MPEG-2 TS Player Software
Usage Instructions

- Windows 2000/XP
- Linux

1. Introduction

The DEKTEC DtPlay software is an elementary command-line program to play out an MPEG-2 Transport Stream with the DTA-100 (DVB/ASI output), the DTA-102 (DVB/SPI output) PCI card, the DTA-107 (QPSK Modulator), the DTA-110 (QAM Modulator), the DTA-140 (DVB/ASI input+output) or the DTU-205 (USB-2 ASI/SDI output).

The package includes the DtPlay source code, to (1) illustrate the use of the DTAPI library for building digital-video applications and (2) to provide a basis for creating a custom Transport-Stream player application.

The DtPlay package consists of the following files:

File	*Version*	*Description*
`DtPlay.exe`	none[1]	DtPlay compiled for Windows 2000/XP
`DtPlay.cpp`	`V2.2.0`	DtPlay source file with all application code
`Makefile`	none	Makefile for compiling DtPlay under Linux
`DtPlay Usage Instructions.pdf`	`V2.2.0`	This document

2. Running the DtPlay application

The following items are required to run the DtPlay application:

- The DtPlay executable file;
- The Dta1xx and Dtu2xx drivers[2], installed on the target system (the latest version of the drivers can be downloaded from on www.dektec.com);
- One or more DTA-100, DTA-102, DTA-107, DTA-110, DTA-140, DTA-545 and/or DTU-205 devices installed in the target system.

After start-up, the DtPlay application first prints the specified settings to the console[3]. Then play-out of the file commences. Play-out stops when end of file is reached, the user presses a key or an error occurs. Please refer to the Troubleshooting section (§5) for help on errors.

[1] DtPlay.exe does not contain a version resource. "DtPlay `-?`" prints out the version number.
[2] Note: the Linux version of the Dta1xx driver is part of the Linux SDK. Dtu2xx driver for Linux will be available soon
[3] Provided that the *run-silent* option (`-s`) has not been specified.

3. Command-Line Usage

3.1. Syntax

```
DtPlay playfile[4] -r Rate [-m Mode] [-t Type] [-n Number] [-p ON/OFF]
       [-mf Frequency] [-mt ModType] [-mc CodeRate] [-f YES/NO] [-s]
       [-?]
```

3.2. Options

-r Transport-Stream Rate in bps. The maximum supported rate depends on the board type used (150 Mbps for DTA-100, 108 Mbps for DTA-102, 214 Mbps for DTA-140 and DTU-205)

-m Transmit Mode (default **188**). See §3.2.1 for a more detailed description

Use:

- **188** 188-byte packets in file, 188-byte packets transmitted
- **ADD16** 188-byte packets in file, 204-byte packets transmitted (16 dummy bytes are automatically added to the packets)
- **192** 192-byte packets in file, 192-byte packets transmitted
  Note: this mode is only supported by the DTA-102
- **204** 204-byte packets in file, 204-byte packets transmitted
- **MIN16** 204-byte packets in file, 188-byte packets transmitted (last 16 bytes of packet are dropped or invalidated)
- **RAW** No notion of packets, data is transmitted as is

-mf[5] Modulation carrier frequency in MHz (default: 1915.0 MHz).

-mt Modulation type (default: **QPSK**).

Use:

- **QPSK** for QPSK modulation
- **BPSK** for BPSK modulation
- **QAM4** for QAM-4 modulation
- **QAM16** for QAM-16 modulation
- **QAM32** for QAM-32 modulation
- **QAM64** for QAM-64 modulation
- **QAM128** for QAM-128 modulation
- **QAM256** for QAM-256 modulation

-mc Convolutional rate (default: **3/4**).

Use:

- **1/2** convolutional rate = 1/2
- **2/3** convolutional rate = 2/3
- **3/4** convolutional rate = 3/4
- **4/5** convolutional rate = 4/5
- **5/6** convolutional rate = 5/6
- **6/7** convolutional rate = 6/7
- **7/8** convolutional rate = 7/8

---

[4] Name of the file to play out.

[5] This command line option is only used for the DTA-107 and DTA-110. For other boards this option has no meaning

-t Board Type to use (default: any output board[6])

Use: **100** for DTA-100
102 for DTA-102
107 for DTA-107
110 for DTA-110
140 for DTA-140
545 for DTA-545
205 for DTU-205

-n Board Number to use (default **1**)

Note: **1** indicates the first board

-p Target adapter power control. This option is operational only for the DTA-102 with a target adapter attached to it.

Use: **ON** Enable power to target adapter
OFF Disable power to target adapter (default)

-f Target adapter power control. This option is operational only for the DTA-102 with a target adapter attached to it.

Use: **YES** Disable power to target adapter
NO Leave power to target adapter as is (default)

-s Run in silent mode (i.e. no messages printed to the screen)

-? Display command line help

Notes

- The first option should either be the **playfile** or the help option.
- The Transport-Stream Rate option is mandatory, unless the help option is specified.

3.2.1. Transmit Mode

This section provides a more detailed description of the Transmit-Mode option. For a complete description of the Transmit Modes, please refer to the datasheets for the DTA-100, DTA-102, DTA-107, DTA-110, DTA-140 or DTU-205.

The Transmit-Mode option supports the following six modes:

- **188**: The **playfile** contains 188-byte packets. Packets are transmitted unmodified as 188-byte packets.
  In this mode, the hardware checks whether the overall packet structure of the stream is correct: every 188th byte of the stream should be a sync byte. If a sync byte is corrupted, data will be dropped up to the next sync byte, so that a correct packet structure is maintained at the output.
- **192**: Processing in this mode is the same as in mode **188**, but now with 192-byte packets.
- **204**: Processing in this mode is the same as in mode **188**, but now with 204-byte packets.
- **ADD16**: The **playfile** contains 188-byte packets. The hardware adds 16 "dummy" bytes to the end of each packet, in order to create an output with 204-byte packets.
  Sync bytes are checked in the same way as in mode **188**.
- **MIN16**: The **playfile** contains 204-byte packets. The hardware removes the last 16 bytes

[6] Any output board means the *N*th output board (either DTA-100, DTA-102, DTA-107, DTA-110, DTA-140 DTA-545 or DTU-205) found in the system, where *N* is the board number specified with the **-n** option.

from the end of each packet, resulting in 188-byte packets at the output.
On the DTA-102, the last 16 bytes of each packet are sent with DVALID set to '0'.
On the DTA-100 and DTA-140, the last 16 bytes of each packet are actually removed.
Sync bytes are checked in the same way as in mode **204**.

- **RAW**: The **playfile** may contain any type of data, not necessarily MPEG-2, which is transmitted without modification.
  The hardware does not check for packet boundaries. As long as there is data in the Transmit FIFO it will be transmitted.
  RAW mode is especially helpful in cases where the **playfile** contains intentional errors (e.g. missing sync bytes missing or packets with invalid size) for test purposes.

3.3. Examples

```
DtPlay myfile.ts -r 38000000

DtPlay myfile.ts -r 38014705 -t 107 -mf 1250.0 -mc 3/4

DtPlay "c:\Video streams\myfile.ts" -r 38000000 -t 102 -m RAW -n 2
```

4. Compiling the DtPlay Application

4.1. Compilation under Windows

Before compiling `DtPlay.cpp`, be sure to include (the path to) the DTAPI header file (`dtapi.h`) and to link with the library (`dtapi.lib)`. The latest version of these files is available on the DEKTEC website (www.dektec.com).

The DTAPI library has been compiled with the C/C++ Code-Generation Options in VC++ set to: "Use run-time library: Multithreaded." On the compiler command line this corresponds to the /MT option. DtPlay has to be compiled with this same setting, or a conflict with the version of the run-time library will occur.

4.2. Compilation under Linux

The DtPlay package comes with a makefile intended for compilation on a Linux machine. Before compiling make sure the makefile uses the correct include paths to the DTAPI include file (`dtapi.h)` and the DTAPI library file (`dtapi.o`). To compile, type 'make' in the directory containing `DtPlay.cpp`.

The DTAPI library for Linux is part of our Linux SDK, which can be downloaded from the DEKTEC website (www.dektec.com).

5. Troubleshooting

This section provides help for problems that might occur while using the DtPlay application. If the problem persists refer to §6.

5.1. DtPlay Errors

The DtPlay application can generate two types of errors, namely: command-line errors and application errors. Command-line errors are caused by missing or invalid options. Application errors indicate a problem with the system.

5.1.1. Command-Line Errors

The table below shows the possible command-line error messages and their probable cause(s):

Message:	Cause(s):
"Missing or invalid command line option(s)"	▪ An invalid option parameter has been specified (e.g. character(s) instead of a number, negative numbers or unknown parameter); ▪ An option has been specified more than once; ▪ An option is unknown; ▪ The option prefix is missing (all options except the `playfile` should start with '/' or '-', followed by the option identifier and an optional parameter).
"No play file specified"	▪ The `playfile` has not been specified as the first argument
"Transport-Stream Rate not specified"	▪ The transport-rate option has not been specified

5.1.2. Application Errors

Application-error messages start with "Error: ", followed by the error cause.

The table below shows the possible application error messages and their probable cause(s):

Message:	Cause(s):
"Can't set Transport-Stream Rate"	▪ The Transport-Stream Rate specified on the command line is higher than supported by the DTA-10x board
"Can't set Transmit Mode"	▪ The specified Transmit Mode is not supported by this DTA-10x board
"Can't set Carrier Frequency"	▪ The specified carrier frequency is not within the valid range for your modulator board (e.g. UHF or L-Band)
"Can't set Code Rate"	▪ Invalid convolutional rate was specified.

"Can't open `playfile` for reading"	▪ The specified `playfile` does not exist; ▪ The specified `playfile` is not accessible. Possibly the file is used by another application or the user does not have access rights for the file.
"FIFO underflow. Can't read data fast enough"	▪ The system is not fast enough for streaming data at the specified transport-stream rate: the hard-disk may not be fast enough or not enough memory is installed. ▪ Other applications are performing processor and/or hard-disk intensive tasks.
"No output board in the system" or "No DTA-10x in the system"	▪ No DTA-100, DTA-102, DTA-107, DTA-110, DTA-140, DTA-545 or DTU-205 device is installed in the system; ▪ The DTA-1xx or DTU-2x driver is not installed or not working correctly[7].
"Could not find output board #X in the system" or "Could not find DTA-1xx #X in the system" or "Could not find DTU-2xx #X in the system"	▪ The Xth board as specified by the Board-Number option is not present in the system; ▪ See also item above.

DtPlay can generate more application errors than specified above. However, the cause of such errors is not always evident and may require support from DEKTEC.

6. Contacting DEKTEC for Support

If the troubleshooting section does not provide a solution for your problem or the error(s) does persist you may send an email to support@dektec.com.

Please specify the following items in your problem report:

- The error message generated by the DtPlay application;
- The type of board used (DTA-100, DTA-102 DTA-107, DTA-110, DTA-140, DTA-545 or DTU-205);
- Operating System;
- Driver Version;
- DTAPI library version (for custom applications).

[7] Refer to the troubleshooting section in the Dta1xx or Dtu2xx driver installation guide for more details.

7. DtPlay Revision History

Revision	Date	Changes
V2.2.0	2005.09.22	• Added support for DTA-110 and DTA-545
V2.1.0	2004.11.18	• Added support for DTU-205 and DTA-107 • Updated to use DtDevice class as defined in the DTAPI (v2)
V2.0.0	2002.11.26	• Can now be compiled both under Linux and under Windows
V1.2.0	2002.11.12	• Support for packet transmit mode MIN16 • Support for DTA-140
V1.1.0	2002.07.26	• Added support for enabling/disabling power to target adapters (e.g. DTT-01/TTL)