RETROAKTIV

MPG-70

OWNER'S MANUAL

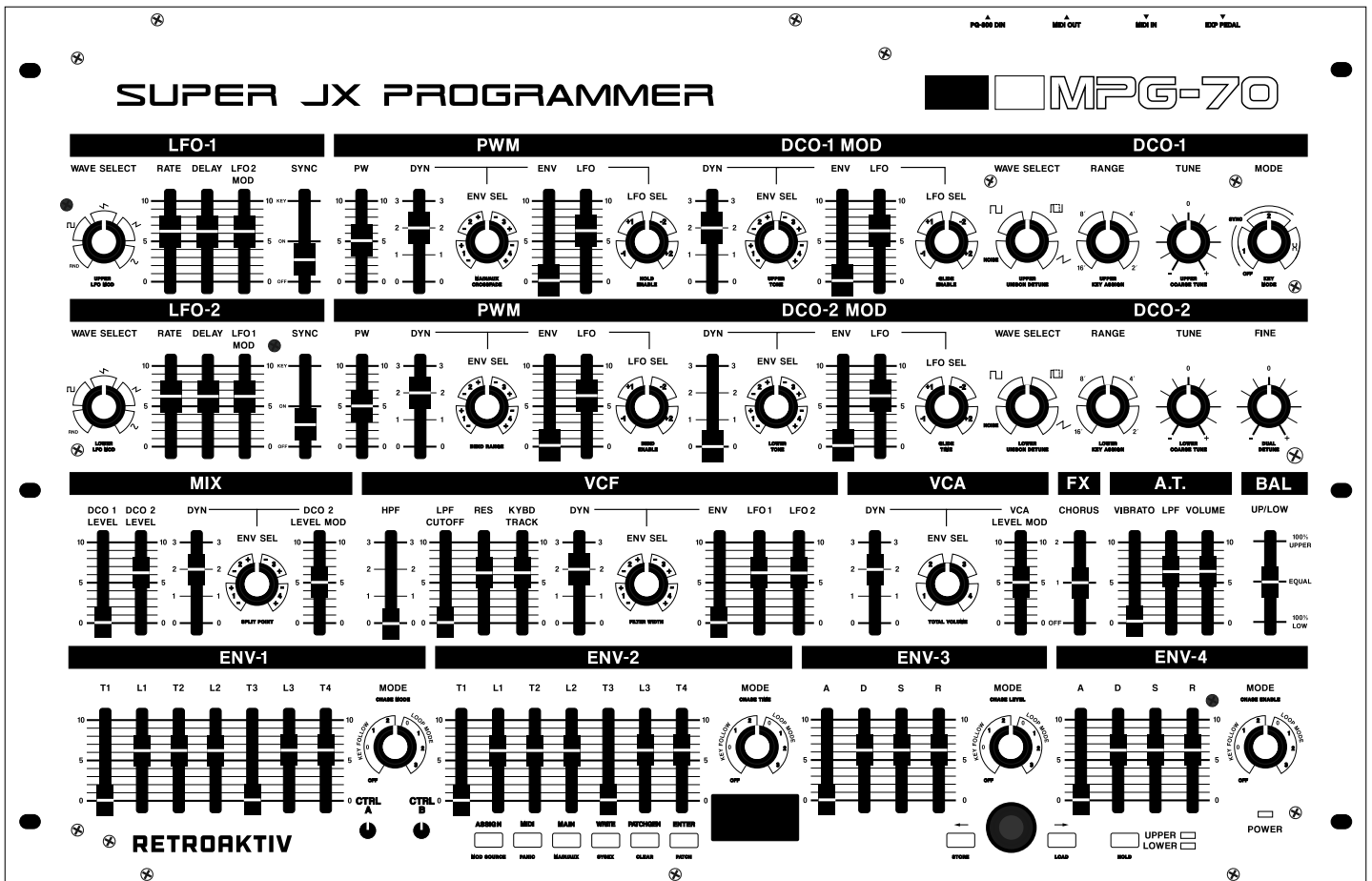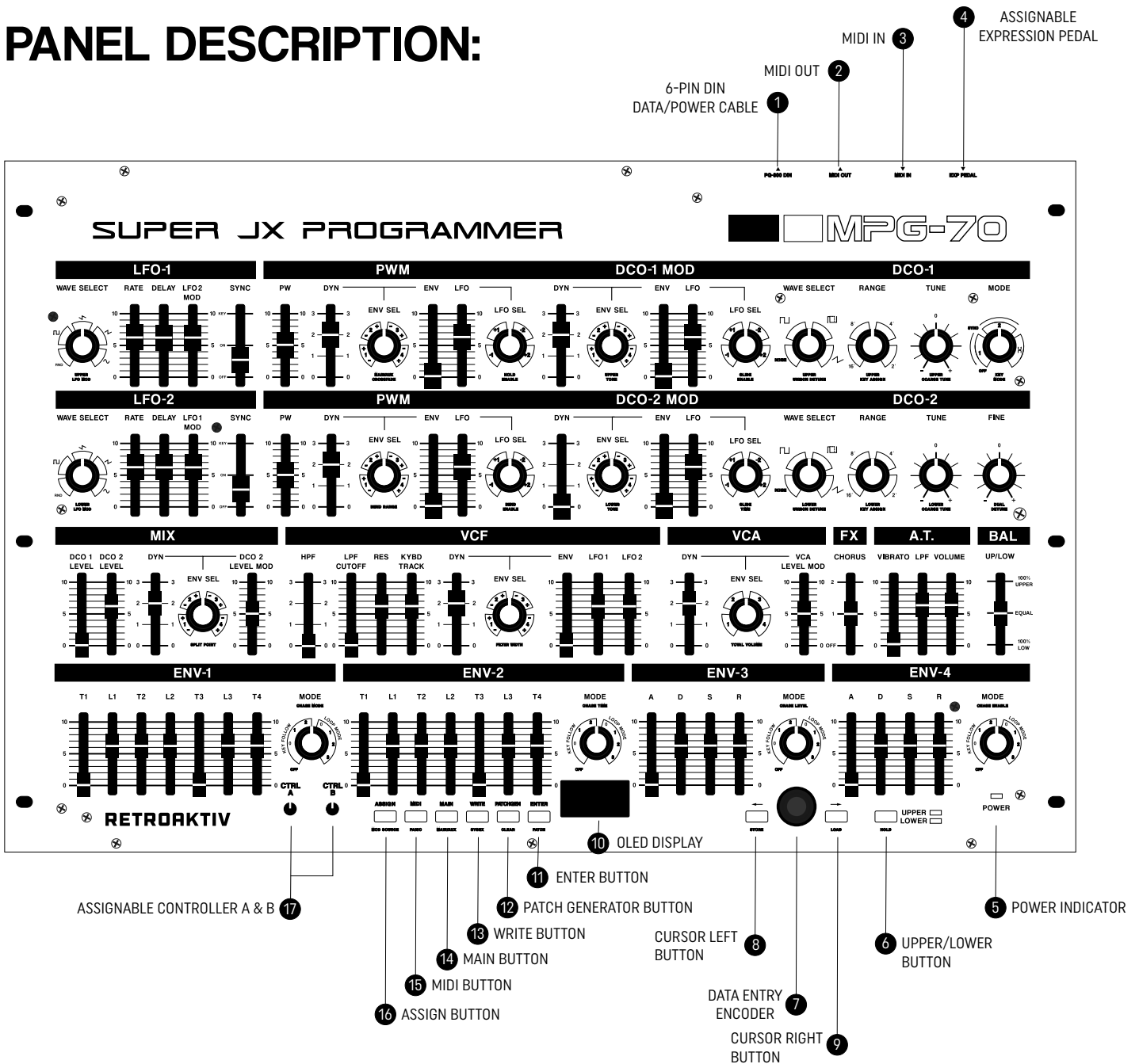SUPER JX PROGRAMMER   MPG-70

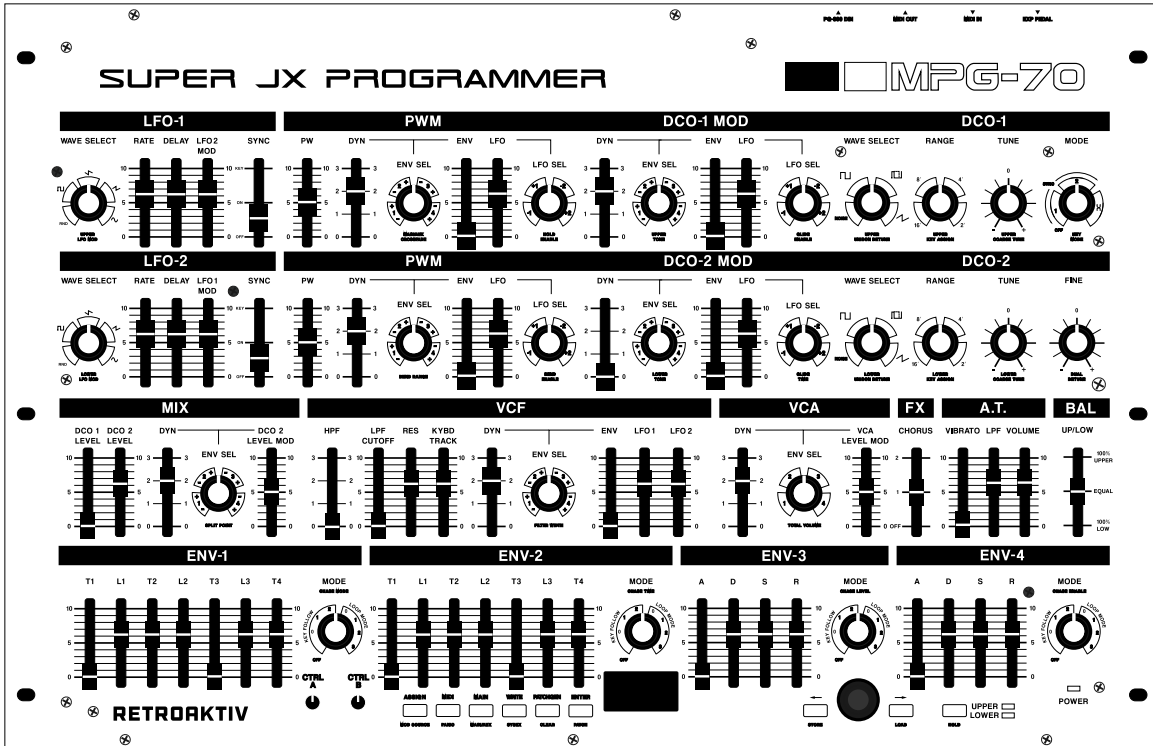For mkI, mkII, and mkIII Firmware 3.0+

FEATURES

• MPG-70 allows full integration of JX-8P, MKS-70, and Super JX synthesizers into modern DAW setups. The controller acts as a brand new operating system for the synth, giving users full control over automation, object storage, and layering.

• Store any tone, patch, or setup with a single press of a button. We've eliminated the TONE/TONE/PATCH architecture found on the original MKS-70/SJX. Now you can save your sounds quickly without the hassle of linking tones with the patch menu.

• Multi-unit Poly Mode allows users who own two of the same synthesizer (And it can be any synth, not just a JX!) to daisy chain them and double the polyphony. This will turn 2 MKS-70s into a 24-voice polyphonic synth!

• Any parameter on the synth can now be controlled using any CC, an expression pedal, or aftertouch. The powerful ASSIGN modulation matrix found on all Retroaktiv controllers lets users create custom complex modulation settings in seconds flat. Want the filter to sweep from 50% to 60% while the resonance sweeps from 40% to 0? MPG-70 has you covered!

• Create an INIT tone at any time from the front panel. No more wasted time "zeroing" all of the panel parameters. One button press and a new tone is initialized and ready for you to create!

• MPG-70 allows full integration of JX-8P, MKS-70, and Super JX synthesizers into modern DAW setups. The controller acts as a brand new operating system for the synth, giving users full control over automation, object storage, and layering.

• MPG-70 can speak 11 different synth protocols, which allows it to communicate with any stock or Vecoven synth using CC's, sysex, or PG-800 communication protocol. Stored MPG-70 patches will work across all models!

• MPG-70 can upload and download banks and individual patches from any compatible synth, allowing easy transfer of objects to and from the MPG-70's internal memory banks.

• MPG-70 has a full featured patch generator, which can generate gorgeous patches of many different types. Users can choose from basses, pads, polysynths, strings, brass, bells, pianos, and organs, and the MPG-70 will never generate the same patch twice. The patch generator can also intelligently layer UPPER and LOWER voice boards, to generate even more sophisticated sounds if being used with a Super JX or MKS-70.

• All patch and tone parameters are immediately accessible from the front panel, without any menu diving.

• Control combinations of any 2 JX-8P, MKS-70, or Super JX units independently. The states of both synths can be stored as a SETUP, allowing users to create large multitimbral textures.

• MPG-70 memory can be backed up directly to a computer, which eliminates the need to use external librarians to backup your objects.

• MPG-70 can be easily updated via MIDI whever Retroaktiv issues a new software update with new features.

• OLED screen displays critical information such as waveforms and envelope shapes, and allows users to easily navigate the menu system

PANEL DESCRIPTION:

SUPER JX PROGRAMMER   MPG-70

6-PIN DIN DATA/POWER CABLE — 1
MIDI OUT — 2
MIDI IN — 3
4 — ASSIGNABLE EXPRESSION PEDAL

RETROAKTIV

17 — ASSIGNABLE CONTROLLER A & B
16 — ASSIGN BUTTON
15 — MIDI BUTTON
14 — MAIN BUTTON
13 — WRITE BUTTON
12 — PATCH GENERATOR BUTTON
11 — ENTER BUTTON
10 — OLED DISPLAY
8 — CURSOR LEFT BUTTON
7 — DATA ENTRY ENCODER
9 — CURSOR RIGHT BUTTON
6 — UPPER/LOWER BUTTON
5 — POWER INDICATOR

FRONT PANEL

OLED DISPLAY

The OLED display presents information about the operation being performed.

SECOND FUNCTIONS (PATCH)

The second functions are labeled on the front panel in blue, underneath the control used to access them. To access a second function, hold SHIFT while using the control. All patch menu functions (In blue under rotary pots) are accessed by holding SHIFT and moving the pot.

UPPER & LOWER BUTTON

Use this button to select which layer is being edited. UPPER and LOWER LEDs indicate which layer is currently selected.

CTRL A & CTRL B

These knobs control ASSIGN A and ASSIGN B, which cab be used to control combinations of different parameters as specified by the user. See the ASSIGN section in the manual for more details.

MENU NAVIGATION BUTTONS

The menu navigation buttons are used to select editor pages in the MPG-70. The [LEFT] and [RIGHT] buttons are used to move the cursor in the menu pages.
The [ENTER] button is used to execute a variety of operations within a menu.
[MIDI], [PATCHGEN], [MAIN], and [ASSIGN] buttons are used to navigate to their respective menu pages.

JACKS & POWER

The MPG-70 is powered via the 6-pin PG-800 jack. Use the included 6P DIN cable with the synth or a Retroaktiv wall supply to power MPG-70. MIDI ports and expression pedal jacks are located on the rear panel.

ENCODER/SHIFT

The black encoder knob located directly under the OLED is used to modify values of the currently selected parameter. If you hold down the encoder [SHIFT], parameter values will change by larger increments.

QUICK START

To begin using your MPG-70, the settings on the MPG-70 and the synth must be correct. If incorrect settings are used, then the synth will not respond to data from MPG-70.   For the best user experience, we recommend using MIDI to edit the synth, and not PG-800, as PG-800 protocol does not allow editing of PATCH MENU parameters or UPPER/LOWER selection. The simplest setup is shown below. Using this scheme, a MIDI keyboard sends note data to the MPG-70, which then gets routed to the synth, along with any MPG-70 controller data.


Basic MIDI configuration
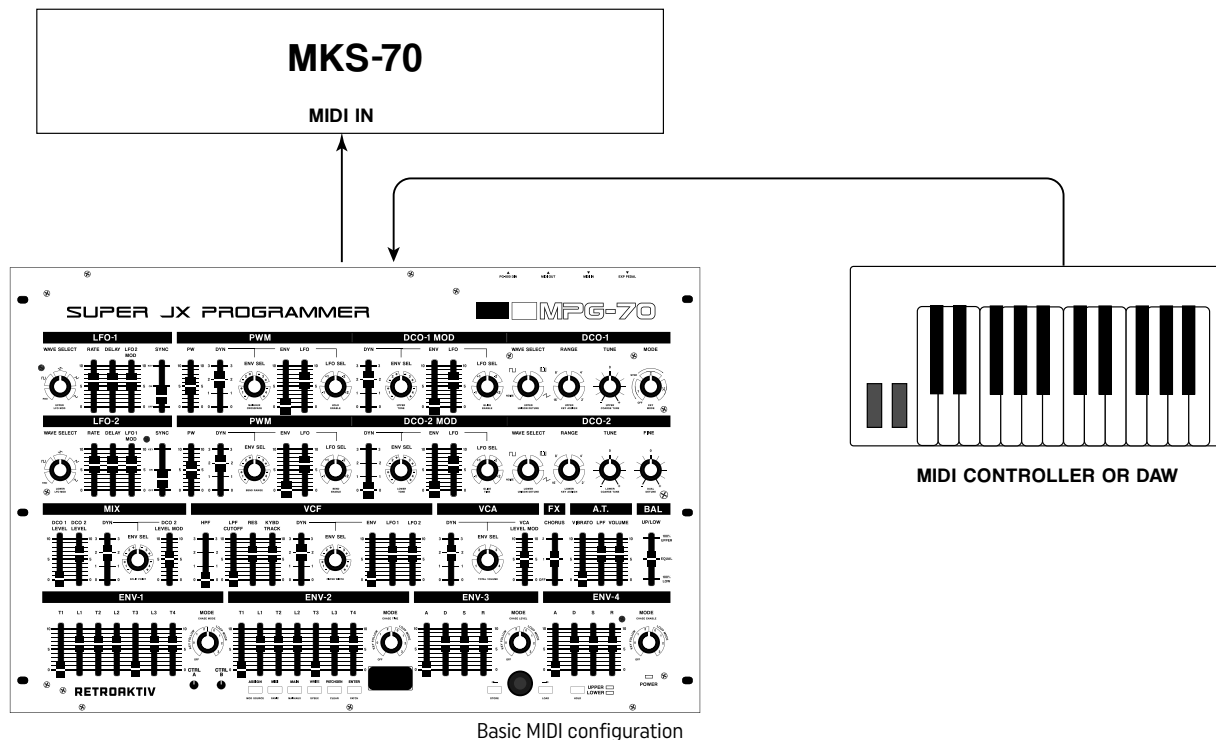
To begin making sound, let's start by creating a basic setup.   Press the [MIDI] button on MPG-70 and set the MPG-70 MIDI settings as shown below. Note that the U1 protocol must me set according to the synth being used. Refer to the diagram on the next page for the correct protocol setting for each synth type. Using the settings below, the synth must be set to receive SYSEX and the synth's MIDI channel must be set to channel 1.
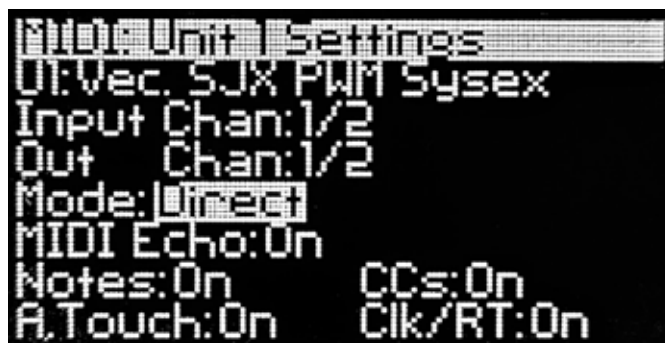
Basic MIDI menu settings on the MPG-70

An alternative connection scheme involves a MIDI MERGER unit. This allows for bidirectional communication between the synth and the MPG-70 (For exchanging objects like PATCHES, TONES, and BANKS). If using a MIDI MERGER, use the scheme pictured below.
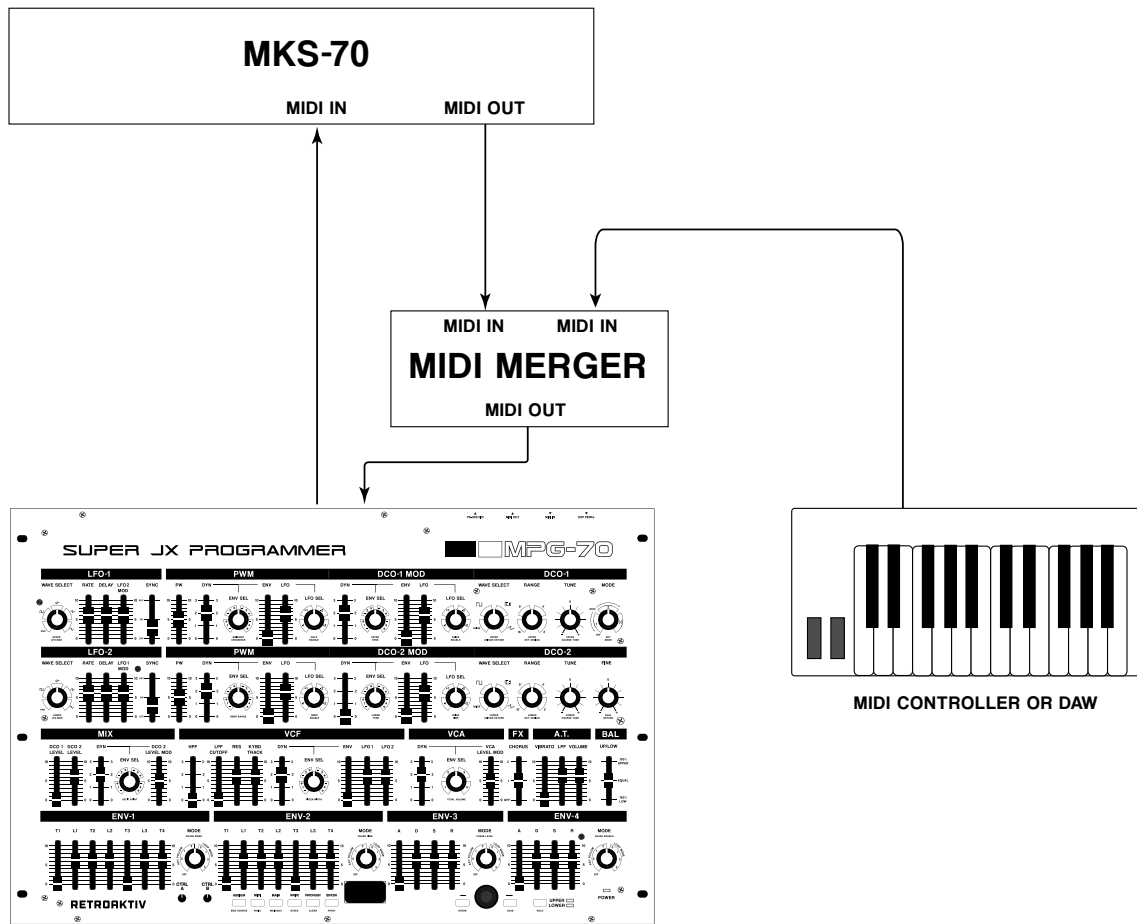
COMMUNICATIONS PROTOCOLS

In the MPG-70 MIDI Settings menus, the U1 and U2 settings must correspond to the synth being controlled. Incorrect settings here will result in no response from the synth when being edited. The 11 MPG-70 protocols are listed below.

SJX Sysex - Sysex protocol Super JX and MKS-70 synthesizers
JX-8P Sysex - Sysex protocol stock JX-8P synthesizers
SJX/JX-8P PG-800 - PG-800 protocol for stock JX-8P, MKS-70 and Super JX synthesizers
Vecoven SJX Sysex - Sysex protocol for Vecoven 3.x Super JX and MKS-70 synthesizers
Vecoven SJX PWM Sysex - Sysex protocol for Vecoven 4.x Super JX and MKS-70 synthesizers with PWM
Vecoven JX-8P Sysex - Sysex protocol for Vecoven 5.x JX-8P synthesizers
Vecoven JX-8P PWM Sysex - Sysex protocol for Vecoven 6.x JX-8P synthesizers with PWM
Vecoven SJX PG-800 - PG-800 protocol for synthesizers with Vecoven 3.x
Vecoven SJX PWM PG-800 - PG-800 protocol for synthesizers with Vecoven 4.x with PWM
Vecoven JX-8P PG-800 - PG-800 protocol for Vecoven 5.x JX-8P synthesizers
Vecoven JX-8P PWM PG-800 - PG-800 protocol for Vecoven 6.x JX-8P PWM synthesizers

USING THE INCORRECT PG-800 PROTOCOL WITH YOUR SYNTH CAN RESULT IN THE SYNTH MEMORY BEING ERASED. MAKE SURE THAT YOU ARE USING THE CORRECT COMMUNICATION PROTOCOL WITH YOUR SYNTH!

SETTINGS ON THE SYNTHESIZER

The settings on the synth's MIDI menu must be correct for communication to work. For a SUPER JX or MKS-70, the MIDI UPPER and LOWER channels should be the same, and must correspond to the channel settings on MPG-70. SYSEX IPR and SYSEX APR must be turned ON. On Vecoven modified units, the communication protocols for PG-800 (if used) and SYSEX (if used) must be activated.

FIRMWARE VERSION & MEMORY CARD

upon powering up the MPG-70, a splash screen will be displayed on the OLED. This splash screen will first display the firmware version currently running on MPG-70, and if a memory card is present, will display the status of the memory card.

If there is an issue with the memory card, the unit will boot with a message indicating the problem, and will give an error code. If this happens, please contact Retroaktiv for the error code diagnosis.

If using PG-800 protocol with a Vecoven PWM modified synth, the MPG-70 must handshake with the synth during the boot process. The splash screen will remain on the display until a successful handshake occurs, or the operation times out. If there is a time-out, then all extra Vecoven parameters, such as extra LFOs and ENVs will not respond.
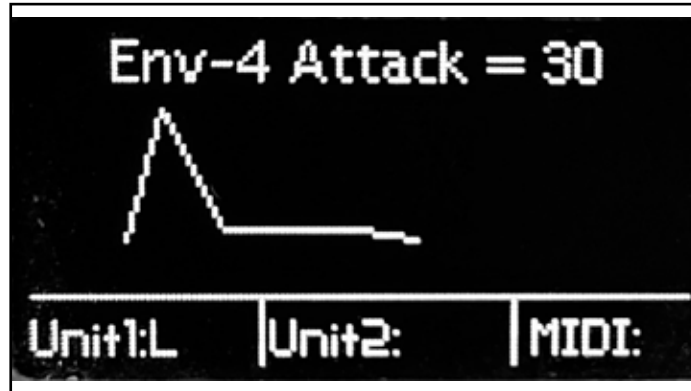

MPG-70 Splash Screen with firmware version

Memory Expansion OK indicates presence of a memory card

MENUS AND NAVIGATION

When MPG-70 boots up, it will display the MAIN menu screen. The diagram below shows the contents displayed on the MAIN screen.


MPG-70 MAIN Screen

The MAIN screen displays the following information:

1 - Current active parameter name and value

2 - Unit 1 Active Layers (U, L, or U+L if UPPER and LOWER layers are both selected)

3 - Unit 2 Active Layers (U, L, or U+L if UPPER and LOWER layers are both selected)

4 - MIDI Input Monitor - Displays channel of incoming MIDI activity received at MPG-70 MIDI IN port.

To return to the MAIN screen at any time, press the [MAIN] button in the navigation console.

The encoder and arrow buttons are used to navigate menus and change settings. The SHIFT function refers to the switch on the encoder knob. To engage the SHIFT function (used for double-button combos such as SHIFT+MIDI button = MIDI Panic), press and hold the encoder knob. To increment a value with the encoder, simply turn the encoder knob. To increment or decrement by 8, hold the SHIFT button in while turning the encoder.
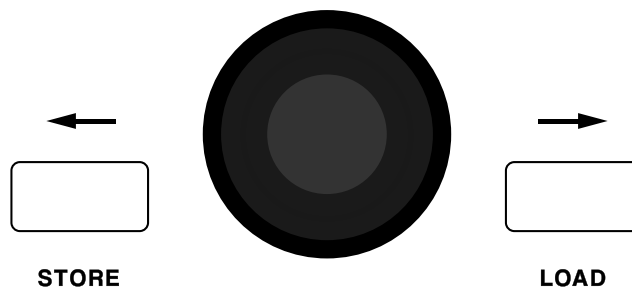

MPG-70 Navigation Console

Use the [MIDI], [PATCHGEN], [ASSIGN], and [MAIN] buttons to navigate to the different menu pages. To move the cursor on a menu page, use the [LEFT] and [RIGHT] buttons. To change the value of a highlighted menu setting, use the [ENCODER] dial.

THE FREEZE FUNCTION

Pressing WRITE from the MAIN screen will enable the "FREEZE" function on MPG-70. When FREEZE is enabled, a message will be displayed "Freeze : WRITE to send.". When FREEZE is on, moving a slider will not send a message. When ENTER is pressed, the new location of any slider moved during the FREEZE operation will be sent to the synth. This is an excellent way to send a large number of slider changes all at once, at the exact moment ENTER is pressed.
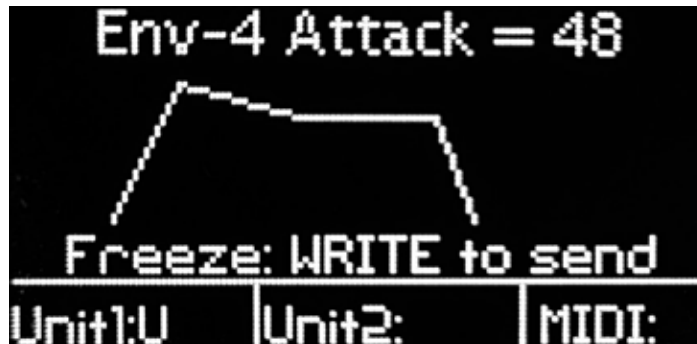
Freeze mode

MANUAL MODE

Pressing SHIFT + WRITE will transmit all of the control positions on the panel to the synth. When this is done, the settings on the synth will correspond to the current settings on the MPG-70 front panel.
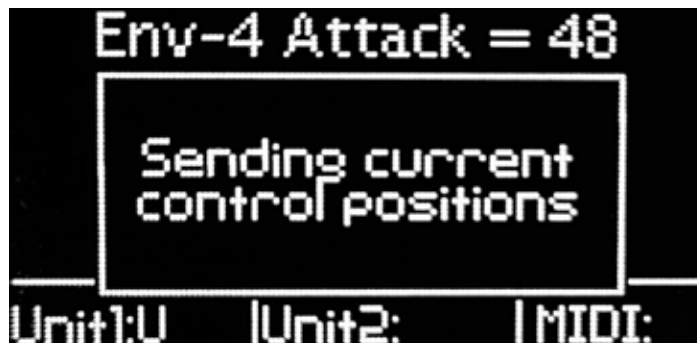
Manual Mode

INIT TONE

To create an INIT TONE (A generic tone that functions as a basic starting point when creating a new sound), press SHIFT + PATCHGEN.

THE MIDI MENUS AND FUNCTIONS

MIDI:SETTINGS

The MIDI Settings menu contains all of the parameters that determine which MIDI channels the MPG-70 receives data on, and which channels outgoing data will be transmitted on. This page is also where we configure which types of MIDI data the MPG-70 will pass to the synth, as well as CC to sysex translation.

Press MIDI once to navigate to the Unit 1 Settings page, and press MIDI again to navigate to the Unit 2 Settings page.

U1 & U2:

This is where the communication protocol for the synthesizer is selected. See page 6 for the list of available communication protocols.

INPUT CHAN:

Selects which MIDI input channels MPG-70 will respond to.   Only selected channels will be relayed to the synth (on the MIDI OUT channels selected), while all others will be ignored. Note that if 1/2 is selected, this means that MPG-70 will process any data received on channel 1, and if CC TRANSLATE is enabled, incoming CCs on channel 2 will also be processed. (Because when using CC TRANSLATE, 2 channels are used. One for the LOWER voice board, and one for the UPPER voice board. See MODE below for more details)
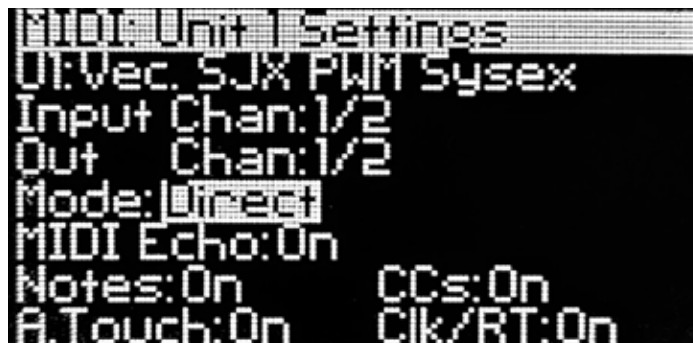
The MIDI:Settings Menu

OUT CHAN:

Selects the channel that outgoing SYSEX, NOTE, CC, PITCH, and AFTERTOUCH data will be transmitted on. Any data received on the INPUT CHANNEL will be passed to the synth on the OUTPUT CHANNEL. For example, if INPUT CHAN is set to 1/2, and OUT CHAN is set to 3/4, note data received by MPG-70 on channel 1 would be transmitted to the synth on channel 3. This function is a great way to prevent MIDI feedback loops, as any data received on channel 3 at the input, would be ignored and not passed to the synth. The synth should be set to receive on the same channel as the OUT CHAN setting.

MODE:

There are 2 selectable modes on the MPG-70: DIRECT and CC SEND/TRANSLATE.

DIRECT: Select this mode to send either SYSEX or PG-800 messages to the synthesizer.

CC SEND/TRANSLATE: Select this mode if recording CCs using a DAW or SEQUENCER. When using this mode, the panel controls will send a CC when toggled. This CC can be recorded by a DAW, and when sent back to the MPG-70, will be translated back into a SYSEX or PG-800 message and transmitted to the synthesizer. MPG-70 does not support NRPN CCs, as this would require several more protocols spanning all of the different Vecoven synthesizers. The CC method used by the MPG-70 is universal across all of the different supported synths, and will work with stock and Vecoven modifed units. For a list of CC parameter IDs, see the chart below.

MIDI ECHO:

When enabled, any valid MIDI message received on INPUT CHAN will be transmitted on the MIDI OUT port of the MPG-70 on the OUT CHAN. When disabled, date received on the MIDI IN port will be ignored.

DATA FILTERS:

Different types of MIDI data chan be filtered by the MPG-70. When a data type is set to ON, that data type will be passed through the MPG-70. NOTE, CC data, AFTERTOUCH, and CLOCK/REALTIME data can be filtered. If PITCH BEND or SYSEX needs to be filtered, this can be toggled on the synth itself.

CC TO SYSEX TRANSLATE

MPG-70 allows users to record and translate button presses and fader movements with any DAW or sequencer, by allowing CC to sysex translation.

When this mode is enabled, moving sliders and toggling button parameters will send a CC message from the MPG-70 instead of a sysex message.

When using the MPG-70 to translate CC messages into sysex messages for the MKS-70, each of the TONE layers on each UNIT has its own MIDI channel. For example if the UNIT 1 IN channel is set to 1(2), and the UNIT 2 IN channel is set to 3(4), then incoming CCs on channel 1 would affect UNIT 1 UPPER tone parameters, CCs on ch 2 would affect UNIT 1 LOWER tone parameters. CCs on channels 3 and 4, would affect UNIT 2 UPPER and LOWER layers respectively. This table shows the implementation of the MPG-70 MIDI CC to SYSEX translation.

3 DCO-1 WAVE SEL	31 DCO-2 ENV SEL	52 LFO-1 MOD	79 ENV-2 T1
9 DCO-1 RANGE	32 DCO-2 PW	53 LFO-1 SYNC	80 ENV-2 T1
12 DCO-1 COARSE	33 DCO-2 PW LFO AMT	54 CHORUS	81 ENV-2 T2
13 DCO-1 LFO AMT	34 DCO-2 PW LFO SEL	55 DCO-1 MIX	82 ENV-2 T3
14 DCO-1 LFO SEL	35 DCO-2 PW ENV DYN	56 DCO-2 MIX	83 ENV-2 T4
15 DCO-1 ENV AMT	36 DCO-2 ENV MOD AMT	57 MIX ENV DYN	84 ENV-2 L1
16 DCO-1 ENV DYN	37 DCO-2 PW ENV SEL	58 MIX ENV AMT	85 ENV-2 L2
17 DCO-1 ENV SEL	38 DCO MODE	59 MIX ENV SEL	86 ENV-2 L3
18 DCO-1 PW	39 DCO-2 FINE TUNE	60 LFO-2 WAVE SEL	87 ENV-2 MODE
19 DCO-1 PW LFO AMT	40 HPF	61 LFO-2 RATE	88 ENV-3 ATTACK
20 DCO-1 PW LFO SEL	41 LPF CUTOFF	62 LFO-2 DELAY	89 ENV-3 DECAY
21 DCO-1 PW ENV DYN	42 RESONANCE	63 LFO-2 MOD	90 ENV-3 SUSTAIN
22 DCO-1 PW ENV AMT	43 VCF LFO-1 AMT	70 LFO-2 SYNC	91 ENV-3 RELEASE
23 DCO-1 PW ENV SEL	44 VCF LFO-2 AMT	71 ENV-1 T1	92 ENV-3 MODE
24 DCO-2 WAVE SEL	45 VCF KEY FOLLOW	72 ENV-1 T2	93 ENV-4 ATTACK
25 DCO-2 RANGE	46 VCF ENV DYN	73 ENV-1 T3	94 ENV-4 DECAY
26 DCO-2 COARSE	47 VCF ENV AMT	74 ENV-1 T4	95 ENV-4 SUSTAIN
27 DCO-2 LFO AMT	48 VCF ENV SEL	75 ENV-1 L1	96 ENV-4 RELEASE
28 DCO-2 LFO SEL	49 LFO-1 WAVE SEL	76 ENV-1 L2	97 ENV-4 MODE
29 DCO-2 ENV DYN	50 LFO-1 RATE	77 ENV-1 L3	102 VCA ENV AMT
30 DCO-2 ENV AMT	51 LFO-1 DELAY	78 ENV-1 MODE	103 VCA ENV SEL
			104 VCA ENV DYN

MIDI: GLOBAL SETTINGS

The MIDI: Global Settings pages contain parameters that affect global settings on the MPG. To navigate to this menu page, press [MIDI] until the menu shown below is displayed on the OLED.


The MIDI: Global Settings page

MULTI-UNIT POLY MODE:

Multi-Unit Poly Mode mode is for setups that utilize two MKS-70 synthesizer modules, or two of any other synthesizer (Not just synths supported by MPG-70). When enabled, this will treat 2 identical synths as a single synthesizer with double the polyphony.

It is important to understand that when Multi-Unit Poly Mode is enabled, the MPG-70 will consider the 2 connected MKS-70s to be a single 24-voice polyphonic synth. For this reason, when using this mode, UNIT 1 and UNIT 2 should both be selected. This will allow you to load the same patch on both units, so both units have the same sound loaded. Below is an example scheme for using Multi Unit Poly Mode. In this example Multi-Unit Poly Mode must be turned ON in the Global Settings menu. Playing notes into MPG-70 on MIDI PORT 1 on channel 1 will play the two MKS-70 units as a single 24-voice synth. The diagram below shows a typical Multi-Unit Poly Mode setup.
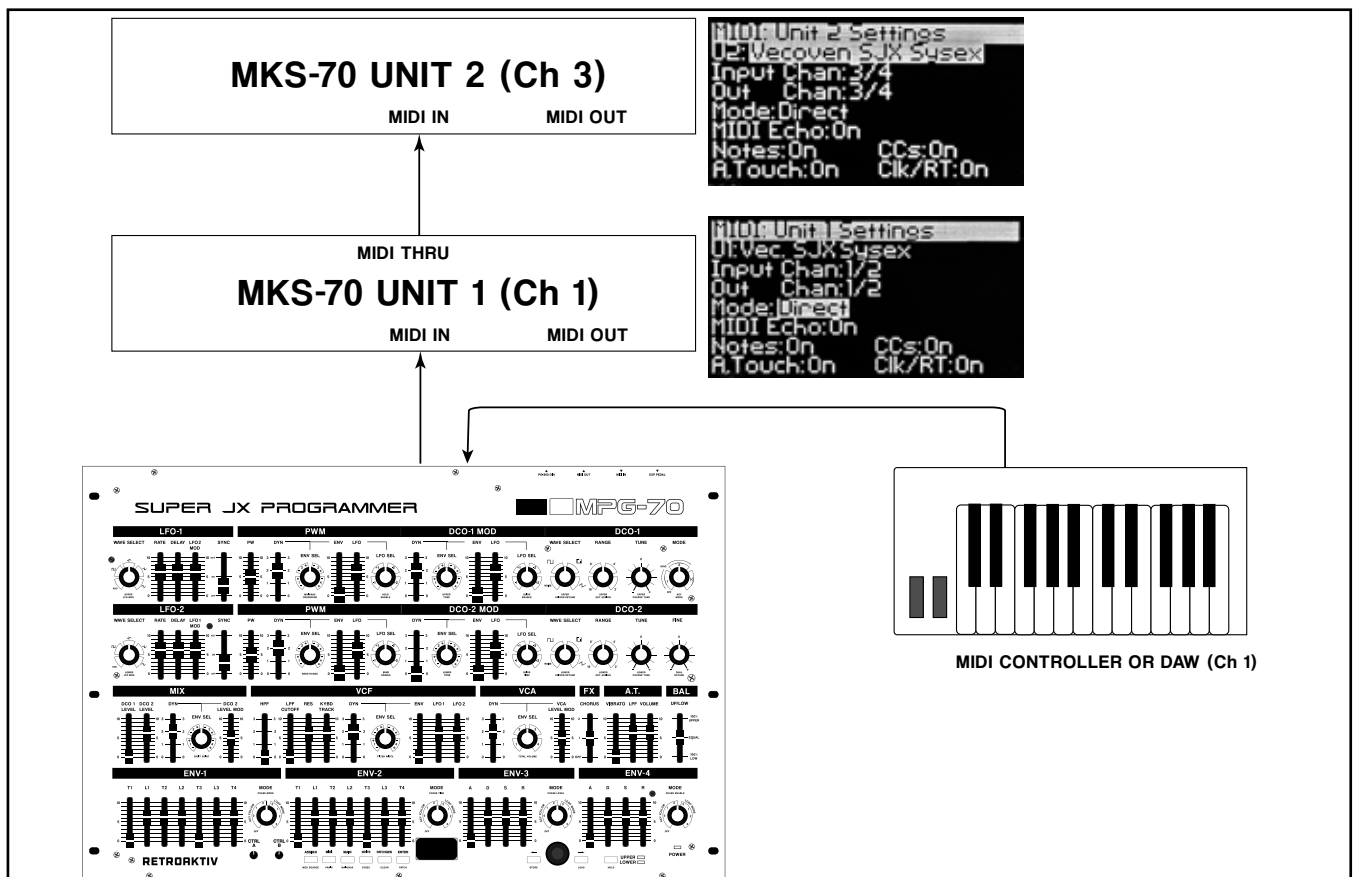
PROGRAM CHANGE MODE:

This determines how incoming program change messages are handled by MPG-70.

INTERNAL - When a program change is received, it will be used to select an object stored in MPG-70 internal memory.

ECHO - When a program change message is received, it will be transmitted out to the MKS-70, and will not select an MPG-70 object.

INTERNAL + ECHO - When program change is received, it will select an object from MPG-70 internal memory, athen the program change message will be sent to the MKS-70 as well.

When INTERNAL program change is selected, each type of MPG-70 object can be recalled using MIDI program changes.   Using this function, any tone, patch, assign or setup can be selected using MIDI program change and bank change messages. Below is a list of the functions that can be toggled in INTERNAL.

Patch U1 - Sets MIDI channel that Unit 1 Patch program change messages will be selected on.
Patch U2 - Sets MIDI channel that Unit 2 Patch program change messages will be selected on.
Tone U1 Upper - Sets MIDI channel that Unit 1 Upper Tone program change messages will be selected on.
Tone U1 Lower - Sets MIDI channel that Unit 1 Lower Tone program change messages will be selected on.
Tone U2 Upper - Sets MIDI channel that Unit 2 Upper Tone program change messages will be selected on.
Tone U2 Lower- Sets MIDI channel that Unit 2 LowerTone program change messages will be selected on.
Assign - Sets MIDI channel that ASSIGN program change messages will be selected on.
Setup - Sets MIDI channel that SETUP program change messages will be selected on.

CHORD MODE:

The MPG-70 CHORD MODE function allows users to input a chord, and then play it by keying a note. The chord will be transposed anywhere on the keyboard where a new note is keyed.   CHORD MODE can be enabled on UNIT 1, Unit 2, or BOTH units. Once enabled, a menu dialog will appear, showing the notes in the current CHORD. (ChordNt) Each of the notes in the chord can be entered manually, using the cursor and encoder, or the chord can be entered into the MPG-70 by holding SHIFT and playing a chord into the unit. To clear the current chord, press SHIFT to delete the current chord contents.
Chord Mode will allow 12 notes to be on at one time. Depending on the size of the chord and how many notes being held, the MPG will not "steal" voices. It will instead play the chords with any available voices.

Note: Chord Mode creates a large amount of MIDI data, which must all be passed in sequence to the synth. If you are trying to play a lot of notes with a large chord, and simultaneously send slider data, there may be timing issues, as all of the data cannot be passed to the synth quickly enough to prevent a delay.

MIDI: SYSEX MENU

To navigate to MIDI:Sysex menu, press the MIDI button until MIDI:Sysex is displayed in the menu bar at the top of the screen. The MIDI sysex menu is used for importing and export patches and bank data. Here is a brief explanation of each function in this menu:
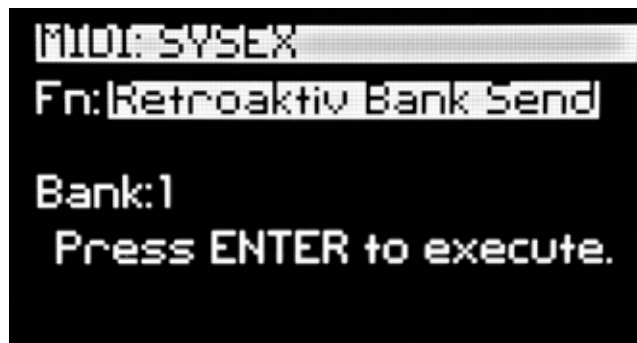
The MIDI:Sysex Menu

SEND JX/MKS BANK - Use this function to send a bank of patches to an MKS-70/JX from the MPG-70's internal memory. Select the bank on the MPG-70 to be transmitted, then press ENTER to initiate the transfer. Note: for this to work, bidirectional communication between the MPG-70 and MKS-70 is required. This means that the MPG-70 MIDI OUT is routed to MKS-70 MIDI IN, and the MKS-70 MIDI OUT is routed to MPG-70 MIDI IN. When transferring a bank of patches from MPG-70, it should be understood that the format of PATCH objects in the MPG-70/JX is different than the format of PATCH objects in the MKS-70 memory. In the MKS-70, there are 100 tones, and 64 patches, with each patch linking to 2 of the 100 tones. In MPG-70, we've eliminated the tedious TONE/PATCH linking required in MKS-70/SJX. Since we no longer use linked tones, when dumping MPG-70 format banks to MKS-70/SJX, we are limited to 25 patches per bank (Because MKS-70 only allows for 50 user tones to be stored in memory, and each patch takes 2 tones). This is the compromise that was needed in order to allow "one touch patch storage" in MPG-70.

RECEIVE JX/MKS BANK - Use this function to request a bank of patches from the MKS-70. Note: for this to work, bidirectional communication between the MPG-70 and MKS-70 is required. Select the destination bank in the MPG-70 and hit ENTER to load the MKS-70 bank to the destination bank. Note that instead of sharing tones, like the MKS-70 does, the MPG-70 will store the incoming patches as 25 patches, each with their own 2 tones, thus eliminating the linkage between each tone and any other patch. This means that if a "shared" tone is edited and stored on the MPG-70, it will not affect any other patches that also use that tone.

SEND MKS/JX TONE - This sends the current TONE to the MKS-70, where it can then be stored in MKS-70 format. Understand that when doing this, you may overwrite tones that are shared by other patches.

RECEIVE MKS/JX TONE - Downloads the current tone from MKS-70 into the selected destination and converts it into MPG-70 format.

RETROAKTIV BANK SEND/RECV - Exports or imports a bank of MPG-70 format patches in MPG-70 to a computer sysex librarian. Note that these will be in MPG-70 format, not MKS-70 format. Bidirectional communication not required for this operation.

STORAGE BACKUP - Exports a backup of all ASSIGN, PATCH, SETUP and TONE objects from the MPG-70. USed for backing up the contents of memory. Bidirectional communication not required.

STORAGE RESTORE - Allows a full-card backup file to be imported to the MPG-70. Warning: This will overwrite

the entire MPG-70 memory bank.

CONVERTING AN MKS-70 BANK INTO RETROAKTIV PATCH FORMAT

MPG-70 cannot receive MKS-70 banks directly from the computer.   To do this type of transfer, the sound bank must first be formatted to the Retroaktiv format. Once in this format, the bank can be loaded into the MPG-70 directly from the computer.   The Retroaktiv PATCH format eliminates the "tone sharing" scheme used on the MKS-70. To convert an MKS-70 bank to Retroaktiv Non-Shared format, connect the programmer and synth as shown below.

To convert a bank, do the following:

1. Send the bank from the computer to the MKS-70
2. Use the Receive MKS-70 Patch Bank function in the MPG-70 Sysex Menu to load the bank into the MPG-70.
3. Use the Send Patch Bank function in the MPG-70 Sysex Menu to send the bank to the computer. (Once in the MPG-70, the bank has been converted into Retroaktiv Patch format)
4. Now the converted bank can be dumped directly to MPG-70 from the computer using the Receive Patch Bank function in the Sysex Menu. The conversion just needs to be done once, then the bank can be directly loaded into MPG-70 from a sysex librarian.

The conversion of MKS-70 banks is necessary because if a bank contains tones that are not pointed to by patches in the MKS-70, then those tones will be lost, resulting in the transferred bank not being a carbon copy of the original.   Using the process above, no tone data will ever be lost. Once an MKS-70 bank is converted into Retroaktiv format, it can be exported to a PC in Retroaktiv format, and dumped back into any MPG-70 directly from the computer, without going through the MKS-70 first.
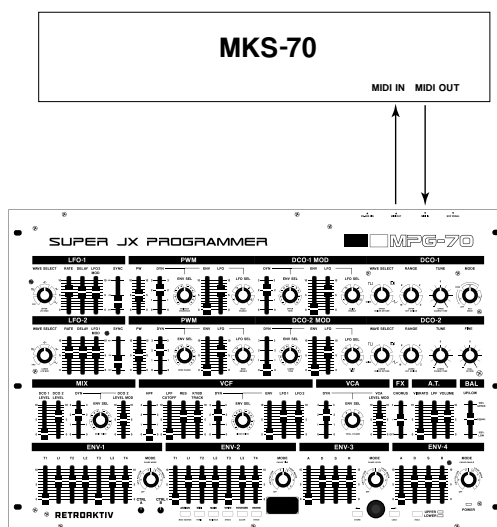
An example of bidirectional communication with the MKS-70

MIDI: USER CC MAPS

The MPG-70 allows users to create their own user CC maps, which allow the MPG-70's control surface to be programmed to transmit CCs from any slider, making it ideal for controlling external gear.

To use a CC map, navigate to Unit 2 MIDI: Settings page and select User CC as the unit type. The menu shown below will be displayed.

The MIDI:CC Map Menu

Creating a User CC Map:

When on the User CC Map page, moving any slider will display that slider's current CC# routing, as well as the MIDI channel that CC slider will transmit on. The encoder can then be used to enter which CC# each slider transmits on. **Each slider can transmit on any CC and any channel independently.**

Pressing [ENTER] when in the User CC Map menu will cycle through all sliders that have active CC routings, making it simple to see which sliders in a map are active.

The Default state of the User CC Map feature is OFF.   A User CC Map can only be used on the UNIT 2 layer of the MPG-70 when Unit 2 is set to User CC.

Clearing a User CC Map:

To clear all slider routings in a User CC Map, press [SHIFT]+[MIDI].

Storing and Loading User CC Maps:

MPG-70 internal memory can store 32 User CC Maps. To store or load a map, go to the User CC Map menu, and press the STORE or LOAD button once. A list of currently stored CC maps will be displayed. Select the desired slot to be loaded or stored, then press the [STORE] or [LOAD] button.   A CC map can be stored with a SETUP.

THE PATCH GENERATOR

The Patch Generator tool is a powerful feature that creates intelligently randomized tones, as well as preset "Init tones". This tool provides an endless supply of new, musical tones and patches.   Here's how it all works:

The Patch Generator uses categories so users can tell it which type of sound to create. Below is a chart showing the various categories and subcategories, as well as a brief description of the types of sounds each will generate. Note that these category and subcategory names are being used as "musical adjectives" to describe characteristics of a sound.   This common reference we all have allows us to easily categorize the types of sounds we want the patch generator to create.

The Patch Generator Menu

GENERATING A TONE

To generate a tone, select a category/sub-category, then use the [EDIT SEL] and [LAYER] buttons to select which synth layers the tone will be generated on. Press ENTER from the PATCHGEN page to generate a new patch.

Each section of the synth has its own ENABLE in the patch generator menu. Sections shown in the menu correspond to the sections labeled on the front panel. (DCO-1,DCO-2, VCF, LFO, MIXER, ADSR ENV, TL ENV, CHORUS, VCA, and AMP MOD) Setting a section's ENABLE to OFF prevents the patch generator from randomizing any of the parameters in that section when a new tone is created. To disable all sections, press PATCHGEN button. Pressing the PATCHGEN button again enables all sections.   This shortcut makes it simple to do something such as disable all sections, then set just one section to ON.

The patch generator is able to create multi-layer as well as single layer patches. It will select the KEY MODE and ASSIGN MODE according to the type of patch it is trying to create.

The VCA of the MKS/SJX/8P can distort. This happens at a different level from unit to unit. If you experience distortion when generating patches, simply mask VCA and set the VCA LEVEL MOD slider to where it doesn't distort.

PATCH GENERATOR CATEGORIES
* BASS – ALL, DECAY TO 0, SUSTAIN, RELEASE
* PADS – STEAM/AIR, BELL PADS, POLY PADS, GENERAL, ENV DETUNE
* POLY – ALL
* BELLS – ALL, GENERAL, KLANG
* BRASS – ALL
* STRINGS – ALL
* ORGAN – ALL, TONEWHEEL, PIPE
* PIANO – ALL, EL. PIANO, PIANO + STRINGS

ASSIGN

The ASSIGN functions on the MPG-70 are a powerful MIDI modulation matrix, which allows users to create complex modulation of multiple MKS-70 parameters using one control source, such as the ASSIGN sliders, an expression pedal, aftertouch, or any CC.

Each of the 7 assignable control sources can control up to 5 simultaneous parameters independently on any layer of either synth plugged into the MPG-70. This allows us to do something like sweep the filter cutoff up on the UPPER layer, while sweeping the cutoff down on the LOWER layer. Using the assigns and combinations of assigns, a sound can be animated in ways not possible on other controllers.

To access the ASSIGN menu, press the ASSIGN button once. The ASSIGN menu will be displayed on the OLED. This menu gives us access to all of the parameters contained in the assignable control matrix.
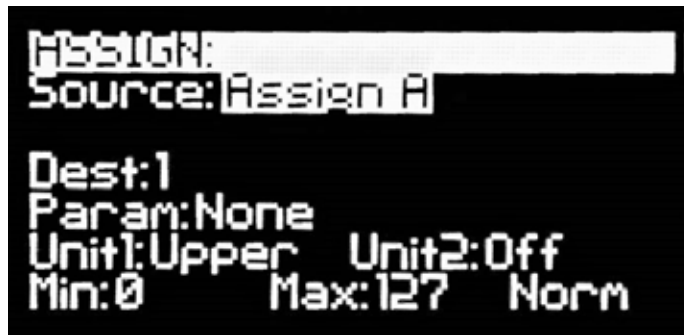
The Assign Menu

ASSIGN SOURCE

There are 7 different ASSIGNs (Control sources):

CTRL A Knob
CTRL B Knob
Expression Pedal Jack
Aftertouch
CC Source 1 (Any CC# 0-127)
CC Source 2 (Any CC# 0-127)
CC Source 3 (Any CC# 0-127)

The CTRL A and B sliders are located in the ASSIGN section of the MPG-70 front panel.

The Expression Pedal source is connected to the EXP PEDAL jack on the rear panel of the MPG-70. Only use passive expression pedals with the MPG-70. **Do not use a powered expression pedal.** This can result in damage to the controller.

The Aftertouch ASSIGN responds to incoming aftertouch messages on the UNIT 1 and UNIT 2 MIDI IN channels.

CC Source 1-3 are controlled by incoming CC messages (CC#0 - CC#127) on the UNIT 1 and 2 MIDI IN channels. These ASSIGNs are a great way to create automated "lanes" using a DAW. To automatically get the MPG-70 to route a CC ASSIGN to a CC, simply navigate to the desired CC ASSIGN, hold [SHIFT] and move the CC (Such as a mod wheel) and the MPG-70 will automatically route that CC to the ASSIGN.

DESTINATIONS AND ROUTING

Each of the 7 ASSIGN sources has 5 available destinations (parameters on the MKS-70) it can control. Each parameter being controlled by an assign has its own range, polarity, UNIT destination (Unit 1, 2, or BOTH), and layer destination (UPPER/LOWER/BOTH)

- **Dest (1-5)**: Selects which destination is being edited in the ASSIGN menu.
- **PARAM**: Selects which parameter will be the current destination.
- **MIN**: sets the minimum value of the current assign destination.
- **MAX**: sets the maximum value of the current assign destination.
- **UNIT 1**: Selects which layers of Unit 1 the current destination will be routed to.
- **UNIT 2**: Selects which layers of Unit 2 the current destination will be routed to.
- **INVERT/NORMAL**: Sets the direction (up or down) this parameter value will move in when the SOURCE value is changed.

For example, if we use CTRL A as a SOURCE, then select Filter Cutoff as Destination 1, moving the CTRL A knob will affect the Filter Cutoff parameter. To set the range of the filter control, we select the MIN and MAX values. If MIN = 50 and MAX = 75, then moving the CTRL A knob from bottom to top of its travel, will sweep the Filter Cutoff between 50 and 75. If we want the response to be inverted, so moving the CTRL A knob up sweeps the Filter Cutoff down from 75 to 50, then INVERT can be selected.

All of the 5 destinations within each ASSIGN can be routed in this way to any parameters on the synth. This allows the user to create complex real-time modulations, which would normally require many hands or many overdubs to accomplish, in a single movement.

To deactivate an ASSIGN layer, simply select NONE as the destination in a layer, and the routing will be deactivated for that layer.

There are a few guidelines to follow to maximize the MIDI performance of the MPG-70 when using assigns. An ASSIGN has the potential to generate large amounts of MIDI data. If you're using an ASSIGN with 5 layers, which is routed to BOTH layers of the synthesizer, this will generate 10 MIDI sysex messages with each movement of the ASSIGN source. This amount of midi data can take many tens of milliseconds to transmit to the synthesizer. If using many large ASSIGNs at one time, it may even be possible to overflow the synth's MIDI buffer (Which holds incoming MIDI messages while the synth processes each one in the buffer).

ASSIGN Enable & Disable - Pressing the ASSIGN button will alternate between the ASSIGN menu and the ASSIGN Enable menu. Each of the 7 assigns has its own global enable, allowing you to turn the assigns on only when you wish to use them.

Clear all ASSIGNS - To clear all ASSIGN data, navigate to the ASSIGN menu, then press [SHIFT]+[ASSIGN].

Clearing current ASSIGN - SHIFT + PATCHGEN

INTUITIVE ENTRY OF ASSIGN LAYERS

While users can manually enter all of the necessary information into each ASSIGN layer, this can become tedious when creating many different routing destinations. To speed up the ASSIGN creation process, a shortcut can be used to quickly enter a destination's parameters.
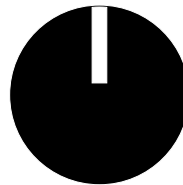
Begin by navigating to the source and destination to be edited.

Hold down the SHIFT button and move the destination slider through the desired range and direction (Up = normal, down = inverted) and release the SHIFT button when finished. The PARAM, MIN, MAX, and INVERT information will all be automatically entered.
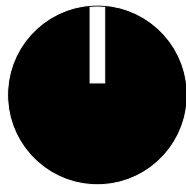
CTRL A   CTRL B

The ASSIGN A and ASSIGN B Source Knobs

"PEEK" MODE

If you want to see that a slider value is currently set to, navigate to the desired layer, then hold ENTER while moving the slider. The current value of the slider will be displayed on the screen, and it will not change when moved. This allows you to safely check the state of any control in a PATCH or TONE without changing the original value.

MIDI PANIC (ALL NOTES OFF)

In the event of stuck notes or other issues with MIDI, a MIDI PANIC message can be sent to the synth by pressing SHIFT + MIDI.

MPG-70 MEMORY STORAGE

MPG-70 allows users to store a variety of different "objects" such as PATCH, TONE, ASSIGNS, or a SETUP.   MPG-70 has the following banks of objects available if the optional Memory Expansion Card is installed:

*   1 bank of 32 User CC Maps
*   1 bank of 32 ASSIGN objects
*   1 bank of 32 SETUP objects
*   8 banks of 25 PATCH objects
*   8 banks of 32 TONE objects

Below is a diagram showing what each object type in the MPG-70 consists of.

TONE

UPPER OR LOWER

PATCH

LOWER TONE	UPPER TONE
PATCH SETTINGS	

SETUP

UNIT 1 LOWER TONE	UNIT 1 UPPER TONE	UNIT 2 LOWER TONE	UNIT 2 UPPER TONE
UNIT 1 PATCH SETTINGS		UNIT 2 PATCH SETTINGS	
ASSIGN 1 - 7 SETTINGS			
UNIT 2 USER CC MAP (IF USED)			

ASSIGN

ASSIGN A SLIDER	ASSIGN B SLIDER	EXPRESSION PEDAL	AFTERTOUCH	CC ASSIGN 1	CC ASSIGN 2	CC ASSIGN 3

SETUP STRUCTURE

A SETUP is a "snapshot" of all of the current settings on all layers in the controller.   A bank of 32 setups on the MPG-70 contains 64 patches (each with two tones) plus an assign. 32 setups can contain 128 tones.   SETUP consists of the following:

• Unit 1 UPPER and LOWER TONE layers + PATCH settings
• Unit 2 UPPER and LOWER TONE layers + PATCH settings
• Any User CC MAP being used
• Current ASSIGN settings (Assign A, Assign B, Exp Pedal, Aftertouch, and CC Assigns 1-3)

PATCH STRUCTURE

A PATCH is a "snapshot" of either the UNIT 1 or UNIT 2 LAYER in the controller. In the MKS-70, a patch points to the two tones it links to. In a typical MKS-70 bank, many tones are shared by multiple patches, which means if a tone is edited and saved, it affects all patches that share that tone. In the MPG-70, no tones are shared in a patch bank. A bank of 32 MPG-70 patches contains 64 individual tones, thus allowing us to store a patch on the MPG-70 with a single button press. For this reason, when a bank of MPG-70 patches is exported to MKS-70, only the first 25 patches will be transferred to the synth, as the synth can only hold 50 individual user tones.   A PATCH consists of the following:

• UPPER and LOWER TONE layers + UPPER and LOWER PATCH settings (Unit 1 or Unit 2 must be selected)

The following parameters are considered "global" parameters (They affect all layers of the patch): UPPER/ LOWER BALANCE, CROSSFADE, KEY MODE, SPLIT POINT.

These PATCH parameters have independent UPPER and LOWER values when in DUAL or SPLIT mode: ASSIGN MODE, BEND, A.T. SEL, GLIDE, HOLD, A.T. SENS, UNISON DETUNE, UPPER/LOWER LFO.

TONE STRUCTURE

A TONE is :

• UPPER or LOWER layer (of either Unit 1 or Unit 2)

ASSIGN STRUCTURE

An ASSIGN is a "snapshot" of all of the ASSIGN menus. An ASSIGN consists of the following ASSIGN Sources:

• CTRL A Slider
• CTRL B Slider
• Expression Pedal
• Aftertouch
• CC Source 1
• CC Source 2
• CC Source 3

STORING AND RECALLING OBJECTS

To store and name an object:

- Press SHIFT + LEFT (STORE) buttons, and navigate to the location new object will be stored.
- Press the [ENTER] button, and the storage dialog will appear.
- Enter the new name of the object to be stored. When naming an object, **[SHIFT]+ [RIGHT] will clear the current name**. **Tapping the encoder button will cycle through number, punctuation, upper and lower case characters quickly. (A - a - ! - 1)**
- Press [STORE] or [ENTER]. A "Success!" message will be displayed, and the object is now stored in memory. .

To load an Object

- Press the SHIFT + RIGHT buttons, and a list of the current objects will appear.
- Use the arrow keys or the encoder to navigate through the BANK. To advance BANK, press the SHIFT + RIGHT buttons again.
- Press [ENTER] to load the selected object. A "Success" message will appear when the object has been loaded.

To delete an object:

- Use the object buttons and the encoder to navigate to the object to be deleted. When the name of the object is highlighted, press SHIFT+LEFT to delete the object.

REFORMATTING (CLEARING) MPG-70 MEMORY

Power up holding both ASSIGN and ENTER buttons to reformat Object Memory.   **CAUTION: THIS WILL ERASE ALL OF YOUR OBJECTS.**

MPG-70 will always remember the settings from your last session when you power up.   Power up holding [STORE] to wipe out general user settings, such as MIDI settings.

BOOTLOADER AND SYSTEM UPDATES

The MPG-70 has a MIDI bootloader that allows users to update their OS in the field using a MIDI sysex utility such as MIDI OX. New OS files are available from Retroaktiv when updates are issued. To obtain an OS file, contact Retroaktiv and request a copy of the latest SYSEX OS file.   To identify your MPG-70's firmware version, power the unit up and the firmware version will be shown at the bottom of the MPG-70 splash screen. Check on the Retroaktiv site for the latest firmware updates.

ENTERING BOOTLOADER

To load update, power up MPG-70 with ENCODER button held.   UPPER LED will light, to indicate that unit is now in bootloader mode. A sysex librarian such as MIDI-OX or Sysex Librarian is used to load the new firmware file into the MPG-70. Set the delay after F7 to 160ms or greater. (This is the delay between sysex strings from the computer) Setting this too short will overflow the MPG-70 MIDI buffer, and you will get a blinking error code. The pause in between sysex packets allows the MPG-70 time to process each packet and write it to FLASH. When ready, send the file to the MIDI IN of the MPG-70. The UPPER LED will blink once for each sysex packet. UPPER LED will light solid when the OS has been loaded. When lit solidly, you can restart the unit and use the new OS. Please note that when sending the OS file, for the first 45 seconds, you will not see any blinking if the file is loading correctly. This is because the unit is parsing blank EEPROM packets (For older MPG-70 firmware versions before 3.x)

In some cases, you will receive an error code instead of the 1 blink per MIDI data packet. When you observe a series of multiple blinks in sequence, this means that there was an error. The MPG-70 cannot be "bricked", meaning that if a firmware update fails, the memory in the unit can always be restored to an operating state with the successful load of a firmware update.   If you receive one of the following errors, cycle power, enter the bootloader and try again.

BOOTLOADER ERROR CODES

- **2 blinks**: Didn't receive 0xF0 at beginning of message. This indicates a fundamental problem with the .syx file or MIDI communication. This means that a non-sysex message was received, and the bootloader must be restarted. The bootloader expects to see an F0 command bookended by an F7. If your DAW sends out active sensing messages, this will cause the bootloader to reject the incoming file. Any stray MIDI data will cause the bootloader to abort and give an error message. This is the most common error code. It most likely means that the delay between sysex packets needs to be longer (This is often called Delay after F7 in sysex librarians). When the delay is set to less than 160 ms, the MPG-70 MIDI buffer will overflow, causing the 2 blink error. If you get the 2 blink error code before you even begin sending data to the MPG-70, this means that you have either ACTIVE SENSING messages turned on, or your system is sending MIDI realtime messages, which will both corrupt the firmware data. Turn these off. If using a USB to MIDI cable, be aware that these often have active sensing permanently turned on. Use a dedicated hardware interface to update if this is the case.

- **3 blinks**: There was a problem parsing the dummy packets used as a placeholder while the system is writing data to the EEPROM space.   This error should never be an issue on MPG-70, as it writes its own EEPROM data file.

- **4 blinks**: Wrong product ID. Expected if a sysex file intended for a product other than the connected

programmer is used.   You will recevie this error if you do something like try to load an MPG-70 Firmware update onto an MPG-70.

- **5 blinks**: Error parsing sysex header. This is the most likely error to occur if the MIDI connection is not reliable and the system is receiving corrupted data.   Also check to make sure that you are loading the correct operating system into the controller. If this persists, contact Retroaktiv to make sure we didn't post the wrong firmware update.

- **6 blinks**: Checksum failure. There was an error in one or more of the bytes received during the sysex transfer.   Data was corrupted, either through an unstable connection, or a corrupted file. This could mean that your MIDI cable is intermittent, or that your firmware file is corrupt.

- **7 blinks**: Flash write failure. There was an error writing data to the flash memory in the microcontroller. This should never happen unless there is a hardware problem.

WEIGHT AND DIMENSIONS

The MPG-70 is 9 pounds and the enclosure measures 19" x 12.25" x 3.5".   The enclosure has 5 heavy-duty screw-on rubber feet for no-slip tabletop use.

THANK YOU!

Thanks for using these Retroaktiv synthesizer products. We are a small company and we appreciate the musicians and artists using this gear. If you have any questions or comments about this or other products, please contact us by visiting www.RetroaktivSynthesizers.com and using the CONTACT US link at the top of the page. We want to hear from you about your user experience and feature requests. Sincerely,

-Rob Currier
Owner and Chief Designer/Engineer at Retroaktiv LLC.