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POWER USER

AW16G / MOTIF
Music Production Studio

The Setup: Clock and Synchronization Issues/
TEMPO MAP/
Recording AW16G Automation to a Motif track /
Using the AW16G as a REMOTE front-end to control the Motif sequencer tracks/
Setting the Song START POINT

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Background

The AW16G Audio Workstation linked to a Motif 6/7/8 Integrated Sampling Workstation is a very powerful combined tool for music production. It is a MIDI-and-Audio marriage that is hard to beat. The combination of tools will make your life easy once you are clear on how the two units best interface. There is not just a single way to connect and work with the two units; you will want to understand how they connect, and why, so that you can best make the units serve your creative ideas. No single guide can cover every possible scenario but we will attempt here to give you a solid plain language explanation of how it works. And what fits where…

The Motif is a keyboard workstation that has both MIDI sequencing and digital audio sampling as parts of its toolkit. The AW16G is a multi-track hard disk recorder with some pad sampling capabilities. Knowing what each is capable of doing will help you in planning your recording. The advantage of sampling in the Motif vs. recording in the AW16G or vice versa is a subject that has to be understood. A 'Sampler' like the Motif, typically has a comparatively small amount of record time (64MB total in the Motif), while the AW16G has a record time of 6.4GB per Song on a 20GB drive. There are one thousand megabytes in a gigabyte! The amount of record time in the AW16G is huge in comparison. But this is not a contest of memory length. What is important is knowing when to use the 'tool' the *sampler*. A sampler is like working in the microscopic domain. For example, if you need the sound of a finger snap for a song. In a sampler you could record yourself snapping your finger, once. Then use the sequencer's loop function to repeat the playback of that finger snap over the length of the tune. Linear recording uses continuous amounts of memory for storage. As you get to know these tools you will be able to maximize the use of the sampler in each device for its best purpose.

CLOCK ISSUES

Let's start our discussion with synchronization. You will be linking the two machines together via MIDI to accomplish the transfer of control 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" and is used to clock music/film or just music devices. The AW16G can be a MTC MASTER (or Slave)[1], while the Motif can *only* slave to MTC. The Motif can be a slave to MTC at **30**-frames/sec. Therefore, in any scenario where you will be using MTC as your clock the AW16G should be set to 30 frames per second, and *it must be the MASTER clock*. All setup for the AW16G is handled on the [UTILITY]/ MIDI page.

MIDI CLOCK - The two workstations can be synced via MIDI clock. The AW16G can generate MIDI clock (but does not receive it) and the Motif, of course, can send or receive MIDI clock. Therefore, in any scenario where you will be using MIDI Clock, *the AW16G will be the MASTER clock.*

What you need to know about selecting a sync mode: When you are using **MTC sync** between the AW16G and the Motif the following conditions should exist:

- The AW16G is always the MTC Master
- The AW16G Song is set to 30 frames
- You should be using a TEMPO MAP in the AW16G
- The Motif is set to MIDI SYNC = MTC
- The Motif is used in SONG mode (Song mode is the mode on the Motif that can respond to MTC).
- The tempo of the Slave (Motif) must match the tempo of the Master (AW16G). The Tempos can be set independently when MTC is in use – if you want them to reference time code to the same tempo you must set them to the same BPM. (Remember that MTC can be used to speed up playback to meet a specific cue point).

The Motif can slave to external clock and record MIDI events to its sequencer, simultaneously. In some cases you will be building tracks in the Motif independent of the AW16G – you can link up to the AW16G after you complete your MIDI Motif tracks. 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:

- AW16G is the MASTER MIDI clock
- Motif as the MIDI Clock SLAVE. MIDI SYNC = MIDI
- You should be using a TEMPO MAP in the AW16G

[1] In other scenarios the AW16G can be a slave, however when used with the Motif MIDI workstation the AW16G will always be the Master Clock.

- The Motif can be in Song mode (where Song Position Pointer will apply) or in Pattern mode (where you will have to locate measures manually).
- The tempo of the Slave will automatically be set to match the tempo of the Master. They cannot be set independently.

TEMPO MAP

The AW16G will let you create a TEMPO MAP, when you setup a Song. As we will see this TEMPO MAP is like the "control track". It will let us recall all kinds of events during the Song (like what sample is active on a PAD and what SCENE is active at a specific time) – it will read out in both the selected clocking time and in measures/beats. By creating a tempo map prior to recording you can 'chart' an outline of the structure of your song, no matter how complex in terms of time signature and tempo changes. Or you can simply input a time signature (4/4) and select a tempo (120bpm) and go. The AW will generate an audible metronome based on the Tempo Map, so not only do you have a controlling signal, you have a guide with which to play. It cannot be stated strongly enough, you will want to make a tempo map ***prior to recording*** any data. If you plan on using MIDI, even if you are not sure you will be using MIDI tracks later, you should setup to record as if you were. All that this means is, you should use the AW16G's built-in Metronome function as a guide. If you do this, you will have no problem making the Motif's MIDI sequencer (or any MIDI sequencer) play in synchronization with your audio, if you decide at a later time to add it.

In the following article we will set up to use the AW16G and the Motif together with MIDI synchronization options discussed.

THE MIDI CONNECTIONS

- Connect the MIDI OUT of the AW16G to the MIDI IN of the Motif.
- Connect the MIDI OUT of the Motif to the MIDI IN of the AW16G

THE AUDIO CONNECTIONS

In considering the audio connections from the Motif, it really is your choice and will depend on just what you will be recording. You can plug the STEREO L&R analog outputs to two analog inputs of the AW16G (for example, INPUTS 3&4). The Motif also has the analog Assignable L&R (asL&R) outputs. The asL&R can be addressed by the Motif as a stereo pair or as two individual mono outputs (asL and asR). Connect these to INPUTS 4&5.

Also available on the standard Motif is an optical digital output. You can connect this directly to the AW16G's optical digital input. The Optical is a digital version of the data that arrives at the analog L&R output.

Think of the Stereo L&R and the Optical Digital Stereo signal as representing the same signal (analog and digital versions of the same mix including the System Effects).

The overall output level of the Motif can be adjusted (0dB, +6dB, +12dB or +18dB). This is found in the Motif by pressing [UTILITY]/ F2 I_O/ SF2 Output.

The Assignable outputs are System Effect "dry" – meaning no System effects. While the Stereo Outs (digital and analog) have the Motif System effects ("wet") mixed with the signal. The Dual Insertion effect can be selected for any single PART of your multi-timbral MIX – and that PART can be routed to an Assignable output along with its INSERTION EFFECT.

If you expand the Motif with the AIEB2, this gives you 6 additional Assignable analog outputs, plus another optical connections (both in and out), plus a coaxial digital for good measure. Although the AIEB2 includes an additional optical (duplicates the other one) and a SP/DIF coaxial these are not useful in the Motif/AW Studio scenario. The additional Assignable outputs will give you plenty of options for tracking. The Assignable outputs on the AIEB2 can be addressed in stereo pairs (as1&2, as3&4, and as5&6) or as individuals (as1, as2, as3, as4, as5, and as6). Again, the Assignable analog outputs are "dry" with concern to the Motif System effects (Reverb, Chorus and Variation) but can be assigned the Dual Insertion effect for PART when that PART is routed to the Assignable out and its Insertion Effect is recalled. When you assign a Motif PART to an Assignable output and connect it to the AW16G input you can apply an AW INPUT Effect, a channel dynamics processor and a channel 4-band parametric EQ or select from the INPUT LIBRARY. Cool!

On the AW16G you need to connect the audio output of the MONITOR OUT to your power source or powered monitors. MONITOR OUT has a separate Volume control that will let you turn down the Volume without affecting recording levels.

SETTINGS within the AW16G

- Press [UTILITY] and select the MIDI page. Set the MIDI OUT column so that both "MIDI" and "CLK" are selected (darkened) if you want to use MIDI CLOCK. This will ensure that MIDI messages generated by the AW16G will be sent out and clock information will be sent out. Set it to "MIDI" and "MTC" if you want to use MIDI TIME CODE as your synchronization. In either case leave the THRU box clear (this echoes signal back to the source).

MMC or MIDI MACHINE CONTROL. This can allow you to select a "transport" controller. Basically, it controls the use the START/STOP/FF/REW functions on the AW16G or the Motif. If you set the MMC column in the AW16 to MASTER, then you must set the Motif parameter to receive this transport control message. [In the Motif it is called "**SeqCtl**", set it to IN- found in UTILITY/F5 MIDI/ SF3 SYNC.] When you are using MTC to link the units, **and** you want to use the transport of the Motif to start/stop and locate the AW16G, set the Motif's "SeqCtl" parameter to OUT and the AW16G as SLAVE to MMC. The Motif can act as MMC Master **only** while it is acting as a Slave to MTC – that's correct! You may experience a slight delay before commands respond when using the sequencer to MMC the Audio workstation. This is normal – it will begin when it can guarantee 'speed' (sync).

MTC – As mentioned, the AW16G will always be the Master clock when you are using MTC and the tempos must be set in both the Master and the Slave.

DEV – Device Number; This AW16G parameter is a MIDI communication bus between the Motif and the AW16G when using MMC. Set this to 1 in the AW16G and the Motif Device number defaults to ALL (you can leave it or set it to 1).

RX (RECEIVE) – You can select a MIDI channel to receive controlling events that you record to the Motif sequencer. This will be used when you are using the Motif sequencer to house AW SCENE events and MIDI automation commands. For example, you could dedicate a channel on the Motif to record automation commands for your AW16G MIX – mutes, Scene recalls, etc., etc. Range: Channels 1~16.

TX (TRANSMIT) – You can select a MIDI channel to transmit controlling events that can then be played back from the Motif sequencer to the AW16G automating the playback of the AW16G. For example, SCENE events are sent as Program Change events on the designated channel. And fader movements are transmitted as control change messages. Range: Channels 1~16.

PROGRAM CHANGE – Program Change events are used to recall AW16G Scenes (snapshots of all mixer settings). You can create a custom SCENE/PROGRAM CHANGE map in the AW16G.

Here you can set the AW16G to receive or send these events – depending on your need at the time. Range: OFF, RX, TX, or RX-TX.

CONTROL CHANGE - Control Change messages is data that can be used to automate the fader movements and other functions via MIDI. Here you will be selecting a mode for dealing with these messages. Range: OFF, 1, 2 or 3.

- Mode 1 will be used if you are using the entire Motif sequencer, all 16 tracks, to record AW16G mix automation events. Each track of the Motif will house control data for a track of the AW16G (not too efficient).
- Modes 2 and 3 will allow you to designate a single Motif track for **all** AW16G mix automation events (more likely what you want to do working with the Motif as your sequencer). The difference between these two has to do with if you want to automate the INPUTS, i.e., faders, effects, etc., you would use CONTROL CHANGE TYPE 2 (great for automating during a "live" session). If you want to automate the TRACK channels, i.e., faders, effect sends, etc., you would use CONTROL CHANGE TYPE 3. Therefore, for a mixdown you would want to use TYPE 3.

AVRG. – MTC SYNC AVERAGE. This parameter has to do with when you are using the AW16G as an MTC slave and are getting unsteady signal. This will **not** concern you in the AW16G/Motif hookup.

OFST+ – OFFSET. This parameter has to do with delaying the start point when you are using the AW16G as an MTC slave (a situation where you have 2 AW's in sync). This parameter will **not** concern you in the AW16G/Motif hookup.

SETTINGS within the Motif

In the Motif we will want to set up to 'slave' the sequencer to the AW16G's clock and set it to receive transport and other MIDI messages.

- Press UTILITY and select the F5 MIDI page. Press SF5 OTHER and make sure that the MIDI IN/OUT is set to MIDI, not USB
- Press SF3 SYNC and set the CLOCK to MIDI or MTC (as required)
- CLOCK OUT will not matter (the AW does not receive any kind of clock that the Motif generates). Set this to OFF.
- SEQ CTRL set as appropriate to whether you are using the Motif transport (OUT)[2] or the AW16G transport (IN) as the Master transport. For example, in cases where you will be using the AW transport to start/stop and locate measures. Set SEQ CTRL to IN.

AW16G 'TEMPO MAP' IN ACTION

The AW16G was built from the ground up with the musician in mind. The TEMPO MAP and the way the clock is structured 'speaks' a language musicians understand. If you were to join a band and they told you that 00h:01m:04.418 seconds into the tune you go to the Bridge, as a musician this would be confusing and a meaningless command. If, however, they tell you that at measure 33 you go to the Bridge you feel much more comfortable because, without counting, a musician has a sense of 4, 8, 12, 16 measures depending on the form of the tune that makes this a breeze. So the AW16G speaks many different kinds of clock. It can tell you the ABSOLUTE time from the beginning of the recording. It can tell you the RELATIVE time from some designated point you select to be the musical START time. It can tell you how many hours, minutes, seconds, and frames of visuals have gone by if you are working with video/film. It can tell how much clock time has passed to get to any position within the song. It can tell you how much time remains on your drive. And it speaks in a time reference that musicians love: Measures and Beats. The TEMPO MAP contains Time Signature and TEMPO (BPM beats per minute) events and will control the metronome events.

Additionally, the TEMPO MAP can do useful things for you, like recall entire snapshots of all the settings (called a SCENE). SCENES on the AW16G behave the same as Program Changes on the Motif – here they let you re-set the entire MIX on the AW16G. You can use Scenes to mute tracks, change pan position, change fader position, recall different effect setups, etc., etc. It is the audio world's Program Change. Scene Events can be recalled by the AW16G's own TEMPO MAP or recalled via MIDI registered in a track in the Motif. You have your choice.

[2] MMC control OUT is only available when the Motif is slaved to MTC. It is a convenient way to remotely control the AW when using MTC synchronization. The Motif only generates the MMC control commands when a slave to MTC. The Device numbers must match for MMC messages to be properly sent/received.

This is a type of snapshot automation. The AW16G is self-sufficient when it comes to SCENE recalls via the TEMPO MAP. (It is continuous fader movements and effect-send level changes that really need to be recorded to the external sequencer).

In addition to its other functions the TEMPO MAP can also automate what audio is on the four Sample PADS. The Sample Pads can be used to hold audio clips – things that you do not want to dedicate an entire track to – or for QUICK LOOPS. The four audio channels for the pads are each stereo channels and have all the EQ and dynamics that an input channel or track channel would have. So at maximum you can have four stereo PAD channels routed to the stereo bus simultaneously. Under each pad are four banks A, B, C, and D; you can house 16 sampled audio events on the PADS (up to a total of 44 seconds). The TEMPO MAP controls the way you automate what PAD bank is set to playback at anytime within the Song – a maximum of four Pads can be playing back at any one time. Data can be imported to the Pads from the hard disk, can be imported from any audio CD or imported as .wav files. You can record audio directly to the PADS. You can even extract data from any AW16G track. Quick Loop segments assigned to a PAD can be 1 measure loops and sliced to 8^{th} note, 16^{th} note or 1/8-note triplet values (12). The Quick Loop function is designed to take 1-measure phrases and allow you to time stretch them via the SLICE function. However, you can record audio phrases of any length (up to a max of 44sec total) and trigger them manually and record the triggers to a special PAD TRACK. It is important to understand this about the PADS and the PAD TRACK: The PADS themselves are used to trigger the playback of the audio they are pointing to. If you change the audio assigned to the PAD the results will change accordingly. When you place the PAD TRACK in RECORD you are recording **when** you touch a pad (not the audio) much like a MIDI sequence track in the Motif records (not the audio) but the MIDI note-on triggers that cause the audio to playback. When the PAD TRACK plays back, like a MIDI track, it triggers the audio data with a 'note-on' event. Samples on PADS can be made to play as ONE SHOT, or as a LOOP. They can GATE (stop when you let go like a keyboard) or TRIGGER (play all the way through with a single touch like a drum trigger). They can play forward (NORMAL) or backwards (REVERSE).

Setting up to record an Automated Mix

Automation mixdown events for the AW16G tracks can be stored in the Motif sequencer. Set the AW16G MIDI page so that you are transmitting (TX) MIDI data on a specific MIDI channel (for our example we will use track 16). Set the Program Change parameter on the AW16G to "TX" (transmit) if you are going to record SCENE events to the sequencer. Set the Control Change mode to MODE 3 (this will setup for TRACK Channel automation, as opposed to Mode 2 - which is for INPUT Channel automation). Setup the Motif to record the data to an empty track. When slaving the Motif to arm the recorder simply hit the RECORD button. The unit will start when you start playback of the AW16G.

Rather than inputting SCENE events onto the TEMPO MAP, you can record/place the AW SCENE events to the Motif's sequencer as Program Change events. Each SCENE EVENT is assigned a Program Change number. All Fader moves, send levels, PAN moves, and track mutes can be sent as MIDI control change events to the Motif sequencer. During the MIXDOWN process you can automate your moves. SCENES will take care of radical, immediate changes, such as which effect is assigned, which tracks are active or muted, while fader movements and pan position sweeps - continuous gestures - will be recorded/played back as control change events within the sequence data.

In order to playback the MIX data from the Motif sequencer to the AW16G, you will simply need to set the AW16G up to receive (RX) the data on the designated channel and to receive (RX) Program Change events (SCENE).

Warnings:
-Be careful not to duplicate events in the TEMPO MAP **and** the external sequencer. If you are using the TEMPO MAP to recall AW16G Scene events do not duplicate your events by then recording them out to the external sequencer (and compound it by playing them both back). You can select what data you are going to transmit or receive on the AW16G – for example, you can choose not to receive Program Change events or you could select not to transmit them in the first place.

Setting up the AW16G as a REMOTE CONTROL SURFACE

Yet another use for the AW16/Motif Studio is using the front panel of the AW16G to remotely control events of the Motif sequencer.

When you select REMOTE mode on the AW16G, its front panel buttons and faders no longer control the audio tracks of the AW16G. They now control the Motif and their movement can be documented into the Motif sequencer. You can mute tracks, change volume, assign faders to control pan position, effect sends, filter cutoff, envelope control, etc., etc. The Motif can be placed in OVERDUB Record, selecting MULTI as the Record Track will let you record your changes into the Motif sequence on all tracks simultaneously. There is a terrific LEARN function that lets you quickly assign any function to a Switch or Fader when you select the USER layer of the REMOTE section. You press the LEARN button on the AW16G and move the control on the Motif and you have assigned that function. It is that easy. If you want to assign a fader to control PAN. You move the AW16 FADER, press LEARN, move the PAN Control Knob on the Motif and it is done. The fader now is a PAN control for that MIDI channel. If you ever need to add fade ins or fade outs of specific tracks or want to control filter sweeps you can use the sliders and switches of the AW16G to record control data into the Motif.

When you go to REMOTE on the AW16G you will see templates. The VOLUME layer will work. The way that the CHANNEL selection works is this:
1-16 the faders are assigned as written on the front panel (with 9/10, 11/12, 13/14, and 15/16 paired).
1-12 the faders are individual for the range.
9-16 the first 8 faders become individual 9-16

Set 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 AW16G SONG at the start of a session.

- Press the [SONG] button and select the LIST screen
- Cursor to the "NEW" 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[3] 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]
- Many people will use the [SOUND CLIP] function to tryout some ideas. This is particularly useful if you play an acoustic instrument and want to quickly put down an idea. Either way, we need to set up the Metronome function.
- Metronome: You can set the metronome by pressing the [TRACK] button and selecting the 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 Motif for all recording, if you wish.
- Set the TEMPO MAP. Press the [SONG] button until you select the TEMPO screen. Here the first event (STEP) is already placed. Input the time signature and BPM of the song you are getting ready to record. (Later you can input which PADS are active and what SCENE you want to recall). You cannot remove this "STEP 01" event. What you can do is affect where it thinks "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 AW16G begins to generate MIDI clock (or MTC) for controlling the connected slave devices.
- Under the [SONG] button select the POINT screen and select the "LOCATOR" function. This will show you a list of key points within the recording. You will see RELATIVE, START, END, Marker A, Marker B, LAST REC IN, LAST REC OUT, etc., time reference points of the SONG. Move the cursor to the 'seconds' position next to the "START" time: **Hrs:Min:Sec.fractions:** 00:00:**00.**00.

[3] This is part of the LIBRARY function of the AW16G. Much of the setup work that you do can be named and stored in a Library, then recalled when necessary into another session

[The fractions can be fractions of a second or frames depending on the clock display you have selected.]

As you begin to move the Data Wheel to input a new start time the screen will prompt you “CHANGE START POINT?” Select OK. Moving the start point will affect all the other points appropriately. As you increase the seconds you will see the BEAT counter start counting back according to your selected time signature. 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 beats of lead-in you are creating. If you want a two measure count-in let it count back from 4 (4-3-2-1, 4-3-2-1,4) at least two complete times.

PLAN AHEAD…

An important part of music production on the AW16G/Motif Studio 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 Motif as a 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 AW16G as an audio track. This is only one of many possible scenarios. You might never commit your Motif tracks to audio. Instead you could use the AW16G audio 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 the sense that the Motif (and other MIDI modules) will run along side the AW16G audio tracks in perfect synchronization. One of the main strengths of MIDI is that it is repeatable time and time again without varying. The AW16G 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). 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. 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.

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