YAMAHA

POWER USER

AW2816 / AW4416
Music Production

SETTING THE CLOCK & START POINT
WHEN WORKING WITH A MIDI SEQUENCER

This article will speak to clocking issues when using the AW2816 and AW4416 with an external sequencer. Units like the Motif keyboard workstation, RS7000 remix studio or any computer based MIDI sequencer can be used with great advantage with the AWs. Learning about the synchronization of the units is critical. Also of great use will be the lining up of the START TIMES of both units. The AWs have been taught how musicians keep time (Measures and Beats) and it can even provide an intelligent METRONOME to reference your recordings no matter how complex the time signature and tempo changes.

CLOCK ISSUES

Working with an Audio Workstation like the AW2816 or AW4416 and a MIDI sequencer gives you the best of both worlds: Audio and MIDI. Let's start our discussion with synchronization. You will be linking the two machines together via MIDI to accomplish the transfer of control data and timing data. You have the following options regarding synchronization:

MTC – MIDI TIME CODE. This is SMPTE Time Code configured to go down a MIDI cable allowing MIDI gear to synchronize with this film industry standard clock. It is divided into "Hours: Minutes: Seconds: Frames: Sub-frames" and is used to clock music/film or just music devices. The AW units can be the MTC MASTER (or Slave), while a sequencer like the ones in the Motif or RS7000 can *only* slave to MTC. The Motif/RS7000 can be a slave to MTC at 30-frames/sec. Check the Owner's Manual of your sequencer and determine if it can slave to MTC. The AW units have a dedicated MTC output – use this just for clock. In any scenario where you will be using MTC as your clock the AW should be set to 30 frames per second, and *it should be the MASTER clock*.

MIDI CLOCK - The AW and external sequencer can be synced via MIDI clock. The AW can generate MIDI clock (but does not receive it – for obvious reasons) and sequencers like the Motif/RS7000, of course, can send or receive MIDI clock. Therefore, in any scenario where you will be using MIDI Clock, *the AW will be the MASTER clock.*

When using **MTC** **sync** the following situations exist:
- The Audio Workstation should always the MTC Master
- The clock reference should be set to 30 frames
- The MIDI sequencer is set to MIDI SYNC = MTC
- The MIDI sequencer should be used in SONG mode (Song mode is the only mode that can respond to MTC). MTC uses Song Position Pointer to locate and chase-lock.
- MTC needs a dedicated cable for clock information. Set the AW's dedicated MTC output for clock information.
- The tempo of the Slave (MIDI sequencer) must match the tempo of the Master (AW clock). They **can** be set independently when MTC is in use – if you want them to reference time to the same tempo you must set them to the same BPM.

The reason MTC tempos can be set independently has to do with its use in film. That is, when you are referencing music (MIDI) to film, often you need to make the music fit a certain 'cue' point. The killer jumps from behind the curtain at 1hr: 20min: 33sec: 10.00frames, and there is a 30 second musical build-up. The composer has a 32-second piece of music. You can set the tempo of the music to climax at the given cue point by increasing the tempo. But for our purposes you will want the clock/temp in the AW to match the clock/tempo of the MIDI sequencer.

There is no single way you must work. Sometimes you will need to be building tracks while working with both units together.

The following situations will exist when using **MIDI** **sync** to clock the units:
- The Audio Workstation is the MASTER MIDI clock
- The MIDI sequencer is the MIDI Clock SLAVE
- The MIDI sequencer can be in Song mode (where Song Position Pointer will apply) or in Pattern mode (where you will have to ensure measure location manually).*...{ *this is an often-asked question: How come PATTERN mode doesn't auto-locate? It is simple logic. It can't – you have a four-measure pattern that cycles. You advance the AW to measure 53 – where is it within that pattern? You see, pattern mode has no linear time line and clock with locate needs a linear time line}
- The tempo of the Slave will automatically be set to match the tempo of the Master. They cannot be set independently.

The clocking options are very flexible and will allow you to work with the Sequencer (in record) while maintaining synchronization with the AW, if necessary.

Setting the START point of a SONG

It is recommended that you leave a small amount of time before the actual start of the song content. This way you can allow for count-ins and other musical ideas you may have at a later time. If you leave room in the beginning you don't have to worry about **not** having it if later you need it.

Here is a STEP-BY-STEP guide to the setting the critical clock START point of an AW2816/4416 SONG at the start of a session.
- Press the [SONG] button and select the [F1] SONG LIST screen
- Cursor to the "NEW SONG" box and press [ENTER]. The unit will ask you do you want to save the current song and then offers you the

opportunity to import data from an existing recording. This function[1] means that once you get to know the AW, you will be able to import your favorite setups from any previous recording sessions making working with the unit easier as you go along. Just select OK and press [ENTER]

- You can also NAME the SONG and write any comments about the session. If you have not invested in a simple serial mouse, do so. You will find it invaluable navigating the AW and especially when naming and writing comments. Best $10 you can spend!

- When working with music and musicians, you will find it convenient and wise to have the clock count MEASURES and BEATS. The AW can count hours, minutes, seconds, frames and fractions of a frame or just hours, minutes seconds and milliseconds, but when working with music and MIDI set the display to count in "musician language". Press [SONG]/ [F2] Setting, set the DISPLAY parameter to "Measure". This will increase your ability to "talk" music with the composer…most musicians know that the bridge starts at measure 49, not 1min:32.476seconds into the song.

- Next you will want to set up the Metronome function. You can set the metronome by pressing the [TRACK] button and selecting the F1 TRACK VIEW screen. Use the down cursor to the select the "METRO" ON/OFF parameter and turn it ON. This is an audible metronome but will not be recorded to the track (unless you have an open microphone near your speakers). You can use this click as opposed to the click of the MIDI sequencer for all recording, if you wish.

- Set the TEMPO MAP. Press the [SONG] button of [SONG]/[F4] to select the TEMPO MAP screen. Input the time signature and BPM of the song you are getting ready to record. You can actually create a tempo map event list, outlining any tempo changes or time signature changes that are in the song. By doing this ahead of time you can have the metronome count correctly no matter how complex the song. You cannot remove this "STEP 01" event. What you can do is affect *where* "Measure 001: beat 1" occurs. It is, generally, a good idea to place a few seconds in front of the meaningful start of the song, just in case you need you to build a count-in or want to place information in front of the main song. To

do this we can "Set the START Point"… This will be the time at which the measure counter begins and the AW begins to generate MIDI clock (or MTC) for controlling the connected slave devices. We will be literally placing measures prior to the start command of the clock. If at a later time you need to overdub a musical part that starts at measure 1, beat 1, you will be glad that you have this "count-in".

- Under the [TRACK] button select the [F4] MARK ADJ. screen and select the "LOCATOR POSITION" function. This will show you a list of key points within the recording. You will see START, END, Marker A, Marker B, and Last IN and Last OUT points of the SONG. Move the cursor to the 'frames' position next to the "START" time: **Hrs:Min:Sec:Frames:sub-frames:**

00:00:00:**00**.00.

The time is always displayed here in Absolute time. As you begin to move the Data Wheel clockwise to input a new start time the measure counter will begin to count backwards. As you dial up the frames you will see the BEAT counter start counting according to your selected time signature and tempo. If, for example, your song is in 4/4 time, you will see the BEAT counter count back from 4. As you scroll the time you can count how many measures of lead-in you are creating. For example, if you want a two measure count-in let it count backwards from 4 twice and add one extra tick (for good measure):
04 – 03 – 02 – 01 – 04 – 03 – 02 – 01 – 04
You stop at the next 04 so that when you start the playback you get the four-count *complete* twice.

PLAN AHEAD…
An important part of music production on the AW in conjunction with a MIDI sequencer, is the actual project planning. There are no specific rules or ways to proceed. Only suggested guidelines for using the strongest tool for the job given the technology. For example, the biggest advantage that recording as MIDI tracks offers you, is the ability correct the performance data and the ability to control the sound of the instrument. You can maximize the use of the synthesizer/tone generator by recording tracks as MIDI, correcting any performance errors in the event data and then maximizing the sound **before** transferring that MIDI track to the AW as an audio track. This is only one of many possible scenarios. You might never commit your MIDI tracks to audio. Instead you could use the AW tracks to record only acoustic sounds (vocals, live guitars, live drums, acoustic piano, etc.) while keeping the MIDI tracks "virtual". The word "virtual" here is used in

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[1] The AW2816/4416 can recall SCENE MEMORY, TEMPO MAP, AUTOMIX, LIBRARY settings, and MIDI REMOTE setups from any other session and import them to the new Song session.

the sense that the MIDI sequencer will run along side the Audio Workstation tracks in perfect synchronization. One of the main strengths of MIDI is that it is repeatable time and time again without varying. The AW2816/4416 is capable of handling eight channels of "live" input (each channel having its own EQ and dynamics processors) as well as playing back sixteen channels of audio from the hard disk (each channel having its own EQ and dynamics processors).[2] Therefore, many users will setup their MIDI rigs to playback live during the mixdown session. It really will depend on your music, your musical concept and your approach to music composition. With all the processing muscle you have available in the AW2816 and AW4416 you really do have some creative options. The idea is to know the rules, learn the tools and write your own script as to how you use it. You can use a combination of methods. "Whatever it takes" is the general rule.
Happy recording...

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[2] Of course, the AW2816 can be expanded to have 16 simultaneous inputs, and the AW4416 can be expanded to have as many as 24 live inputs with MY8AD cards.

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