

NAME

DabMux - Create a multiplexed ETI(NI) DAB(+)/DMB file

SYNOPSIS

DabMux **-f** numframes [**-z** hex_byte] **-o** outfile infile

DESCRIPTION

DabMux is a tool to multiplex one or more audio and/or transport-stream files into a valid ETI(NI) stream. The resulting stream can be used for DAB+/DMB modulation using the DekTec StreamXpress player.

OPTIONS

The following options are supported:

- | | |
|---------------------|--|
| -f numframes | The number of frames |
| -o outfile | Sets the output filename. The bitrate of the output file will be 2,048,000 bps. |
| -z hex_byte | Sets the value to be used as filler byte for the unfilled part of each frame. According to the standard this should be 55 (hexadecimal) which is also the default. |
| Infile | Name of the xml configuration file. The contents of this file as described in the section CONFIGURATION. |

CONFIGURATION

The root element of the xml document must be "ensemble". The following attributes can be used:

- Transmode The DAB transmission mode. Valid values are 1 to 4.
- Id Ensemble reference identifier.
- Country Country identifier. See **ETSI TS 101 756**.
- Ecc Extended country code. See **ETSI TS 101 756**.
- Label Ensemble label.

The "datetime" element is an optional sub-element of the "ensemble" element. It has the following attributes:

- Date The date/time of the start of the transmission in this format: "%d-%d-%dT%d:%d:%d" % year, month, day, hour, minutes, seconds
- Lto [Optional] The local time offset in half-hours from UTC

An ensemble has one or more services. Every service has their own "service" xml element. The following attributes can be used:

- Id Service reference identifier.
- Country Country identifier. See **ETSI TS 101 756**.
- Label Service label.

A service has one or more service components. A service component can be either an audio-stream or a transport-stream. The following attributes can be used:

- `primary` Set to "true" for the primary stream and to "false" for all other streams.
- `ca` Changes the values of the conditional access bit. Set to "true" or "false".
- `prot` Protection level for this stream. Valid values are "EEP-N[A/B]" with N in [1..4] and "UEP-N" with N in [1..5].
- `bitrate` Bitrate of the input file.
- `Filename` The filename of the input file.
- `Lang` [Optional] Language code according to ETSI 101 767 Table 9 and 10. Default is 0 (unknown).

Each service must have exactly one child element. This can be one of these elements: "mp2", "aac", "dmb", "data".

The "mp2" element has the following attributes:

- `Asct` [Optional] The audio service type. 0 (default) for foreground sound, 1 for background sound or 2 for multi-channel audio.

The "aac" element has the following attributes:

- `Dacrate` 0 if the DAC sampling rate is 32kHz, 1 if it's 48kHz
- `Sbrflag` 0 if SBR is not used, 1 if SBR is used.
- `Channelmode` 0 for mono, 1 for a stereo signal
- `Psflag` 0 if PS is not used, 1 if PS is used
- `Surroundconfig` See table 7 **ETSI TS 102 563**.

The "dmb" element has no attributes.

The "data" element has the following attributes:

- `Dsct` The data service type.

EXAMPLE CONFIGURATION

```
<ensemble transmode="1" id="0x123" country="15" ecc="0xE1" label="My
ensemble">
  <service id="3" country="15" label="Testradio 1">
    <component primary="true" ca="false" prot="UEP-3" bitrate="192"
filename="audiofile.mp2">
      <mp2 />
    </component>
  </service>
  <service id="5" country="15" label="Testradio 2">
    <component primary="true" ca="false" prot="EEP-3A" bitrate="64"
filename="audiofile2.aac">
```

```

    <aac dacrate="0" sbrflag="1" channelmode="1" psflag="1"
surroundconfig="0" />
  </component>
</service>
</ensemble>

```

MP2 INPUT FILE REQUIREMENTS

While DabMux itself doesn't impose any restriction on the MP2 files you can use as input, to be compatible with DAB receivers there are a few requirements:

- The sampling rate must be either 24kHz or 48kHz.
 - It must be encoded as Layer II
 - CRC protection must be enabled.
 - A special padding field has to be added in the ancillary data area
- The figure below illustrates the differences between a general MP2 audio frame and a DAB audio frame.

An open-source tool that can generate DAB MP2 audio files is tooLame. Source code can be downloaded from <http://sourceforge.net/projects/toolame/>. A windows binary can be download from <http://www.rarewares.org/files/mp3/toolAME0.21.zip>.

Example usage (input.wav is a wav file with 48kHz sampling rate). Output file has 192kHz bitrate.

```
Toolame.exe -s 48 -m -s -b 192 -e -D 0 input.wav output_dab.mp2
```

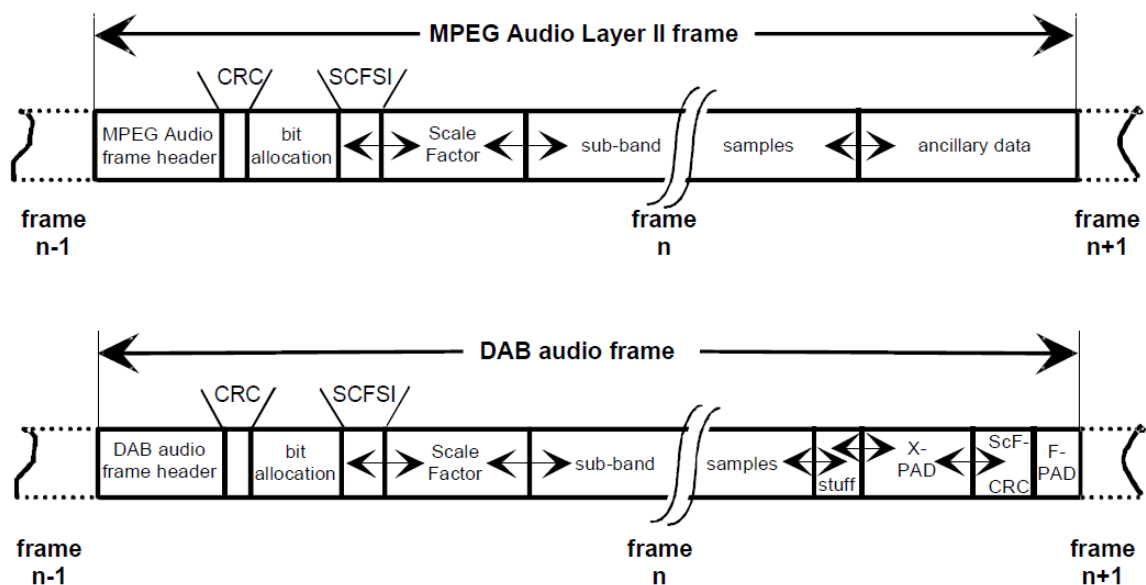


Figure 33 from ETSI EN 300 401

LICENSE

A valid DAB license installed on a DekTec modulator card is required to run DabMux.