NaSTA 18 - Talk for Semi Techies-
Objects.... Remote production – and jobs!!!

www.smpte.org/uk

SMPT E UK

Peter Weitzel SMPTE fellow
Hon Sec Treasurer UK Section  2012-18
International Membership Director 2015-17
What are SMPTE’s features

- Membership organisation
- International with 1/3 members not in USA
- Not a charity – USA Not For Profit
- Covers all Moving Images Audio and Metadata
- Has members – is run by members not staff
- Delivers Education
- Sets Standards

SMPTE in the UK

serves all who are working with the technology of moving pictures and associated sound & metadata – creatively, practically and innovatively in any format, and on any platform
SMPTE UK USP

Across the UK - with local “clusters”
580+ members – the Third Largest SMPTE Section
5 student chapters – more than 100 Students
Offer all the SMPTE Does
A “members organisation set up to educate”
......... But we also set standards - Which enable interoperability
Cover all Film TV and Digital media
Work to get the younger generation welcomed (not Students alone)
Being Business like ..... In UK and with SMPTE as a whole

How we organise...

Meetings
London plus suggestions to Kindred Societies & BVE, IBC etc.
Clusters – East, South, Around London – well established
Midlands North(Salford) West - developing

Younger Members & Student Chapters
BCU, Ravensbourne, Salford, Solent, Surrey- now +NFTS soon
Plus NaSTA – SMPTE awards £500 to NaSTA Tech award

Webinars
UK Section offers about 6 webinars to SMPTE central each year
What about Weitzel?

- Scripted an entire Blue Peter
- Produced and Directed items for "Tomorrows World"
- Produced wrote directed edited BBC Trailers  and Eng. recruitment
- Was a BBC Official spokesperson on Sex and Violence in Programmes
- BBC Exec Producer for Audio Description
- Did the risk assessment for "Otis the Aardvark dressed as nun on skateboard on the ring road!"

- Has qualifications in
  - Electrical Engineering (KCL)
  - Theology (KCL)
  - Management specialising in Corporate Strategy (Uni Of Westminster)
  - Group Psychotherapy (Birkbeck)
- Has been organising meetings for IEE/IET/RTS/SMPTE for 45 years
- Wrote first letter to The Times on “Engineering our Future” in 1980
- Served on Council of IEE and the Board of governors of SMPTE
- SMPTE Fellow 2017

And as a Techie!!!

- Knew that he wanted to work “behind the camera when 7 years old
- First paid by the BBC when 14 years old (50 years ago)
- Joined BBC in 1976 – and has worked in Projects/Strategy 1978-2010
- Installed first GVG 300 Vision Mixer in PAL (and it had a NEC DVE) costs £800K in 1980
- Designed installed studio with very software controlled Vision mixing system for BBC Sport
- Led teams installing new core systems in BBC Nations and Regions – while also going stereo and about 5 other projects

- Led the international standardisation of Teletext in various forms including the worlds first open standard EPG (& PDC)
- Major author of DVB Subtitle standard
- Developer, Editor and Implementer of Audio Description in the UK
- Co wrote the BBC Technology Business plan
- Working with Video and Audio over IP in 2000
- TDA for BBC broadcast connectivity 20 years
- Consulting for major International broadcasters
- Project Director first international UHD2 transmission (“8k”) 2008 (MPEG over IP)
- Mentored over 200 trainees
Agenda

• The future is IP
• Objects in media – Story telling
• Objects in media - some tech process IMF etc.
• Remote Production - expensive
• Remote Production - cheap! (but not quite cheap enough for Strident TV)
• Questions
  • The Industries and what skill does it need? /Jobs there are!!

The Future is IP

Internet Protocol is everywhere – ubiquitous
TCP-IP works fairly well for File transfer
UDP works fairly well for Streaming
The Equipment being mass produced is cheap
Thus lots of COTS kit available
Lots of people would work with IP – thus (cheap??) Staff
Software is everywhere

Broadcasters have some specialist requirements
Files are large and thus needs acceleration to move
Uncompressed video is UDP Multicast at Gbit/sec and requires constant low latency
Thus equipment is COT Top S
Very few people actually undersides at the "every particularly count" level....
There is no place for resend or just delay a bit!
Objects

Story telling
The 'objects' refer to the different assets that are used to make a piece of content. E.g a scenes in a drama or a caption
By breaking down
• a piece of media into separate objects,
• attaching meaning to them, (metadata)
• describing how they can be rearranged, (metadata)
a programme can change to reflect the context of an individual

Technical
Individual components Video Audio Subtitles/text with (technical) Metadata
Linked together by a list SDP or CPL More metadata
Referenced by a Unique ID (UMID) even more Metadata (very techy)
If stored – in a non File system structure
If streamed - time alignment matters PTP RTP Deliver Objects plus the lists to get the output!

BBC Says
This approach has potential to transform
• the way content is created and consumed:
• bringing efficiencies and creative flexibility to production teams,
• enabling them to deliver a personalised BBC to every member of our audience.

There is a lot more about Object based production at http://www.bbc.co.uk/rd/object-based-media
METADATA

OED definition
"A set of data that describes and gives information about other data."

Content = Essence + Metadata

Essence is the audio and video which makes up the item
So metadata is what make it count that you can find, use, sell, view etc.!

Technical Metadata –
often Machine only readable

Production / Descriptive metadata –
mostly Human readable

- Mandatory (really mean it) e.g. Video PID
- Mandatory (as Required by ....) e.g. Prog title
- Optional (May be good idea to have ) e.g. Device Serial no  Producers phone number
- Optional (Probably not needed for your workflow) e.g. Iris setting
- Persistent (for how long?)

Metadata was a topic in SMPTE @ NaSTA 2017
www.smpte.org.uk - NaSTA in the side bar
Outputs

Good Story telling

- The best bits of EastEnders
- A programme fits the time that the viewer has to enjoy it: this could be shorter or longer than the linear channel slot – “personal podcast”
- A story where the viewer take one of a number of viewpoints
- A story where the viewer can determine the outcome (like gaming)

Mermaid Tears – Radio Topic of SMPTE Solent Student Chapter last Thursday 12 April

Technology using Objects

Immersive sound

Dolby Atmos® and MPEG H and EBU AMD.

Have metadata with each audio stem saying where the sound is coming from and on replay the box renders this to come from that direction, no matter where the Loudspeakers are.

Adding Signing or different presenter to Weather Forecast


None of this is new

- Good bits of programmes
- Podcast have extra bits
- Extra elements are included to cover ad breaks / different parting – “The story of Blue Planet”

It is different ways of thinking from the start of production and we now have the technology – it can be done easily

Audio Description RX mix (DTT)

Transmits narrator voice plus metadata authored by the describer

- Pan byte – positions the voice in the soundscape
- Fade byte - dims the programme sound

A bit clunky - but it is Object Audio successful transmitted for 18 years!

(.and I wrote the specification)
IMF ST 2067

Interoperable Mastering format
Designed to solve two problems
a) To make versioning/ localisation of films easy
b) To provide a way of shipping the required content to and from POST house

What’s versioning / Localisation

A typical Feature film has over 700 versions
Different cuts of the video to reflect the local cultural requirements
With various audios technically - stereo 5.1, ATMOS as well as language/market and subtitles more languages than the audio!

In times gone by (and now?) this means making, checking and storing all versions
IMF the intelligent bucket (ST2067)

Original Version  Video (en)
Original Version  Audio (en)
French Audio (fr)
French Canadian Audio (fr)
Titles (fr)
Credits (fr)

CPL French Canadian
Timeline plus OV video
Titles (fr) video
Credits (fr) video
Snippets French and Canadian
French Canadian audio

Netflix demand IMF delivery and most of the major studios are working towards it

This is all that you need to make those 4 versions – a lot less essence – plus short “lists of how you make a version”
These are Composition Play Lists CPL
And at the heart of how IMF works (they are a bit like Edit decision lists)
And if you have checked the OV do you need to check the whole French version – just look at the edit points
There are other lists e.g.
PKL Packing list saying what is being received/sent when sharing the essence
OPL – Output list – techy things like SD
AMP – asset map – “a list of everything”

IMF – In online/ TV digital world aka the Pampers advert

Common Video (en)
New Mothers Audio (en)
New Fathers Audio (en)
Previous Mothers Audio (en)
Previous Fathers Audio (en)
Grandparents Audio (en)

Different end slates
Lots of Metadata

We can compose each version of the commercial by using a CPL to take video end slate and right audio ....
As each online platform needs different technical formats – why no output these using different OPLs (Broadcast uses AS11DPP)
And then why not do it “on the fly” for every call for that advert to be served ......

SMPTE has almost got a “Specification for Broadcast and online” use of IMF – work done in collaboration with the DPP
https://www.digitalproductionpartnership.co.uk/
EBU and NABA
Questions??

Remember – you are starting off in a world which is driven by metadata
And object based systems like IMF....
to support your programme making for very flexible use and reuse
And giving you time to be more creative

Remote Production
(Live) TV uses 3 Rooms

In simple terms

- Studio
- Talent
- Cameras
- microphones

Equipment

Control Room

Pictures and Sound

Prod / Dir

& mixing staff

what pictures

sound is output

What makes it all work - where the techies live

Comms and control + Rev Video

To cover events – put two on wheels

- Stadium
- Talent
- Cameras
- microphones

Equipment

Control Room

Pictures and Sound

Prod / Dir

& mixing staff

what pictures

sound is output

What makes it all work - where the techies live

Comms and control + Rev Video

Comms and control + Rev Video
Problems

- Takes time to drive the truck to location and set it up
- The Production, Craft and Eng. staff have to travel – takes time
- They have to stay somewhere - costs money
- Each Production may have a (slightly) different look
- Staff may not be used for whole day!

But it has worked very well for many years!!!

What if ...... Keep the two rooms static and join to various venues

Equipment

Pictures and Sound

What makes it all work - where the techies live

Say Dual path say 50 Gbit/sec carrying 24++ Cameras each at 1.5 Gbit/sec “NO DELAY”
EPL Uses this -

All cameras are fed over BT M&B circuits to IMG Stockley Park – Just north of Heathrow Airport
At full HD (and now UHD) bite rates
So they can be fed to
- Vision mixer - sometime more than 1 studio
- An EVS machine for each camera
- Editing system Ingest
(And the VAR feeds come over the same system)
They can be combined with local studio, complex graphics and stats and material for IMG Archive
And the same staff can do two matches a day without leaving the building

But it is not a cheap way of doing things ....
But EPL is a premium product – and so it needs to look good

See https://www.smpte.org/sections/united-kingdom/events/img-studios-creative-engineering-hub-sports-production-and-more

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But we are streaming / have not the money

Say a 20 Mbit/sec ADSL internet
Say < 1 seconds
Say < 300 milliseconds

Stadium
Talent
Cameras
microphones

Equipment
Proxy Pictures and Sound
Comms and control Plus IPframe

What makes it all work - where the techies live

Control Room
Prod / Dir & mixing stuff what pictures sound is output

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See the Problem – and solution

There is latency on the link
As the director I see the shot 1 sec after it was captured
I press the Cut button and it takes 300ms for the signal to get back!!!

The Output has just missed the Goal!!

See a video explaining all of this at http://suitcase.tv.co.uk/ look for iPhrame
And more at https://www.smpte.org/sections/united-kingdom/events/remote-production-over-ip-networks

IF we Stamp the source with Time (Techies like a thing called PTP)
And pass this time on the proxy feed
(it takes 700ms to code and 300ms to traverse the internet)
I press the cut button and it takes the Timestamp of the proxy feed as I press the button And send it back – taking 300ms
If the Vision mixer which is delaying the input
then outputs the frame with the time stamp it has just got ....

The output has the goal
– all be it just under 1½ seconds later!
There are some other problems .e.g. Camera cues

And it all worked ....@ the BBC Euro 2016
The Industries and Jobs

Basic Sector grid of the Industries

Notes:
Many Industries - not one!
The large Services sector may be split to cover wide spectrum from "Adverts" VFX via POST = Creative
Through OBs to Transmitters (Service Providers) and Systems Integrators = Technical
Note some are "not Media and Entertainment field"
But still the "art and science of the moving image"
And that engineering skills like numeracy and being organised work anywhere!

See more in "formation of UK Section" in https://www.smpte.org/sections/united-kingdom/events/bill-lovell-memoriallecture-2017
Skills you need

- Working effectively both individually and collaboratively as part of a team
- Ability to communicate clearly and concisely using appropriate discretion
- Build and maintain positive relationships with colleagues, customers and suppliers
- Demonstrate a passion for the broadcast media industry and its productions
- Display a strong work ethic and commitment.....And understand being timely
- Work accurately with a high degree of attention to detail whilst maintaining a wide overview
- Think creatively and logically to solve both technical process and creative issues
- Contribute to a process continual improvement of workflow and technique
- Proactively keep up to date with latest developments within the industries
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- Think creatively and logically to solve both technical process and creative issues
- Contribute to a process continual improvement of workflow and technique
- Proactively keep up to date with latest developments within the industries
- Uphold ethical and professional standards & Maintain company and customer confidentiality

Non Modo..... Sed etiam

The skills seem to be opposites.....

- You need to have a breadth of view and experience - NaSTA is good at this!
  ......And grow them – Don’t just sit in the corner!
There is a assumption that you will grow / keep up to date
You will move across the industries doing different jobs / roles for many employers
(and clients) –
As a “producer” you may think that you work on the left hand side – “creative”
- but how about doing they marketing / Comms for a manufacturer on the right hand side
And there is a shortage of Production Managers - those who really organise things creatively

Enjoy it – its Fun in the Industries of the Moving Image
NaSTA Tech Awards

Cover a wide range
• Innovations/ Products
• A major programme
• Developing Facilities
• Growing Skills/ Learning
Ideally “all of the above” but the balance may be very different

There is no show reel!!
• Good layout
• Logical story telling
• Appropriate Diagrams/photos/URL
• State requirements WHY
• Describe What and How
• Why was it a success (or not)
• What next?
“A Hand out to sell your abilities”

Does it make better Television

If you are (more than a bit) Techie
What can you do?

Join us
SMPTE UK needs more members to represent
• the wide range of industries
• and roles
• across the UK
So we can better serve the UK
As we grow the SMPTE UK community – and take an even greater role in the
UK “media tech” and “other” ecosystems
And in SMPTE developments world wide

Join in
• Attend meetings and activities
• Contribute to meetings etc.
• Run the SMPTE UK Business
• Mentor Younger members
• ....... And more

Like A Conversation with SMPTE Leadership

And your company can support and sponsor SMPTE UK activities in kind and in cash!
Join SMPTE Free first year then $10

- Meeting others working in our industries - that what SMPTE meetings are all about
- Receiving the Motion Imaging Journal (not associate members) - full of the latest techniques and news from SMPTE sections around the World
- Participating the Technology relevant webcasts at no Charge
- Access our archive - Look back over SMPTEs work over the past 100 years
- Attending events and conferences Courses at member discount rates - you can easily save your subscription (and it can be offset against tax)
- Getting Preferential booking for UK meetings
- Supporting those joining our industries through the Graduate Initiative
- Taking part in standards work and directing the way our industries move
- Just being an active member of the world's largest Members society for those working with the moving image, its audio and metadata- on any platform - Film, Television , Digital media
- And there are special awards for student papers etc. etc. $3k bursaries ....

BUT SMPTE needs you as a graduate and thus be someone changing our industries

www.smpte.org/uk
Look for NaSTA in Sidebar