

MU500

A Music 500 Compatibility Module for the
Music 5000

Angus Duggan

27 May 1993

Introduction

This document describes a software module which enables the Music 5000 synthesiser to play many Music 500 music programs without alteration. The module requires the M5 module from the Music 5000 Release 2 software to be available.

Words provided

The words provided by the MU500 module are detailed in this section. Note that some words have slightly different interpretations under the Music 500 and MU500.

,

This word is provided for compatibility only, and generates an error if used.

<

This word lowers the pitch of subsequent notes by an octave.

>

This word raises the pitch of subsequent notes by an octave.

@

This word finishes the previous notes, rests, or ties explicitly.

ADSR

Alters the current envelope to a simple attack-decay-sustain-release shape. The default parameters are:

Attack	1	Immediate attack
Decay	100	Medium Decay
Sustain	115	Slightly lower sustain level
Release	10	Soft release

number AENV

Sets the numbered envelope as the amplitude envelope for the current channel.

flag AGATE

AGATE sets the current channel's amplitude envelope to the start of the on or off section, depending on the value of *flag*.

***time* ATTACK**

Sets the attack time (in centiseconds) of the current envelope, which will normally have been set up by ADSR.

***length* BAR**

This word sets the bar length, for checking by bar lines. If the bar length is set to 0, bar length checking is disabled.

***period* depth CYCLE**

CYCLE makes the current envelope into a repeating up-down shape for use as a pitch envelope. The *depth* argument is the value of the peaks measured from zero. Negative depth arguments cause the pitch to drop first. The *period* argument is the period of the cycle in centiseconds.

***time* DECAY**

Sets the decay time (in centiseconds) for the current envelope, which will normally have been set up by ADSR.

***flag* EBIG**

Increases the range of pitch steps in the current pitch envelope. Pitch steps are normally $\frac{1}{16}$ semitone units, but can be increased to $\frac{1}{4}$ semitone units with this word.

***difference* time segment EGRAD**

EGRAD sets the gradient of a segment in the current envelope. The *difference* is in normal units of amplitude or pitch, with a range of -255–255. The *time* is in centiseconds, with a range of -127–127.

***level* segment ELEV**

This word sets the target level for a segment in the current envelope. This level must be reached before the envelope starts the next section.

***number* EMOD**

Sets an envelope as the current envelope for modification.

***on repeat off* ESECT**

ESECT sets the number of segments in each of the *on*, *repeat*, and *off* sections of the current envelope. There can be from 0–10 segments in the *on* and *off* sections, and 1–10 segments in the *repeat* section, but no more than 10 segments in the whole envelope.

NOTE()NOTE

These words enclose a sequence of words which are used as the playing action of the current player's notes. The sequence is called with the parameters:

pitch voice length

The default playing action is:

DURATION VOICE PITCH ON GATE

***number* PENV**

Selects an envelope as the pitch envelope for the current channel.

***flag* PGATE**

PGATE sets the current pitch envelope to the start of the on or off section, depending upon the value of *flag*.

***number* PITCH**

Sets the base pitch of the current channel.

***number* PLAY()PLAY**

These words enclose a sequence of words to be executed concurrently with other PLAY(...)PLAY sequences. The *number* controls which player the sequence is assigned to.

***number* PLAYERS**

Creates the specified number of dynamic players.

PVAR *address*

PVAR leaves the address of a player-specific variable on the stack.

RAND? *number*

This word generates a random number in the range -32768–32767 and leaves it on the stack.

***time* RELEASE**

Sets the release time (in centiseconds) of the current envelope, which will normally have been set up by ADSR.

REST()REST

These words set the enclosed sequence of words as the playing action for the current player's rests. The enclosed words are called with the following parameters:

voice length

The default playing action for rests is:

DURATION VOICE OFF GATE

SIMPLEA *number*

SIMPLEA leaves the number of the default amplitude envelope on the stack, for selecting with AENV.

SIMPLEACT

This word resets the playing actions associated with the current player to their default values.

SIMPLEP *number*

SIMPLEP leaves the number of the default pitch envelope on the stack, for selecting with PENV.

SIMPLEW *number*

SIMPLEW leaves the number of the default waveform on the stack, for selecting with WAVE.

SOUND

This word prepares a voice by resetting the channels to their default states, selecting default amplitude and pitch envelopes, the default waveform, setting the amplitude of channel 1 to maximum and the amplitudes of all other channels to zero.

level SUSTAIN

Sets the sustain level of the current envelope, which will normally have been set up by ADSR.

number TEMPO

TEMPO sets the period of the master timebase is 10 microsecond units. The default value is 1000.

TIE()TIE

These words set the enclosed sequence of words as the playing action for the current player's notes, when called by '/', '@' or ')'. The enclosed words are called with one parameter:

length

The default playing action for ties is:

DURATION

TIME number

Returns the time (in timebase units) to go before the next sound request on the player will play.

offset TUNE

TUNE sets a pitch offset which applies to the whole synthesiser. The *offset* is in $\frac{1}{16}$ semitone units in the range -1024–1023.

number WAVE

Selects a waveform for use by the current channel.

value point WG!

This word sets the value of a single point in the geometric waveform buffer. The value has a range of -127–127, and there are 128 points.

point WG? value

Reads a point from the geometric waveform buffer.

WGC

This word copies the content of the geometric waveform buffer to the current waveform (selected by WMOD).

***amplitude harmonic* WH!**

Adds a harmonic of the fundamental waveform into the harmonic waveform buffer, with a specified amplitude. The *amplitude* has a range of 0–127, and the *harmonic* has a range of 1–14.

WHG

WHG converts the contents of the harmonic waveform buffer into geometric form and stores it in the geometric waveform buffer.

***number* WMOD**

This word selects the number of the waveform for modification.

WZERO

Clears the geometric and harmonic waveform buffers.

Errors

The following errors are generated by the MU500 module:

' requires manual conversion

This error is generated by use of the tick word ('). Tick was used to distinguish between AMPLE words and user words with the same name.

Invalid envelope

This error is generated if an envelope number outside the range 0–15 is used.

Invalid point

Points in the range 1–128 are allowed in waveform definitions. This error is generated if a point outside of this range is used.

Invalid harmonic

Harmonics 1–14 are permitted for creating waveforms. An attempt to use a harmonic outside this range generates this error.

Invalid section

This error is generated if a segment number larger the number of segments in the current envelope is used.

Invalid waveform

This error is generated if a waveform number outside the range 0–13 is selected.

Too many sections

An attempt to create an envelope which takes the total number of segments over the maximum limit will cause this error.