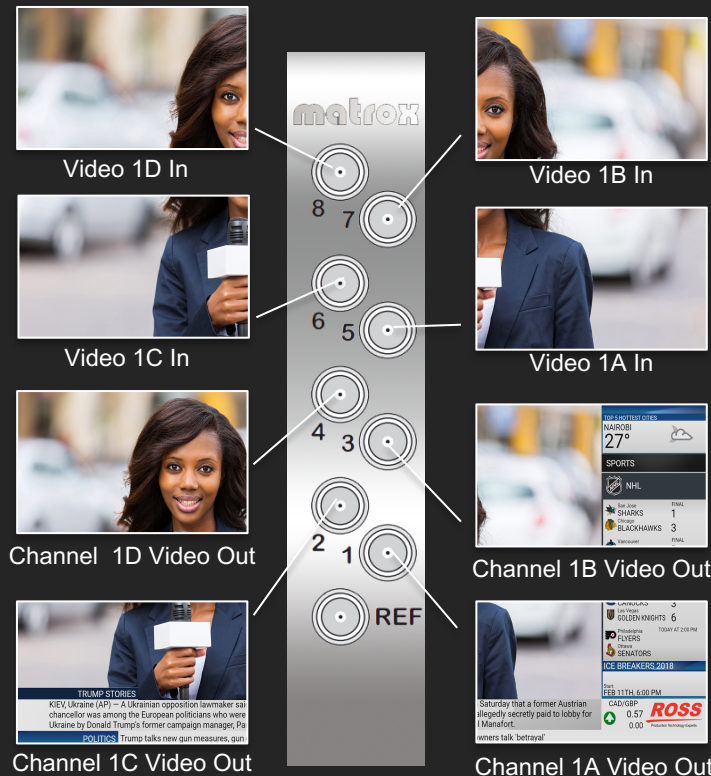
XPression

# For The M7 Platform

## XPression Studio/BlueBox Flex

Or Internal Keying

- 1 Quad-Link 4K/UHD Video out and 1 Quad-Link 4K/UHD Video In



XPression  
Studio

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XPression  
BlueBox

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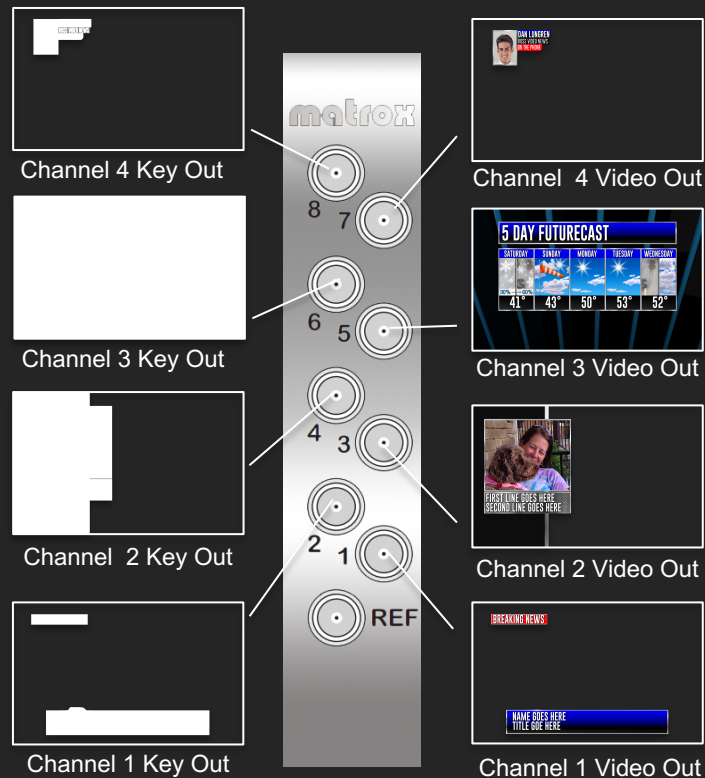
XPression

# For The M7 Platform

## XPression Studio/BlueBox Flex

Or Flex it into HD-SDI

- 4 Channels (Fill/Key Pairs) in HD-SDI



XPression  
Studio

I/O Ports show for illustration purposes. Actual I/O ports used may vary

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XPression  
BlueBox

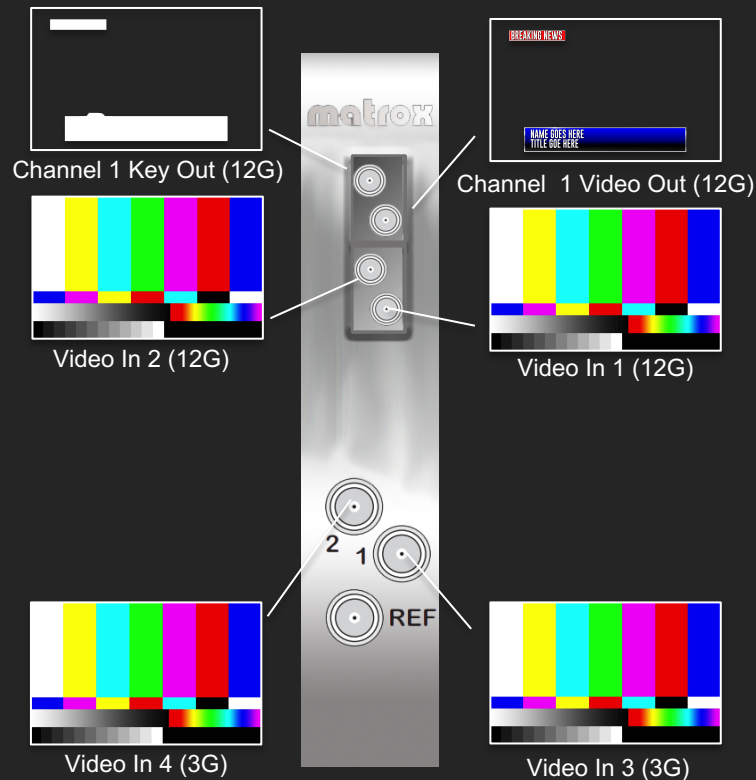
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**XPression**

# For The M7 Platform

## XPression Studio/BlueBox 12G

- 1 Channel (fill/Key) out
- 2 Fill inputs
- 2 additional bi-directional ports of up to 3G video in or out
- Requires two SFPs, sold by Ross Video, and are now included



**XPression**  
**Studio**

**Used in the 4RU Only**

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**BlueBox**

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# New Video I/O Hardware for the M7 Platform

SMPTE ST 2022-6, SMPTE 2022-7 and  
SMPTE ST 2110



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**Studio**

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**XPression**  
**BlueBox**

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**XPression**

# For The M7 Platform

## XPression Studio/BlueBox IP **Single**

- SMPTE ST 2022-6 and 7 and 2110
- Allows for 4 streams of IP Video
  - 1 Channel (fill/Key) out
  - 2 Fill inputs
  - SMPTE ST 2022-7 allows for redundancy on second SFP
- Requires two SFPs, not included



**XPression**  
**Studio**

**Used in the 2RU and 4RU**

**XPression**  
**BlueBox**

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**XPression**

# For The M7 Platform

## XPression Studio/BlueBox IP Dual

- SMPTE ST 2022-6 and 7 and 2110
- Allows for 8 streams of IP Video
  - 2 Channel (fill/Key) out
  - 4 Fill inputs
- Requires two SFPs, not included



**XPression**  
**Studio**

**Used in the 2RU and 4RU**

**XPression**  
**BlueBox**

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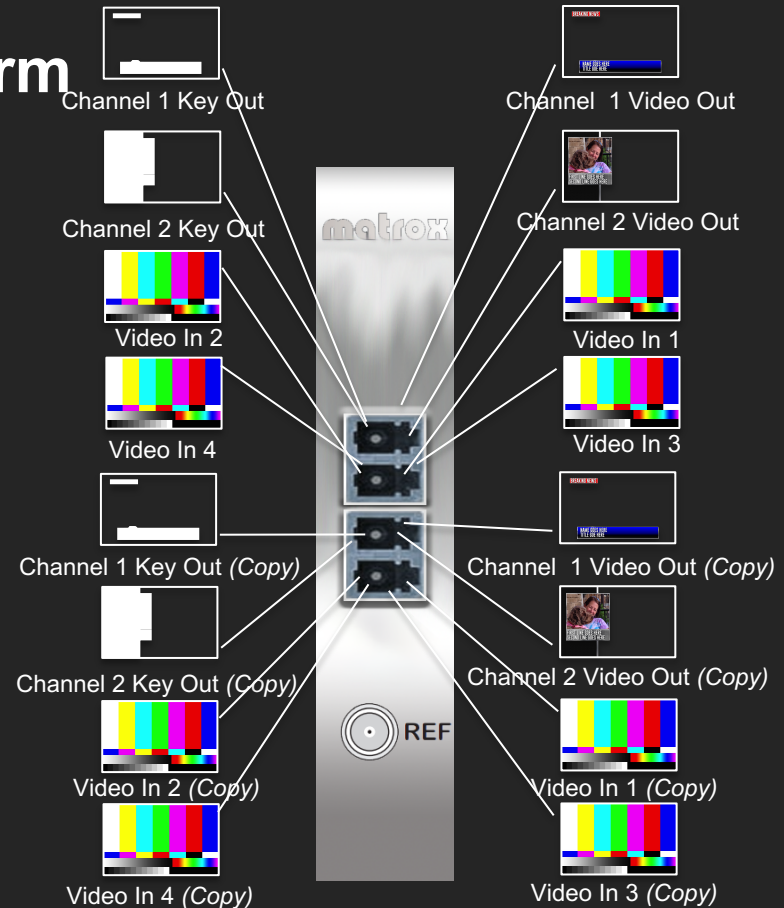
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**XPression**

# For The M7 Platform

## XPression Studio/BlueBox IP Dual

- SMPTE ST 2022-6 and 7 and 2110
- Allows for 8 streams of IP Video
  - 2 Channel (fill/Key) out
  - 4 Fill inputs
  - SMPTE ST 2022-7 allows for redundancy on second SFP
- Requires two SFPs, not included



I/O Ports show for illustration purposes. Actual I/O ports used may vary



**XPression**  
**Studio**

**Used in the 2RU and 4RU**

**XPression**  
**BlueBox**

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- Support of IP Standards and NMOS:
  - SMPTE ST 2022-6 & SMPTE ST 2022-7, SMPTE ST 2110 and NewTek NDI™
- Improved Implementation of HDR
  - Wide Color Gamut (Without Exponential Luminosity)
  - Hybrid Log Gamma (Including WCG)
- UHD/4K Video Clip Support
- Virtualization of XPression Servers and engines
- NLE Support for Adobe Premiere Pro

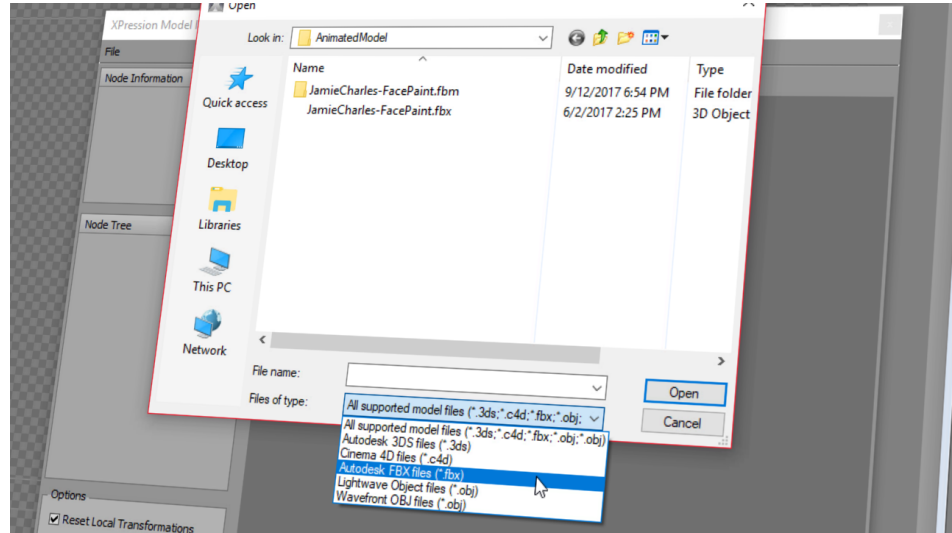


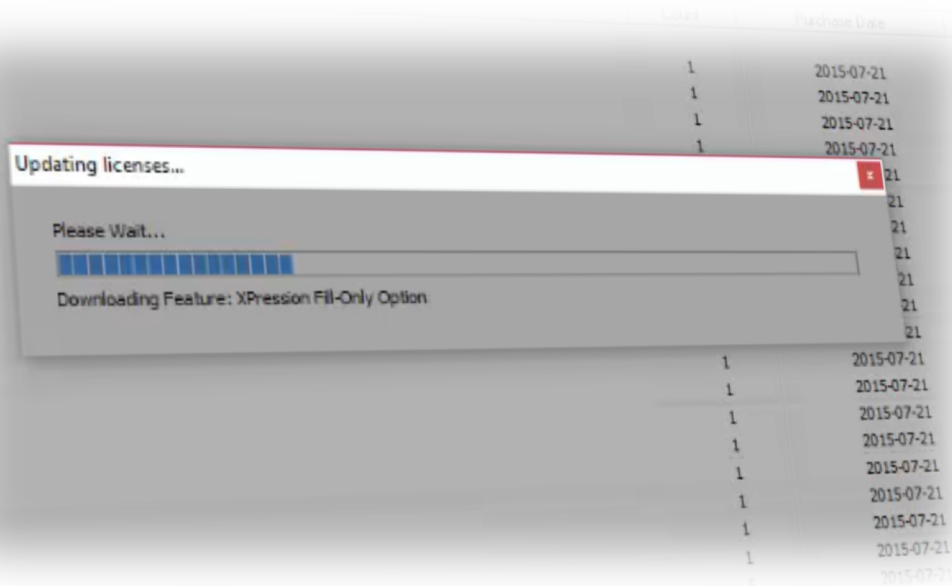
- Studio and BlueBox Available as 64-bit or 32-bit editions
- Enhanced Resource Availability
  - Improves Cache Management
  - Retains Fastest Recall Speeds
  - Allows For Larger Projects and Improved Project Management
- Apple QuickTime files are not supported in 64-bit applications



# XPression 3D Import Tools Expansion

- Cinema4D Model Import on 64-bit editions of Xpression
- Already Have Support For FBX, 3DS And OBJ Models

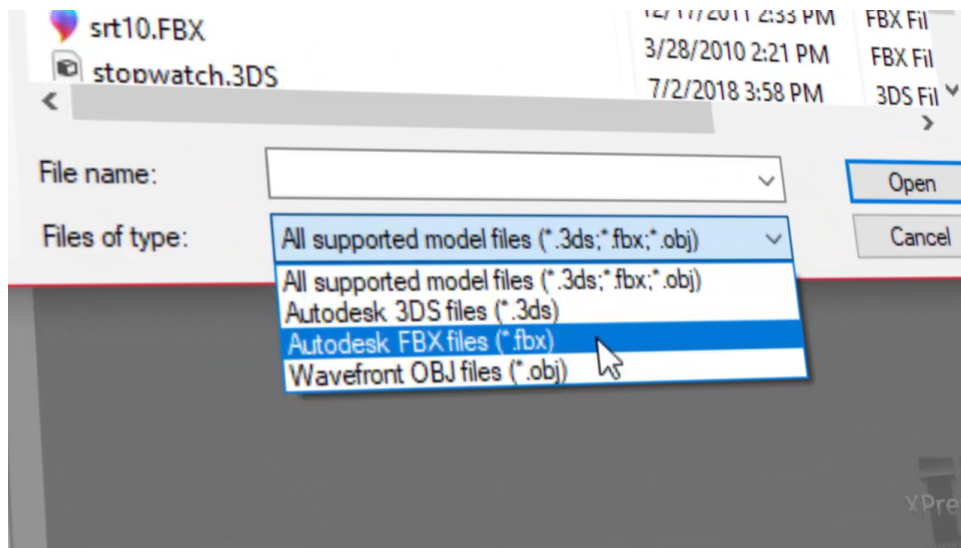




- XPression USB Dongles can now be programmed remotely
- Adding options can be done immediately
- No more shipping dongles to add features



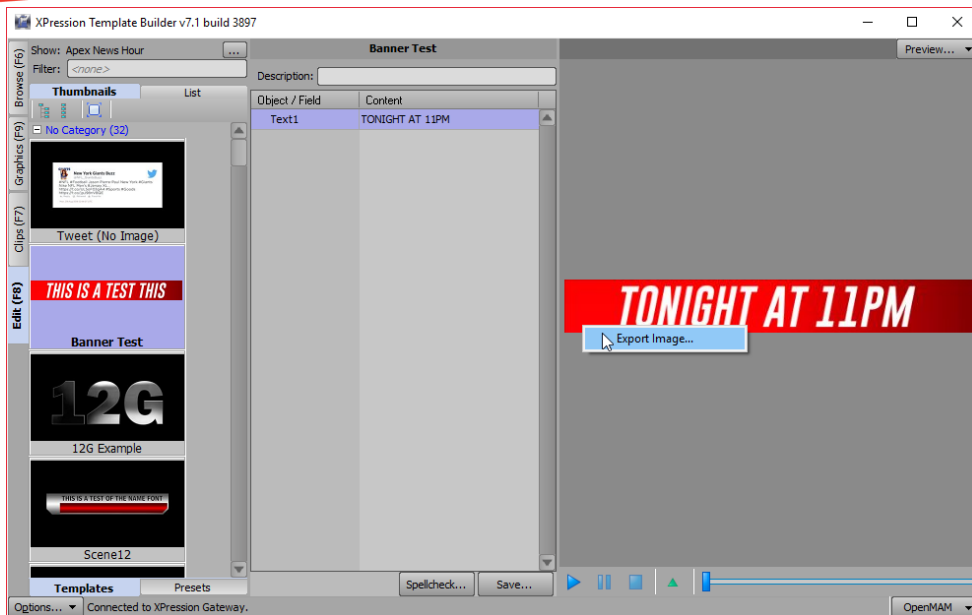
- Import 3D models using the .FBX interchange format in 32 or 64-bit editions of XPression Studio
- Brings in Models and Meshes from FBX models in one import



# XPression

## Using MOS Items in Desktop Workflows

- Preview Items In The MOS Plugin Can Be Exported To Local Desktop for Use In Web, Mobile, or Social Media

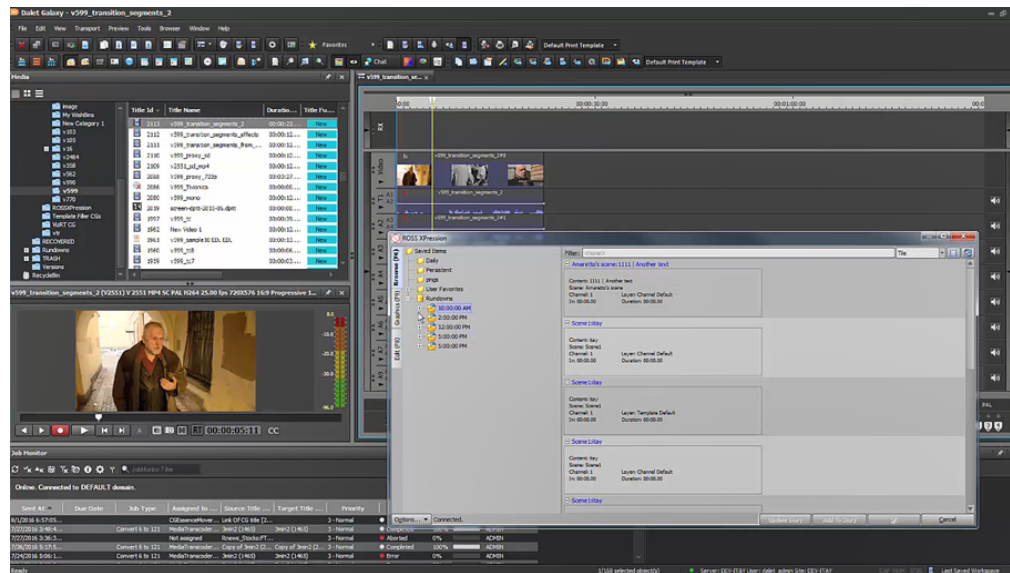


# XPression

# Dalet NLE Integration

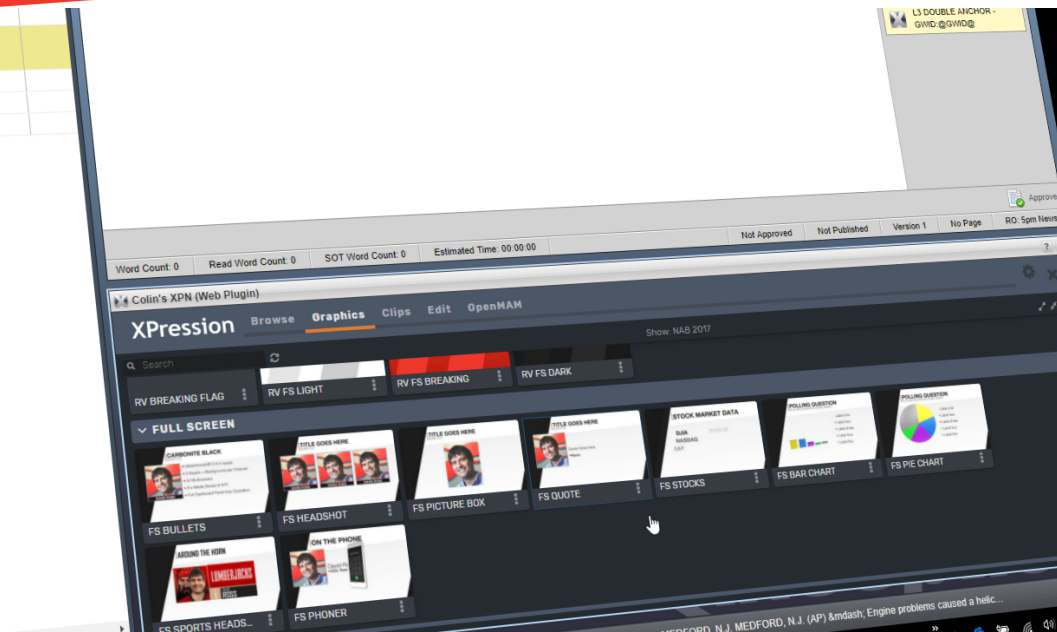


Currently in use at  
Several of the NBCU  
Owned Stations



**ROSS**  
LIVING LIVE!

**RELEASED  
XPRESSION  
8.0**



- Works in Mac or PC
- Cross-platform browser support for MOS workflows
- Support for
  - Microsoft Internet Explorer
  - Google Chrome
  - Apple Safari
  - Firefox

XPression

New Maps

XPressio



- Imports layered PSD files
- Each layer becomes a new material in the existing project
- Allows the XPression user to turn on/off alpha masks, and choose which layers to import
- Imports each layer as a material, at the size it appears in the PSD file, and not full canvas size

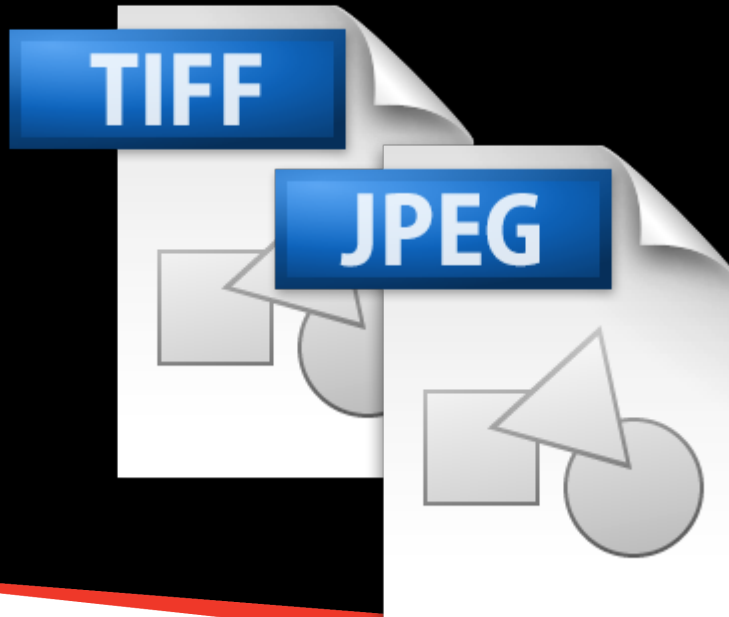


# HLG 10 Support



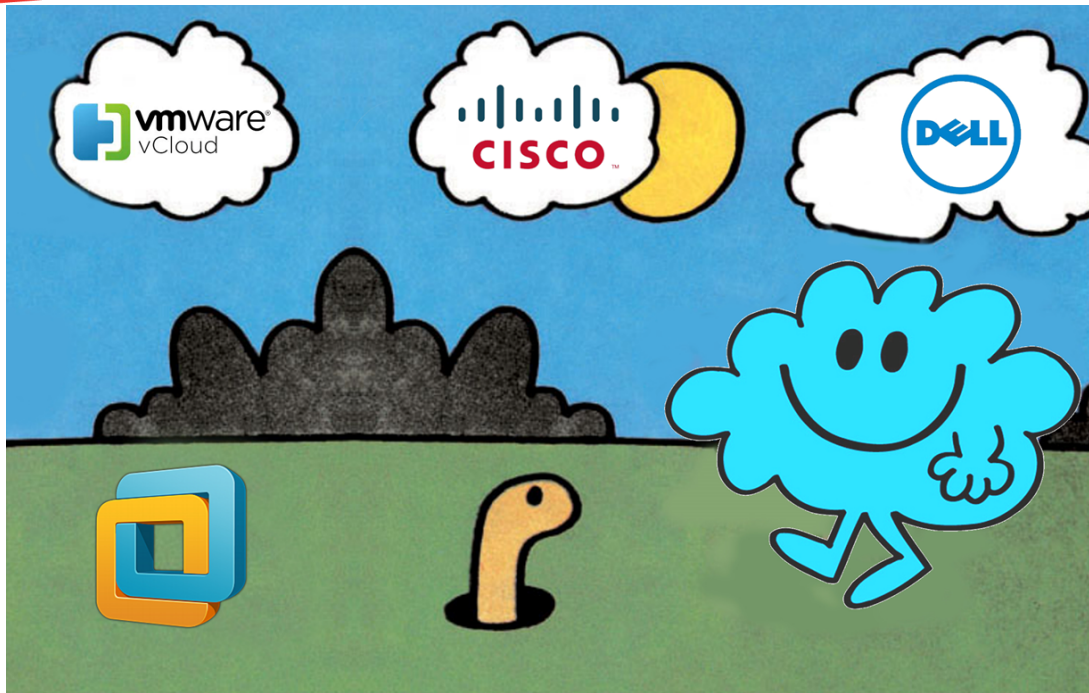
- © 2018 Ross Video - Confidential

# XPression UHD/4K and HDR Assets



- Updates to the XPression Video Codec to support UHD/4K and HDR
- Adding 10-bit file support
- Potentially support for additional Codecs as native playout for XPression Clips

- Ross Video is committed to Virtualization
- Demonstration at NAB 2018 and IBC 2018
- Working with Cisco, Dell, VMware and others
- Test customers in USA rolling out Virtualized XPression workflow for network program production



Roadmap items indicate planning efforts, but may not actually become shipping products or features by any specific date

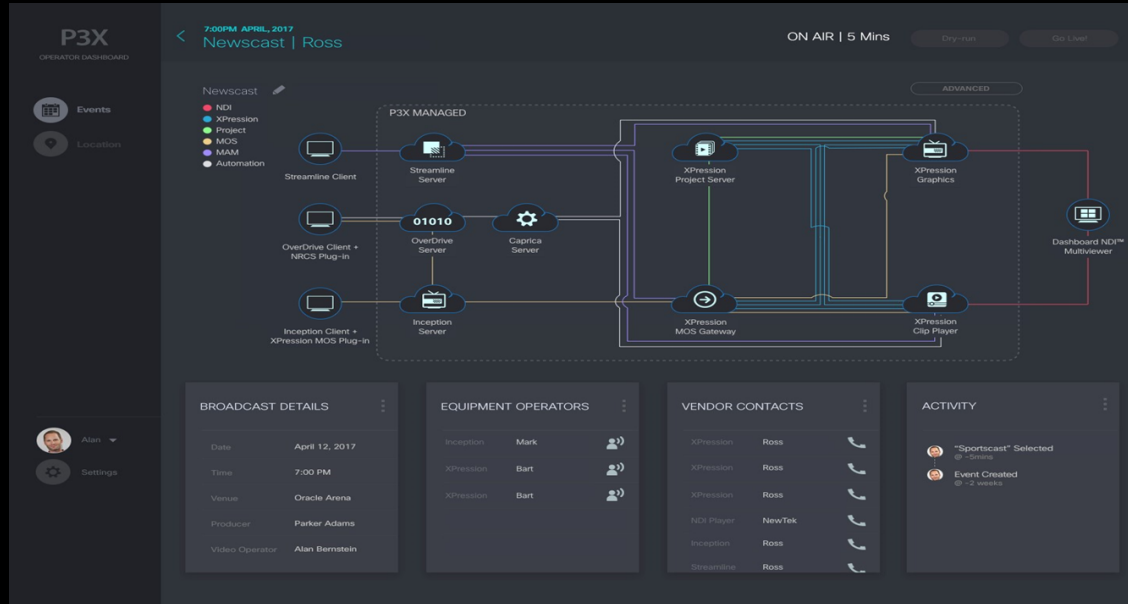


- Working with vendors to standardize on an orchestration layer for hardware
- Will develop specific editions of XPression software for virtualization
- Working on White Papers on how to set up Virtualized XPression Systems
- Currently focusing on private cloud workflows



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