Garfield Electronics

Mini Doc

THE MINI DOC SYNCHRONIZER

OPERATION MANUAL

P.O. BOX 1941 Burbank, CA 91507 (818) 840-8939

TABLE OF CONTENTS

INTRODUCTION

The Mini Doc is a general purpose synchronizer for computerized musical instruments. Mini Doc simultaneously coordinates timing for sequencers, drum machines, and arpeggiators from Roland, Oberheim, Sequential Circuits, Linn, Korg, Moog, Emu, Synclavier, Fairlight, Simmons, Wave PPG, and MXR. Mini Doc's two independent clock circuits control arpeggiators in 22 synchronized rhythms. Mini Doc also generates individual triggers from audio. Synthesizer Gate, VCF, VCA, Filter, and Amplifier inputs are controlled in sync through Mini Doc's clock and trigger outputs. With Mini Doc all instruments sync to tape. Inputs, outputs, and controls are "front panel" and Mini Doc mounts in the standard 19" EIA rack.

INTERFACING SEQUENCERS AND DRUM MACHINES

Sequencers and drum machines are controlled through their clock inputs by connection to the appropriate jack in the Mini Doc OUTPUT section. The Mini Doc is in turn controlled by connecting the clock or sync output of the desired master unit to any one of the five jacks in its INPUT section.

The numbers under jacks in the INPUT and OUTPUT sections of the Mini Doc refer to the timebase associated with each jack. Timebase means "clocks per beat". For example, timebase 48 means that for any given tempo there are 48 clock waveforms produced per each beat of music.

The various timebases which pertain to different brands f instruments are:

SYNC Roland Korg	12 Step programmed sequences	
24 Drumulator MXR Drum MemoryMoog Plus	48 Linn Simmons	96 Oberheim
64 Wave PPG	384 Fairlight	VARIABLE Synclavier Emulator Polysequencer

A list of the timebase of each machine is also listed on the t[illegible] of the Mini Doc.

The Synclavier is interfaced by connecting its External [illegible] Input jack to a quarter note output from either of the Mini [illegible] Clock Channels.

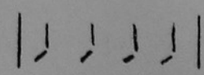
The Fairlight contains three sequencers which are cont[illegible] ed through the 384 OUTPUT jack. If using MCL or Page 9 se[illegible] "B" equal to 192.

To interface the Wave PPG sequencer, connect the Mini D[illegible] 64 OUTPUT jack to the 5 pin DIN jack on the Wave. It w[illegible] e necessary to build an adapter cable. Pin 2 is ground, Pin [illegible] the clock input.

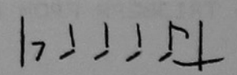
The interfacing of the Emulator and Polysequencer are covered in the sections on Real Time and Step programming. When using the Emulator as master, connect to the 48 INPUT jack. When using the Polysequencer as master, use the 96 INPUT jack.

INTERFACING ARPEGGIATORS

Mini Doc's two CLOCK CHANNELS control arpeggiators in 22 selectable rhythms. Each channel's ROTARY switch selects between eleven clocking rates ranging from whole note to 32nd note with triplet values indicated with a "T". Each INVERT switch has the effect of offsetting a channel's selected rhythm by half its value. Thus, quarter notes would be offset by an eighth note:



Regular



Inverted

The INVERT switch in conjunction with the ROTARY switch provides for 22 possible rhythms. When both channels are used to drive arpeggiators, (or on an overdub in multi track recording), the invert function can be used to make the two arpeggiators play in rhythmic opposition to one another. This is an effect similar to the Rhodes Stereo Vibrato, except that it operates on arpeggiators, and is in sync with drum machines and sequencers connected to the Mini Doc.

The INVERT switch also has the effect of reversing the polarity of the clock waveform. When in the down position, the channel's output is normalized to a rising edge arpeggiator. For falling edge arpeggiators, such as those contained in the MemoryMoog and Korg Poly 61, the normal position of the INVERT switch is up.

INTERFACING GATE, VCF, VCA, AND PEDAL INPUTS

Either of the Mini Doc CLOCK CHANNELS can be used on synthesizer Gate inputs to trigger the internal ADSRs in sync. The CLOCK CHANNELS can also provide a synchronized square wave modulation source for VCF, VCA, FILTER, and AMPLIFIER inputs on synthesizers. This includes the Roland GR150 and GR300 guitar synthesizers. All of these inputs can also be controlled by the individual triggers which the Mini Doc can generate from audio sources. When controlling the Gate input on a Prophet 5, patch the CV IN jack to the CV OUT jack to make the pitch of the synthesizer follow the notes played on its keyboard.

CREATING TRIGGERS FROM AUDIO

Connect the drum or other audio, direct or from tape, to the 96 INPUT jack. Turn the CHANNEL ONE ROTARY switch to the "1" position. Connect the CHANNEL ONE OUT jack to the desired individual trigger input on Linn, Oberheim, Emu, or MXR drums, the clock input on arpeggiators, Gate or Pedal inputs on synthesizers. Set the INVERT switch as required by the instrument being triggered. Adjust the level of the input audio for compatibility. The use of this function to step program a sequencer is described in the Step Programming section of this manual. CHANNEL TWO can also be used to create triggers.

ADDITIONAL FUNCTIONS

The jack labelled START provides momentary open to ground transitions which can be used to automatically reset instruments which provide for the use of a Start/Stop footswitch, such as the Drumulator, DSX, DMX, DX, LinnDrum, and MXR drum. Units controlled through the START jack should initially be placed in Stop mode to correctly polarize the operation of this function.

The jack labelled CLICK provides a quarter note metronome click when the Mini Doc is in operation. It is used as a reference when recording Real Time sequences as described under REAL TIME PROGRAMMING.

SYNC TO TAPE

With Mini Doc, all instruments sync to tape, allowing nearly as many synchronized overdubs to be recorded as there are channels on the recorder used. The "nearly" is that one channel must be used to record a "sync track", which is used as a common reference clock for each overdubbed part.

The sync track is created simply by recording the clock out of any one sequencer or drum machine on a tape track, with the exception of Oberheim and Polysequencer clocks. To make a sync track from either of these sources, plug it into the Mini Doc 96 INPUT jack, then connect the 96 OUTPUT jack to the tape channel input. The Polysequencer clock is accessed by plugging very lightly into its external clock input jack, so as to just touch the jack contact. To record the clock from Roland machines equipt with the 5 pin DIN jack, connect to the Mini Doc INPUT DIN jack. Then patch the 24 OUTPUT jack to a tape track.

Record the sync track longer than you need, in case the length of the song is extended later. A sync track should be recorded on either the first or last track of the equipment being used to obtain maximum isolation. Record sync tracks at -5 VU.

To use the sync track connect it to the appropriate jack in the Mini Doc INPUT section. Connect the clock inputs of sequencers, drum machines, or arpeggiators to be controlled to the appropriate Mini Doc OUTPUT jacks, and place all machines in their Play modes. Connect instrument audio outputs to the tape channels to be recorded. Avoid recording synchronized parts on the tape channel adjacent to the sync track as this can cause feedback problems. Play the tape from a point a few seconds before the code begins. When the code starts, connected instruments will play.

For overdubs, rewind the tape, patch the instrument outputs to the new channels to be recorded, place instruments in their Play modes and start the tape as before. It's as simple as that.

If problems are encountered, try changing interconnection cables. If the problem persists, listen for glitches or drop outs in the sync track. In the case of glitches, try recording over. If drop outs are found, try cleaning the heads, recording the sync track on another channel, or changing tape. Also, check that the playback level of the sync track has not dropped radically from -5 VU.

A sync track can also be created by connecting a square wave synthesizer output to the 96 INPUT jack and recording the 96 OUTPUT. Adjust the pitch of the square wave while listening to the Mini Doc's CLICK output to set the tempo. The G below middle C will produce approximately 120 beats per minute. This is a good way to generate a sync track when arpeggiators are to be overdubbed and drum machines or sequencers are not being used.

To make a Mini Doc compatible sync track from an existing Roland sync track, record the Roland clock out while the unit is being driven from the original sync track.

PROGRAMMING REAL TIME SEQUENCES

Sequences can be recorded in Real Time or by Step. To record a Real Time sequence on an Emulator, connect the Emulator clock out to the Mini Doc 48 INPUT jack. Connect the Mini Doc CLICK jack to an audio feed. Put the sequencer in its Record mode. Adjust the speed control on the Emulator to obtain the desired click rate from the Mini Doc CLICK OUT. Next, play the desired sequence. End the sequence on the beat by pressing the sequencer's Stop button.

If the Emulator is to be the Mini Doc's master, connect its clock out to the 48 INPUT jack, the Emulator and instruments connected to the Mini Doc outputs will play in sync when the Emulator is started. If using an instrument other than the Emulator as the master, connect the Mini Doc 48 OUTPUT to the Emulator's Clock Input and put the sequencer into Play mode. When the Mini Doc's master is started, the sequence will play back in sync with other connected units.

Real Time programming of the Polysequencer is identical to that for the Emulator, except that the 96 INPUT and OUTPUT jacks are used instead of the 48.

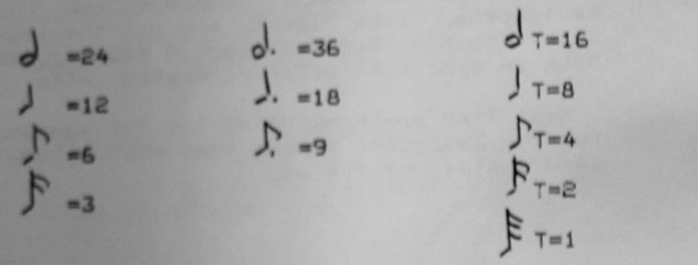
STEP PROGRAMMING A SEQUENCE

In recording Step programmed sequences, calculated numbers of clock pulses are individually assigned to each note or rest of the sequence, resulting in precise rhythm upon playback. The Roland CSQ600, Emu Emulator, and Sequential Circuits Polysequencer and Pro One can all be programmed this way. Each of these instruments has internal means to generate the clock pulses for Step programming, except the Emulator. To Step program the Emulator clock pulses must be provided externally. Program a loud sound of short duration on another synthesizer and connect it to the 96 INPUT on the Mini Doc. The output of a drum machine which can be triggered by hand will also suffice for this purpose. In either case, each time a sound is presented at the 96 INPUT jack, a trigger will result at either Mini Doc CHANNEL OUT. That trigger source should be connected to the Clock input on the Emulator. Step programming can now be accomplished. The channel LEDs will flash with each trigger produced.

STEP PROGRAMMING IN TIMEBASE 12 AND OTHER TIMEBASES

Recall that the term Timebase refers to the number of clock pulses which are to advance the music by one beat. 12 is most often the best choice of timebase for step programming operations since it can provide adequate rhythmic resolution for most sequences. In timebase 12, rhythmic values are assigned step counts as shown in the following table:

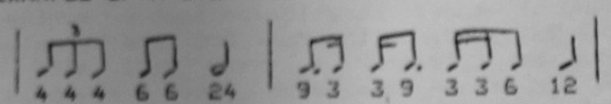
TIMEBASE 12 STEP COUNT TABLE



T=Triplet

One way to record a step program is to write the rhythmic pattern to be entered in notation, and then add the step count numbers above or below each of the notes. The sequence is then recorded by holding each note of the sequence on the synthesizer keyboard and then counting in the appropriate number of steps using the step switch on the sequencer or, in the case of Step programming an Emulator, the auxiliary keyboard or drum machine key.

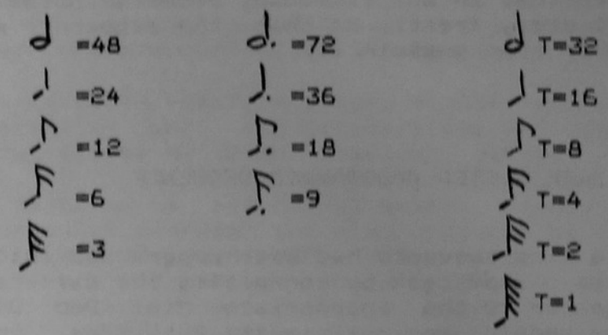
EXAMPLE OF A STEP COUNT GUIDE IN TIMEBASE 12



After the sequence has been recorded, it is possible to check that the right number of steps has been recorded for each note by putting the sequencer into play mode and then using the auxillary stepping means to advance the program step by step, observing that the number of steps between notes corresponds to the rhythmic value desired. Note that some sequencers will automatically enter the first step when a note is depressed. Sometimes this happens only on the first note of the sequence, (older Emulator software), and other times on each note of the sequence, (Sequential Circuits Model 800).

Step programming in higher timebases such as 24 allow greater rhythmic resolution since thirty-second notes and dotted sixteenth notes become available.

TIMEBASE 24 STEP COUNT TABLE

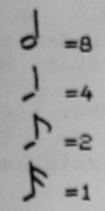


T=Triplet

Unless entering a sequence which requires these smaller rhythmic values, it is best to avoid timebase 24 since the actual number of steps to be entered for the sequence is double the number used for timebase 12 programming.

In cases where the rhythmic resolution of a sequence is very limited, say quarter and eighth notes only, consider using a timebase such as 4 in order to save time in the programming cycle.

TIMEBASE 4 STEP COUNT TABLE



Remember that in any timebase, repeated notes must be separated by a null step, (rest), so that the sequencer will retrigger the note rather than sustain it.

PLAYING BACK A STEP PROGRAMMED SEQUENCE

After a step sequence has been programmed into the sequencer, it can be played back by connecting the external clock input of the sequencer to the appropriate Mini Doc OUTPUT jack. The sequencer should be put in its Play mode. When the Mini Doc's master unit is started the sequence will playback in sync with other instruments connected to the Mini Doc.

FUNCTIONAL DESCRIPTION

INPUTS will respond to clock voltages from 300mV to 5V. Timebase 12, 24, 48, 96, or DIN sync, direct from clock outputs or from tape sync tracks, can be used to master the Mini Doc. For proper operation, plug into no more than one of the INPUT jacks at a time. All inputs operate over a tempo range of 40 to 230 beats per minute, with the exception of the timebase 12 input which will go as low as 60 beats per minute.

OUTPUTS are all 5V and have sufficient drive to run multiple devices from each jack. Use "Y" adapters as needed. Timebase 12, 24, 48, 96, 64, 384, and DIN sync are produced. Sequencers and drum machines are controlled through these jacks.

CHANNELS provide whole, half, quarter, eighth, and sixteenth note clocking values in duple and triple time, and 32nd notes. The timebase equivalents of these notational values are .25, .375, .5, .75, 1, 1.5, 2, 3, 4, 6, and 8. The operating rhythm of a channel is selected by its ROTARY switch. Individual triggers derived from audio sources are also produced by the channels. Arpeggiator, Gate, Trigger, VCF, VCA, Filter, and Amplifier inputs are controlled through these jacks. INVERT switches offset the rhythm selected by a channel ROTARY switch for syncopation. INVERT switches also reverse the output polarity of a channel for compatibility with rising or falling edge triggered devices. The channel outputs are 5V square waves.

START produces a momentary open to ground transition when the Mini Doc starts or stops and can simultaneously control multiple Start/Stop footswitch inputs.

CLICK is a 5V quarter note metronome click of 1K impedance used as an audio reference when recording Real Time sequences.

WARRANTY

This unit is warranted against defects in the areas of parts and manufacture for a period of one year from the date of receipt. Warranty becomes void if in the opinion of Garfield Electronics the unit has been subjected to unauthorized service, modification, or senseless fooling around. No liability is assumed by Garfield Electronics for any loss or damage, direct or indirect, resulting from the use of or inability to use this unit.

Garfield Electronics