CREATIVE NATION
CYMRU GREADIGOL

BBC Wales AUDIO DIGITIZATION – BISA 2018
British Broadcasting Company was established in 1922

BBC’s first broadcast from Wales – 13th Feb 1923

No recordings from early years – all broadcast live

Scripts and programme schedules/running orders have survived
BBC CYMRU WALES’ ARCHIVE

WW2 – reporting the conflict on radio
BBC’s Light Entertainment moved from London to Bangor

Early content includes:
- Radio plays
- Education and schools programmes
- News and sport
1950’s, 1960’s, 1970’s

Output expanded to include all genres to provide a wide range of information, education and entertainment.

Broadcast in English and Welsh on radio and TV.


Collection now forms a valuable record of people’s lives, culture, traditions and interests of the people of Wales.
BROADCAST LANDSCAPE IN WALES

BBC Wales – funded through the licence fee

ITV Wales – commercially funded

S4C – Welsh language channel launched in 1982
HOW ARCHIVE IS USED

BBC productions – internal use for public service programmes

BBC Studios and Independent Companies – external use for public service broadcast

Commercial exploitation – licensed to production companies for other broadcasters/corporate use

BBC Wales/S4C archive agreement
THE PRESENT

BBC Wales is relocating to a new building in 2019

Co-locating with S4C

Providing playout, technology and archive services

New building has smaller footprint

Significant investment to digitise BBC Wales archive holdings

S4C digitising their collections separately
BBC WALES CENTRAL SQUARE
90 years’ worth of content doesn’t move itself…!
AV & AUDIO DIGITIZATION

64,500 AV tapes digitised (Beta SP, Beta SX, Digibeta and HD formats)
97,000 audio assets (1/4”, DATs, minidiscs, CDs)
Digital files ingested into BBC Digital Archive/Radio Digital Archive
Digitization for access, not for preservation
Minimum/existing metadata for digitization/ingest
Format conversion only – no metadata enhancement
FILM DIGITIZATION

13,000 film cans
Approximately 75% transferred to tape
Plan A - relocation
Plan B – digitization

1300 hours/75 hours per month
Early news and sport – complete by October 2019
THERE’S STILL MUCH TO DO...

Appraisal/selection/digitization
Production Files - 1548 boxes
Corporate Archive – 107 boxes
Stills collection – mix of copyright
AV rushes

Decommissioning/donation/disposal of assets in line with policy
BBC Archives

Securing the past for the future
CONSTANT
RECORD
ABSOLUT

Every drop of this superlative vodka has been crafted only with Swedish winter wheat near the small town of Ahus and continues a determined commitment to the pursuit of perfection since 1879.

IMPORTED
40% ALC./VOL. (80 PROOF) 4.5L
PRODUCED AND BOTTLED IN ÅBO, SWEDEN
# ASSETS
# ASSETS
# HOURS
# ASSETS
# HOURS
# TONNES
SOX : FFT
SOX : FFT
“Without data you’re just another person with an opinion”

W. Edwards Deming
FACTORY - LEAN

Prepare Diagnose Design Plan Implement Sustain

Processes

Think and feel

Manage and Measure
<table>
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<tr>
<th>Issues</th>
<th>Status</th>
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<tbody>
<tr>
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<tr>
<td>Damaged Sp'l</td>
<td>High Level</td>
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<tr>
<td>Splices Break</td>
<td>Distorted</td>
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<tr>
<td>Broken</td>
<td>Muffled HF Loss</td>
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<tr>
<td>Stretched</td>
<td>Dropout</td>
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<tr>
<td>Creasing</td>
<td>Oxide Loss</td>
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<tr>
<td>Edge Damage</td>
<td>Unstable Tone</td>
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<tr>
<td>Ingestor's Notes</td>
<td></td>
</tr>
</tbody>
</table>

**Title:** LISTENING CORNER

**Series:** LISTENING CORNER

**Manifest Duration:** 00:00:00

**Prog No:** 4690663

**QC Status:** Not Set

**Session / Parts:** PRM9755

1 of 1

**Ingestor's Notes:**

**Status:** Tape / Sess

**Ingest Rec:**
PHYSICAL SCANNING
BARCODES
<table>
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<th>Medium</th>
<th>Storage Density (bits/cm²)</th>
<th>Lifespan (years)</th>
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<tr>
<td>Stone</td>
<td>10</td>
<td>10,000</td>
</tr>
<tr>
<td>Paper</td>
<td>10,000</td>
<td>1000</td>
</tr>
<tr>
<td>Film</td>
<td>10,000,000</td>
<td>100</td>
</tr>
<tr>
<td>Disc</td>
<td>10,000,000,000,000</td>
<td>10</td>
</tr>
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</table>

“Preserving Moving Pictures and Sound” Wright 2012
LOTS OF COPIES KEEP STUFF SAFE
Assume an imperfect carrier

- If it moves, Checksum it
- If it doesn’t move, Checksum it
FILENAMES

BKD029986.wav
FILENAMES

BKD029986_79054025255fb1a26e4bc422aef54eb4.wav
We have established that low level data corruptions exist and that they have several origins. The error rates are at the 10^-7 level, but with complicated patterns.
The Domesday Gallery
LONG TERM
LONG TERM

__Approach__

The digitisation of selected videotapes will be carried out at BBC Archives’ Odyssey Park facility in South Ruislip using workflow systems built in-house by BBC Archives. These use Telesstream Lightspeed units to create the uncompressed master files, and FFmpeg to create IMX50 files from these, which are then re-wrapped to AS11 DPP files using bmuxtranswap.

BBC Archives have committed to a ‘touch once’ approach to the digitisation of these assets. This means each videotape digitisation should produce:

- A preservation quality digital copy of the videotape as Uncompressed 10-bit YUV 720x576 (v210) Quicktime (MOV) file with four 48kHz 24-bit uncompressed audio tracks. These uncompressed files are only stored on these LTO tapes.

- A broadcast quality digital copy of the videotape as an AS11 DPP MXF (720x608 IMX/D10 50Mbps with four channel 48KHz 24-bit audio) which will be imported to the BBC’s Digital Archive (VizRT’s Viz One MAM) resulting in these files being stored to a 2+1 storage level.

- Accompanying digital images of the physical asset, its packaging and any related VTR documentation that was enclosed within.

__Clipping__

The AS11 DPP MXF file will be clipped where possible to remove trailing black (or grey) and silence (with a 15 second handle) in order to minimise wastage of storage space in the BBC Digital Archive.
for the given track. This checksum was produced by mxf2raw during extraction of the MXF file from LTO tape. The values of these checksums are not stored inside the MXF file.

This XML document was produced by analysing D__37150401-LTA00089207.mxf.full_mxf_analysis.xml.

D__37150401-LTA00089207.mxf.full_mxf_analysis.xml

This XML file contains the full details produced by using mxf2raw to analyse the MXF file. Also refer to the summarised version of this XML file and its explanation.

D__37150401-LTA00089207.mxf.md5

This file contains the MD5 checksum for the entire MXF file. This checksum was produced by mxf2raw during extraction of the MXF file from LTO tape. This means that it was produced by the same process that was also fully reading (and partially verifying) the MXF file. This checksum also appears in the XML files included in this collection.

D__37150401-LTA00089207.mxf.sha1

This file contains the SHA-1 checksum for the entire MXF file. This checksum was produced during the extraction of the MXF file
Figure 5 Preface and content storage packages

The Preface set contains two BBC extension items, D3P D3 Error Count and D3P PSE Failure Count, defined in Table 1. These count values are useful when reading a file from an LTO tape because the series of D3 VTR replay errors and PSE analysis failures are recorded in the footer section and are only available once the whole file has been transferred from the tape.

<table>
<thead>
<tr>
<th>Name</th>
<th>Meaning</th>
<th>Type</th>
<th>UL</th>
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</thead>
<tbody>
<tr>
<td>D3P D3 Error Count</td>
<td>Total number of D3 VTR replay errors</td>
<td>UInt32</td>
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<td>D3P PSE Failure Count</td>
<td>Total number of PSE analysis failures</td>
<td>UInt32</td>
<td>06.0e.2b.34.01.01.01.01.0d.04.01.01.40.01.02.00</td>
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Research & Development

White Paper

WHP 241

April 2013

A Guide to Understanding BBC Archive MXF Files

M. Glenville and T. Heritage
const MXFMCALabelIndex *mca_label_index = reader->GetMCALabelIndex();
map<Uint32_t, vector<AudioChannelLabelSubDescriptor*>> c_labels;
map<UUID, SoundfieldGroupLabelSubDescriptor*> sg_labels;
map<UUID, GroupOfSoundfieldGroupsLabelSubDescriptor*> gosg_labels;

for (i = 0; i < sound_info->mca_labels.size(); i++) {
    AudioChannelLabelSubDescriptor *c_label = sound_info->mca_labels[i];
    BMX_CHECK(c_label->haveMCACannelID());
    c_labels[c_label->getMCACannelID()].push_back(c_label);

    if (c_label->haveSoundfieldGroupLinkID()) {
        UUID link_id = c_label->getSoundfieldGroupLinkID();
        MCALLabelSubDescriptor *label = mca_label_index->FindLabel(link_id);
        SoundfieldGroupLabelSubDescriptor *sg_label = dynamic_cast<SoundfieldGroupLabelSubDescriptor*>(label);
        BMX_CHECK(sg_label);
        sg_labels[link_id] = sg_label;
    }

    if (sg_label->haveGroupOfSoundfieldGroupsLinkID()) {
        vector<UUID> link_ids = sg_label->getGroupOfSoundfieldGroupsLinkID();
        size_t k;
        for (k = 0; k < link_ids.size(); k++) {
            UUID &link_id = link_ids[k];
            MCALLabelSubDescriptor *label = mca_label_index->FindLabel(link_id);
            GroupOfSoundfieldGroupsLabelSubDescriptor *gosg_label = dynamic_cast<GroupOfSoundfieldGroupsLabelSubDescriptor*>(label);
            BMX_CHECK(gosg_label);
            gosg_labels[link_id] = gosg_label;
        }
    }
}
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</table>
BBC Archives

Securing the past for the future

steve.daly@bbc.co.uk
THE FUTURE
Brave new world = change is the only constant
Technology & Automation vs Skills & knowledge
Self serve
Role of archivist?
SO WHAT NEXT?

Digital preservation challenge

Retention of physical assets

Digitization is the first step

Opening up the archive is our goal

We want to share our collections with the people of Wales and beyond