UltiMOD Player for Windows
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n   Mail Registration

Send the following information and Check/Money Order in the amount of $20 U.S. to:

Thomas W. Olsen
163 Granville Road
Southwick, Massachusetts 01077
U.S.A.

Name:
Address:
City:
State:
Zip:
Country:
Diskette Format (3.5", 5.25"):
Where Did You Get UltiMOD?

n   CompuServe Registration

Dial into your CompuServe Account.
At any prompt type "GO SWREG"
Select Registration ID# "1823".
Registration fee of $20 U.S.will be billed to your CompuServe Account.

Introduction

Digital audio has beaten a serious path to the PC desktop thanks to the Multimedia capabilities of Microsoft Windows, and its usefulness extends far beyond mere voice-annotated spreadsheets into the realm of CD-quality recording and playback. Although Multimedia is a relatively new phenomenon to the PC, numerous other hardware platforms, including the Commodore Amiga and Apple Macintosh to name a few, have supported similar technology for several years now; consequently, Windows Multimedia developers should look to the pitfalls and successes of other platforms for valuable cues.

One of the primary limitations of digital audio is storage space: digital recordings require a LOT of room. For example, a two minute 8-bit mono recording sampled at 44.10 kHz occupies a 5.28MB WAV file. Double that figure for a 16-bit recording.

The Musical Instrument Digital Interface (MIDI) protocol overcomes space limitations by storing just the sequence of notes for a particular song; however, on the downside, MIDI does not guarantee that songs created on one synthesizer will sound exactly the same on another, nor can it reproduce a human voice. It may surprise you to learn that the Commodore Amiga supports 8-bit digital recordings of five minutes or more that fit on a single floppy disk. This remarkable feat is accomplished using the so-called Module (MOD) file format.
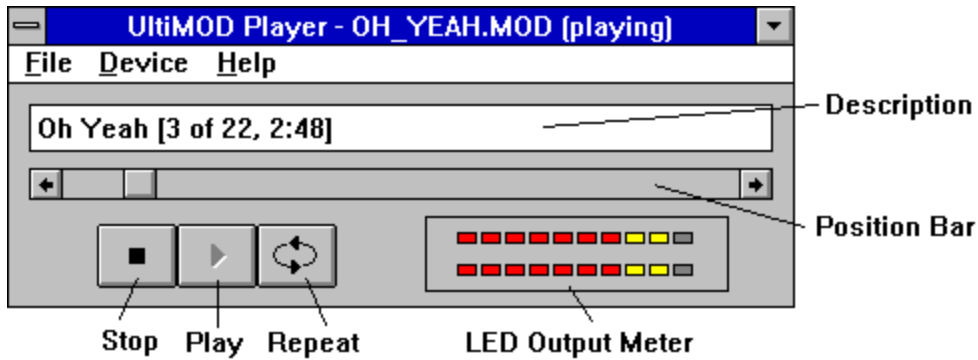
Using the UltiMOD Player
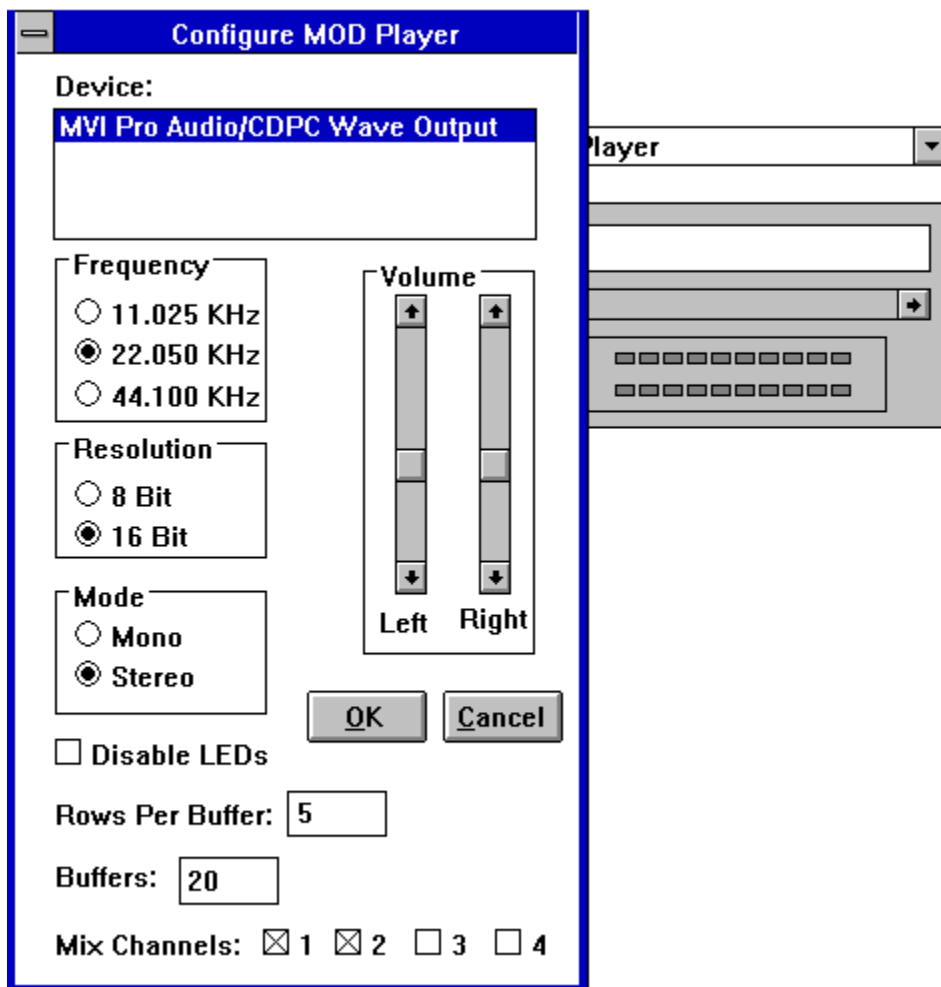Technical Information

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Using the UltiMOD Player

You already know the UltiMOD interface. It's the same basic setup as your home CD or cassette player. Of course, there are the standard Stop, Play, and Repeat buttons but wait...there's no Fast Forward or Rewind?!? No need--there's a slider bar for instant access to any portion of the song. Just grab the slider with the mouse and it will take you anywhere in the song. You will also notice the song description. It lists the title, number of "positions" (or segments), and an estimated playback time. Keep in mind, though, that the reported time is only an estimate and may vary depending upon the number of effects employed by the song.

Configuring UltiMOD

Configure MOD Player

Device:

MVI Pro Audio/CDPC Wave Output

Frequency
- ○ 11.025 KHz
- ● 22.050 KHz
- ○ 44.100 KHz

Resolution
- ○ 8 Bit
- ● 16 Bit

Mode
- ○ Mono
- ● Stereo

Volume

Left Right

[OK] [Cancel]

☐ Disable LEDs

Rows Per Buffer: 5

Buffers: 20

Mix Channels: ☒ 1 ☒ 2 ☐ 3 ☐ 4

UltiMOD should work with all Windows MPC-compatible sound cards, including ADLIB, SoundBlaster, and others supporting 44.1kHz 16-bit stereo audio output. By selecting the &File&Configure option from the UltiMOD Player menu, the following dialog box will appear. You can then modify device, volume, frequency, resolution, and mode settings:

n Frequency (or "Sampling Rate") -- This number specifies the number of samples that will be delivered to the sound card per second--the higher the number, the higher the quality of output. Keep in mind, however, that you will pay the price for higher audio quality with slower system performance, so choose 22.050kHz at all costs.

n Resolution (or "Bit Rate") -- This number specifies the volume scale (8-bits or 16-bits) which will be used for each sample. Specifying 16-bits reduces the amount of noise in each sample, but it's questionable whether you can tell the difference (since all MOD are recorded as 8-bit). Use 8-bits if possible.

n Mode -- This one is pretty self-explanatory but there is one small caution: UltiMOD *simulates* Stereo by playing two of the MOD channels to Left and the other two to Right (See Mix Channels--the unchecked channels go to Left and checked channels go to Right). If the MOD sounds weird in Stereo, you may need to remap the MOD channels with the Mix Channels selection.

n   Disable LEDs -- If you don't want to see UltiMOD's LED output meters, check this box. The LEDs are ON by default.

n   Left/Right Volume -- These scroll bars let you change the volume level for the sound card. IMPORTANT: If you move these scroll bars, the volume changes will take place regardless of whether you later choose &Okay or &Cancel.

n   Buffers -- Before UltiMOD can begin playback, it needs to allocate enough space for its WAV output buffers. You can specify a number between 1 and 30 buffers. This number--together with the Frequency, Mode, Resolution, and Rows Per Buffer--determines how much memory is needed. Allocating more buffers reduces the amount of memory available to other applications...but ensures that UltiMOD always has enough buffers to use and will not have to wait for one. You will have to experiment with this and the 'Rows Per Buffer' settings to tune the performance of UltiMOD to your individual machine. In
general, it's usually better to have a high 'Buffers' number and a low 'Rows Per Buffer' for better performance.

n   Rows Per Buffer -- This number, which ranges between 1 and 30, determines how many "rows" of instruments will be fed into each WAV buffer before it is delivered to the sound card. Remember: Specifying a large number means more work for UltiMOD and, hence, less processing time for other applications.

n   Mix Channels -- This option only applies if the mode is Stereo; otherwise, it doesn't make any difference. As mentioned previously, UltiMOD *simulates* Stereo by mixing 2 channels to Left and the other 2 channels to Right. You may not hear certain sounds in Mono because all 4 channels get mixed together. But, when you send 2 channels Left and the other 2 Right, sounds which were previously "lost in the mix" suddenly take on a life of their own. Not all MODs sound _good_ in stereo, though. Some artists don't give much consideration to which channels they're using (and some even count on their MODs being run in Mono only). But, on the bright side, these check boxes allow you to decide which channels to mix together-- unchecked channels go to Left and checked channels go to Right. If the song sounds choppy or skips, try altering the channel mappings first...and, if it still sounds lousy, try modifying the 'Buffers' and 'Rows Per Buffer' parameter...and, if worse comes to worse, try Mono.

Opening MOD Files

There are several ways to open and start playback of a MOD file.

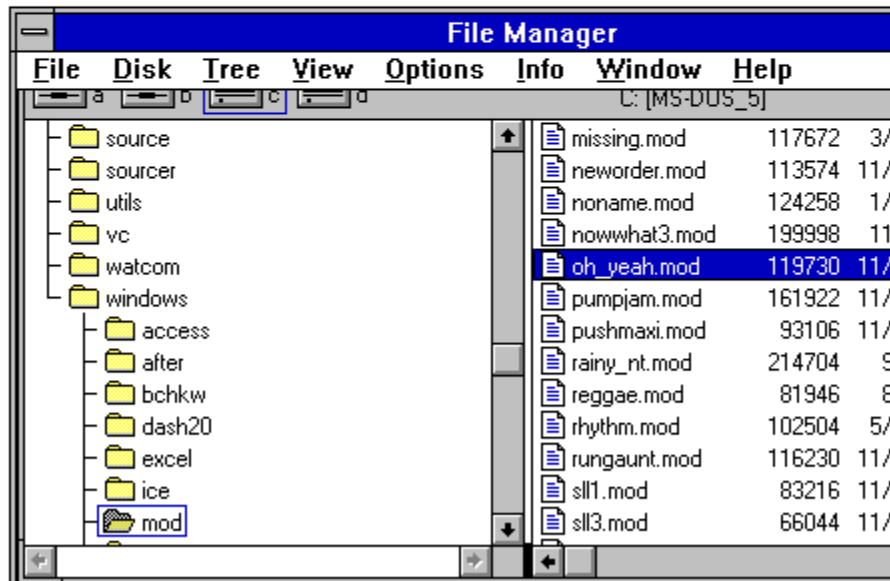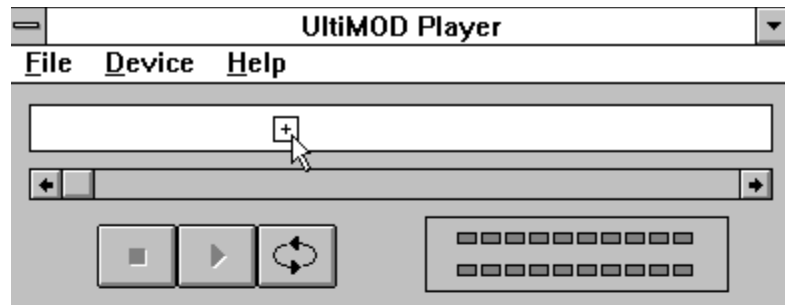n   &File&Open Menu -- The easiest way is to select the &File&Open menu item on the UltiMOD Player. The following dialog box
will appear (COOL TIP: This Open File dialog box allows you to select multiple filenames for playback. All that you
have to do is hold down the <Ctrl> or <Shift> key while clicking on the filenames. Then, when you click on &OK,
UltiMOD will begin playing back each selected file in sequence):
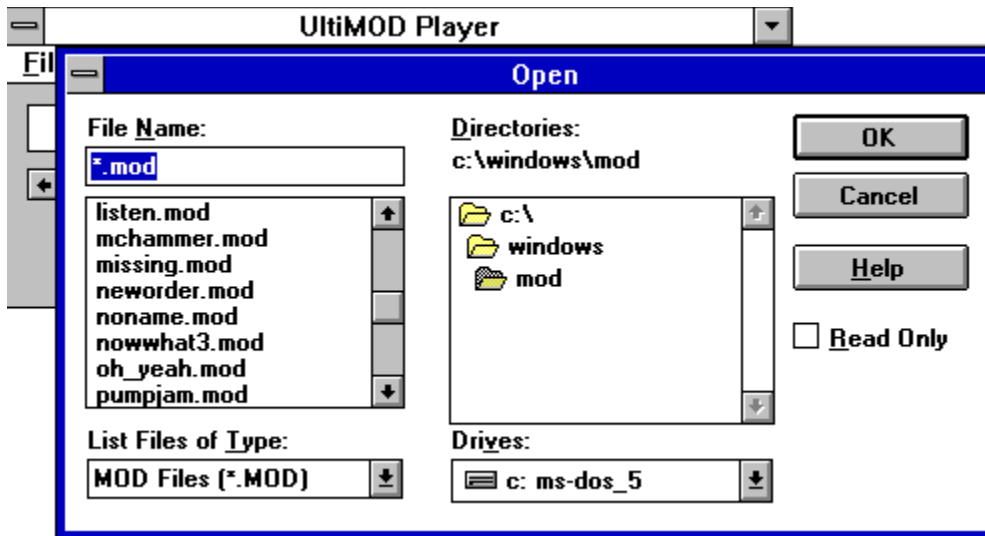
n   Instant Recall -- As you use UltiMOD, it remembers the last 5 selections that you've made...and stores them on the &File
menu. Clicking on one of the selections automatically loads that MOD file into memory and begins playback.
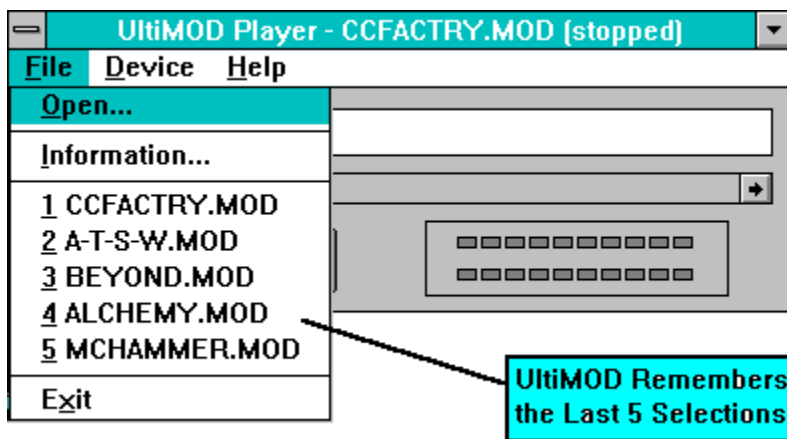
n   Drag-and-Drop -- Programs like the File Manager allow you to "pick up" a file with the mouse and drag it over to another application. UltiMOD recognizes Drag-and-Drop...and will begin playback immediately:

UltiMOD Player

File **Device** **Help**

File Manager

File **Disk** **Tree** **View** **Options** **Info** **Window** **Help**

C: [MS-DOS_5]

source		
sourcer		
utils		
vc		
watcom		
windows		
access		
after		
bchkw		
dash20		
excel		
ice		
mod		

missing.mod	117672	3/
neworder.mod	113574	11/
noname.mod	124258	1/
nowwhat3.mod	199998	11
oh_yeah.mod	119730	11/
pumpjam.mod	161922	11/
pushmaxi.mod	93106	11/
rainy_nt.mod	214704	9
reggae.mod	81946	8
rhythm.mod	102504	5/
rungaunt.mod	116230	11/
sll1.mod	83216	11/
sll3.mod	66044	11/

Anatomy of the MOD Format

The MOD file format falls somewhere between MIDI and
WAV format. MODs contain a bunch of digitized samples--called
instruments--in a format similar to WAV Pulse Code
Modulation (PCM). MODs were originally designed to have
15 instruments but it soon became necessary to expand
the number to 31, due to the growing sophistication of songs. Unfortunately, the architects of this change headed in opposite
directions and several different formats emerged--each named
after its respective MOD sequencer or "tracker" (ie. NoiseTracker, SoundTracker, etc).

Each digital sample represents one note of a particular
instrument in one pitch; that is, the digitized "plink" of a piano
or the "bang" of a drum. Human voice is considered an
instrument, too. This digitized waveform is a sort of instrument
"signature." Modifying the pitch, tempo, and attack of the digitized
sample enables you to reproduce virtually any note for a given
instrument. MIDI has 16 channels--MODs four; hence, four
instruments can be played simultaneously. MOD files contain tables
that describe when to play an instrument and upon which channel.
All kinds of special effects can be applied to individual notes:
arpeggios, portamentos, pitch and volume slides, vibratos, etc.
The following structures represent the least common denominator of the various MOD formats:

```
typedef struct tagMODHEADER
{
    char    name[20];
} MODHEADER;


typedef struct tagINSTRUMENT
{
    char        name[22];
    WORD     sampleLength;
    WORD     volume;
    WORD     repeatOffset;
    WORD     repeatLength;
} INSTRUMENT;


typedef struct tagPOSITIONTABLE
{
    BYTE     noOfPositions;
    BYTE     reserved;
    BYTE     position[ MAX_POSITIONS ];
} POSITIONTABLE;

typedef struct tagNOTE
```

```
{
    WORD      word1;
    WORD      word2;
} NOTE;

typedef struct tagCHANNEL
{
    NOTE      note;
} CHANNEL;

typedef struct tagPATTERNROW
{
    CHANNEL channel[MAX_CHANNELS];
} PATTERNROW;

typedef struct tagPATTERNTABLE
{
    PATTERNROW row[MAX_PATTERN_ROWS];
} PATTERNTABLE;

// This is the order of these elements in the .MOD file.

MODHEADER          modHeader;
INSTRUMENT         instrument[NO_OF_INSTRUMENTS];
POSITIONTABLE      positionTable;
PATTERNTABLE       patternTable;
```

NOTE: NO_OF_INSTRUMENTS defaults to 15, unless the .MOD file contains 'M.K.', 'FLT4', or 'FLT8' at Offset 1080 (decimal)--in which case there are 31 instruments.