MIDI PROGRAMMABLE EQUALIZER

DigiTech

MEQ Quad 7
MEQ Dual 14
MEQ Mono 28

OWNER'S MANUAL

Getting Started

For quick set-up of the DigiTech MEQ, follow the instructions below. For best performance, follow the detailed instructions in "Making Connections" and "Operation".

INSTALL	Mount the DigiTech MEQ in a rack with the provided screws. Rubber feet have also been supplied with the unit for free-standing use.
APPLY POWER	Route the power cord away from audio lines to prevent interference.
CONNECT CABLES	Connect audio cables to the input jacks. Connect the output to an amp or mixer.
ADJUST EQUALIZATION	Turn on power. Adjust the EQ frequency band level by pressing the button below the band, then turning the dial until the frequency is at the desired level. Each click of the dial is equal to 1 dB.
RECALL PROGRAMS	To select a preset EQ curve, press PROGRAM and turn the dial clockwise one click per program number. Press RECALL to load and display the EQ curve.
STORE PROGRAMS	To save a new EQ curve, first select a program number, then press STORE. The EQ curve is saved to the displayed program number and overwrites any previous setting.

The DigiTech MEQ

DigiTech introduces three new MIDI-programmable equalizers (MEQs) to provide studio-quality sound control for a multitude of applications.

Standard features include full security lock-out, storage of 99 different EQ settings, EQ curve comparison, standard ISO frequency centers, non-volatile memory, and ± 12 dB of boost or cut.

The MEQ-28 is a professional 28-band equalizer with unparalleled features and performance. Using bands of 1/3rd octave, the MEQ-28 is ready for any equalization task, whether it's in the studio, on the stage, or in a permanent PA system.

The MEQ-14 provides two channels of independent equalization in bands of 2/3rds octave. Each channel has independent MIDI access, and both channels can be programmed in stereo link mode, making the MEQ-14 ideal for stereo applications.

The MEQ-7 allows independent access to each of its four channels, making the MEQ-7 ideal for keyboard and studio applications. The programmability makes it fast and easy to find just the right sound.

Safety Precautions

Use only standard AC voltage. Uninsulated dangerous voltages are present within the product enclosure. Opening the chassis for any reason will void the manufacturer warranty.
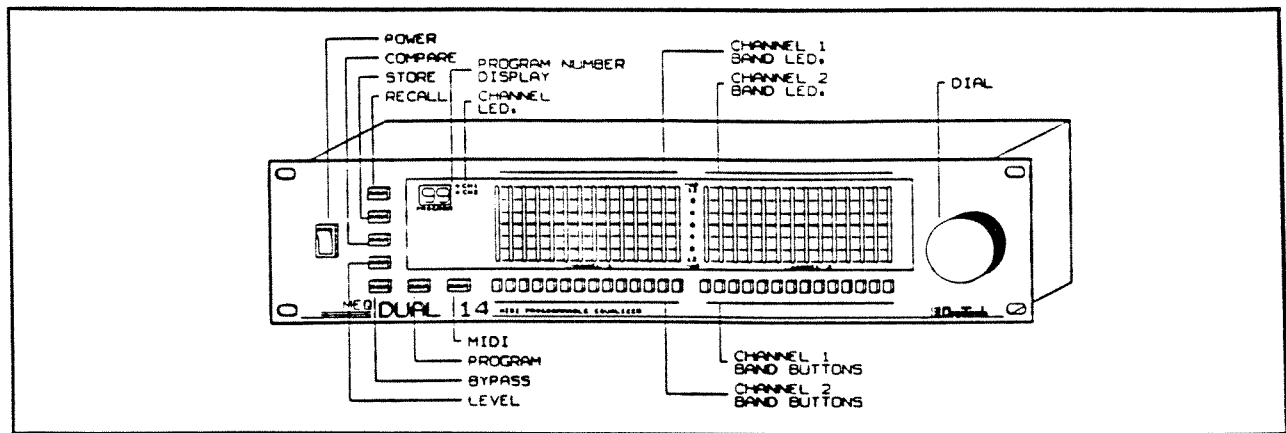
Do not get the DigiTech MEQ wet. If liquid is spilled on the unit, shut it off immediately and take it to the dealer for service.

Use of a surge protector is recommended to decrease chances of equipment damage from voltage surges or spikes.
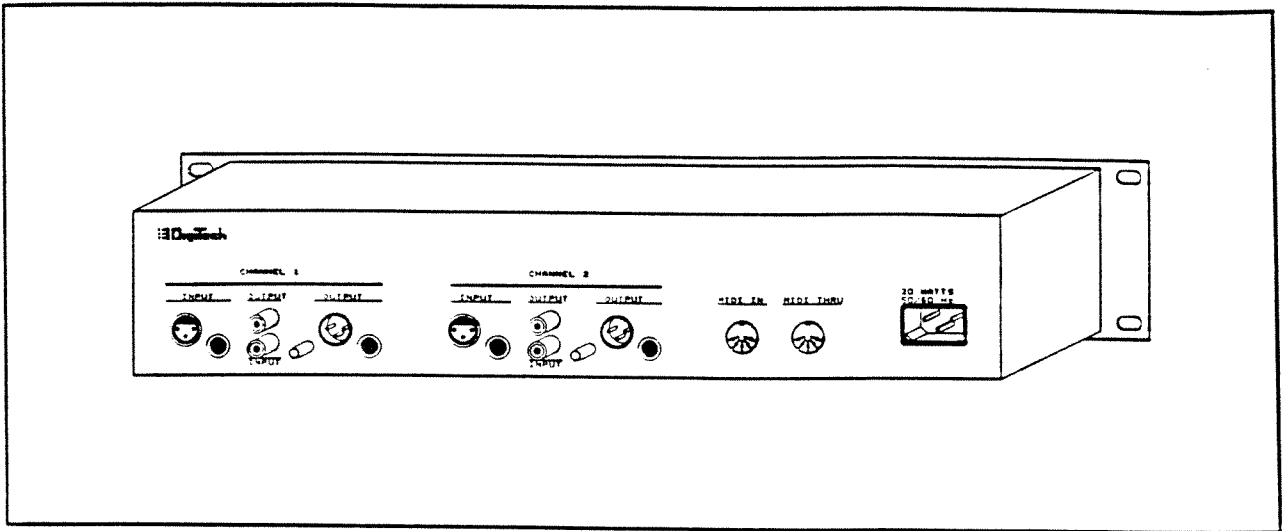
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Front Panel Controls

POWER   Turns the MEQ on and off. When turned on, returns to the same program as when it was shut off.

RECALL   Recalls the currently displayed PROGRAM NUMBER onto the EQ bar graph. See "Recalling Programs" (page 4).

STORE   Stores the currently displayed EQ curve into the displayed PROGRAM NUMBER. See "Storing Programs" (page 5).

COMPARE   Exchanges the curve in the active display memory with the curve in the compare memory for comparison purposes. See "Comparing Programs" (page 5).

LEVEL   Used to adjust the input level. For the Dual-14 and Quad-7, adjusts input level of each channel. See "Setting Input Level" (page 4).

BYPASS   Toggles the EQ in or out of the signal path.

PROGRAM   Puts the system in program select mode. For the Dual-14 and Quad-7, selects the EQ channels for store, recall and compare. See "Selecting Programs" (page 4).

MIDI   Puts the system in MIDI programming mode. Includes MIDI channel select and continuous controller links. See "MIDI Programming" (page 6).

PROGRAM NUMBER DISPLAY   Two-digit LED display showing the current program number, MIDI channel, continuous controller, or bypass mode.

CHANNEL LEDS   For the Dual-14, two LEDs indicating the selected EQ channel(s). For the Quad-7, four LEDs indicating the selected EQ channel(s).

BAND LEDS   Display the current setting of each EQ band.

BAND BUTTONS   Used to change the setting of the corresponding EQ band.

DIAL   Used to change the EQ band setting, program number, input level, MIDI channel, or continuous controller link.

Rear Panel

INPUT	For the **Mono-28**: one XLR jack and one 1/4-inch T-R-S jack. For the **Dual-14 and Quad-7**: one XLR jack, one 1/4-inch T-R-S jack, and one RCA jack for each channel.	**MIDI IN**	Five-pin DIN for standard MIDI cable. Receives MIDI control data. See "MIDI Programming" (page 6).
OUTPUT	For the **Mono-28**: one XLR jack and one 1/4-inch T-R-S jack. For the **Dual-14 and Quad-7**: one XLR jack, one 1/4-inch T-R-S jack, and one RCA jack for each channel.	**MIDI THRU/ OUT**	Five-pin DIN for standard MIDI cable. For MIDI thru and output functions. See "MIDI Programming" (page 6).

Operation

Use the following procedures to optimize the performance of the DigiTech MEQ.

SETTING INPUT LEVEL

Turn on the power, then press LEVEL. For the MEQ-28, the input gain appears on the PROGRAM NUMBER display. Turn the dial to adjust the level.

For the Dual-14 and Quad-7: Press LEVEL. The CH 1 LED lights and the CH 1 gain appears on the PROGRAM NUMBER display. Turn the dial to adjust the CH 1 gain. Push LEVEL again to adjust CH 2. If using a Quad-7, push LEVEL again to adjust CH 3, then push again for CH 4.

When adjusting the input level, the EQ bar graph acts as a headroom indicator. The top row indicates zero headroom, while the bottom row indicates 24 dB of headroom. Set the gain so the lights hit the top row only occasionally.

SELECTING PROGRAMS

When PROGRAM is pushed, the DigiTech MEQ goes into program select mode. Turn the dial one click per number to select the desired preset. Press RECALL to display the curve.

For the Dual-14: When PROGRAM is pushed, both CH 1 and CH 2 light so the programs for both channels may be recalled at the same time. By pushing PROGRAM again, only CH 1 lights; push PROGRAM again and only CH 2 lights. This permits recalling or storing different programs into each channel. Push PROGRAM again and both channels return.

For the Quad-7: When PROGRAM is pushed, all four channels light so the programs for all four channels may be recalled at the same time. By pushing PROGRAM repeatedly, the MEQ cycles through the following options: CH 1, CH 2, CH 3, CH 4, CH 1 and CH 2, CH 3 and CH 4, then back to all four channels. Different programs can be recalled or stored into each option.

RECALLING PROGRAMS

After selecting a program, press RECALL to pull the program curve into the display. Any curve already shown on the EQ is pushed into the compare memory. Any curve which was already in the compare memory is dumped. See "Comparing Programs" (page 5).

For the Dual-14 and Quad-7: If a program is recalled and the curves for each channel are identical, the system puts them into stereo link mode. See "Adjusting EQ". To disengage stereo link, press any CH 2 or CH 4 band button.

ADJUSTING EQUALIZATION

After recalling a program, adjust the EQ curve by pressing the band buttons. When selected, all LEDs reverse on the band, then return to normal as the dial is turned. Any number of band buttons can be pressed and adjusted at the same time. The selected bands go into reverse mode, then adjust up or down as the dial is turned.

For the Dual-14: A stereo link mode will connect all bands for CH 1 and CH 2. To use stereo link, press a band button on CH 1 (the master channel), then press the corresponding band button on CH 2 (the slave channel). All settings on CH 1 copy over to CH 2, showing they are linked. Now press a band button on the master channel and the band on the slave channel lights and adjusts simultaneously. To disengage the link, press a CH 2 band button.

For the Quad-7: A stereo link mode will connect all bands for CH 1 and CH 2, or CH 3 and CH 4. To use stereo link, press a band button on CH 1 or CH 3 (the master channels), then press the corresponding button on CH 2 or CH 4 (the slave channels). The band settings on the master channel copy over to the slave channel, showing they are linked. Now press a band button on a master channel and the slave channel band lights and adjusts simultaneously. To unlink, press a CH 2 or CH 4 band button.

Operation (continued)

STORING PROGRAMS

After modifying the EQ curve, the new settings can be saved to one of the program numbers by pressing STORE.

Use the following procedures to store a new curve:

1. Adjust the EQ curve as desired.

2. Press PROGRAM and turn the dial to the program number where the curve will be stored.

3. Press STORE. The EQ curves for the active channels will be saved, overwriting what was previously in the program's memory.

For the Dual-14 and Quad-7: EQ settings can be stored separately for each channel by selecting active channels with the PROGRAM button.

For example, certain settings may require only one channel (or two or three channels for the Quad-7). Press PROGRAM until the desired channel LEDs light, adjust the EQ, then store as outlined above.

COMPARING PROGRAMS

The DigiTech MEQ operates with two buffers: the active display memory, and the compare memory. The active display memory consists of what is currently shown on the EQ. The compare memory is a buffer for temporary storage of an EQ curve.

When RECALL is pushed, any curve already shown on the EQ is pushed into the compare memory, and the recalled program is put in the active display memory. Any curve which was already in the compare memory is dumped.

When COMPARE is pushed, the MEQ swaps the program in the active display memory with the program in the compare memory.

To compare a modified EQ curve against the originally stored curve:

1. Press PROGRAM. Select the desired program number. Press RECALL. The program is displayed on the EQ.

2. Press RECALL again. The original program goes into the compare memory as well as the active display memory.

3. Modify the EQ curve as desired.

4. Press COMPARE. The new program curve goes into the compare memory, and the original curve becomes active.

5. After comparing, store the new EQ curve.

To compare two previously stored programs:

1. Press PROGRAM. Select the first program number. Press RECALL. The first program is displayed on the EQ.

2. Press PROGRAM again. Select the second program number. Press RECALL. The first program goes into the compare memory, and the second program is displayed.

3. Press COMPARE to alternate between the first and second program.

4. Modify either or both curves as desired while alternating.

BYPASS MODE

When BYPASS is toggled on, the line signal goes through the DigiTech MEQ without any effect. The LEDs on the EQ bands are off, and the PROGRAM NUMBER reads "by" (shown at right).
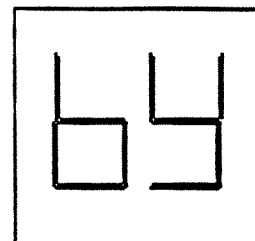
MIDI Programming

MIDI is used by music equipment manufacturers to allow different components to communicate with each other. For example, a synthesizer, MIDI controller or MIDI computer could be used to change the program number of all components on the same MIDI channel, including the DigiTech MEQs.

There are 128 MIDI functions, called continuous controllers (CCs), which can be used to externally control most functions of the DigiTech MEQ. See Appendix A, "Standard MIDI Continuous Controllers" (page 9).

SELECTING MIDI CHANNELS

The DigiTech MEQ can receive data from 16 MIDI channels coming through the MIDI input jack. Press the MIDI button and the PROGRAM NUMBER displays which MIDI channel is being received. Turn the dial to select MIDI channels 0-16 or 01 for omni.

LINKING EQ BANDS TO MIDI

After selecting the MIDI channel, press an EQ band button to link the band to a CC. The PROGRAM NUMBER displays which CC is active. Turn the dial to select a CC from 0-99.

Select each EQ band button and CC in the same manner, one at a time. After the linkages have been set, each band is changed whenever the corresponding CC on that channel is changed.

For the Dual-14 and Quad-7: Each MEQ channel must be programmed for MIDI separately. When the MIDI button is pressed, the CH 1 LED lights. Continue pressing the MIDI button until the desired MEQ channel LEDs are lit. Set the CC linkages as outlined above, then press the MIDI button again to go to the next MEQ channel.

LINKING MEQ LEVEL TO MIDI

The DigiTech MEQ input level can also be linked to a CC. Press the MIDI button until the desired MEQ channel LED is lit, then press LEVEL. The PROGRAM NUMBER displays which CC is active. Turn the dial to change CCs.

LINKING MEQ BYPASS TO MIDI

To link the DigiTech MEQ bypass to a CC, press the MIDI button, then press BYPASS. The PROGRAM NUMBER displays which CC is active. Turn the dial to change CCs.

VIEWING CC ASSIGNMENTS

To review the MIDI assignments, push the MIDI button, then push either the EQ band buttons, LEVEL or BYPASS. The assigned CCs will be displayed.

For Dual-14 and Quad-7: Push the MIDI button until the desired channel is selected, then push either the EQ band buttons, LEVEL or BYPASS.

EXITING MIDI MODE

If no button is pressed for five seconds, the DigiTech MEQ automatically exits MIDI mode and returns to program mode. Pressing PROGRAM will also exit MIDI mode.

Maintenance and Service

Keep the DigiTech MEQ clean by occasionally dusting the cover and wiping the front panel with a slightly damp cloth. Periodically check the wires and connectors on the back of the unit to make sure they are not crimped or frayed.

There are no user-serviceable parts inside the DigiTech MEQ. Opening the chassis for any reason will void the warranty.

All service and repair must be performed by the factory for the warranty to remain in effect. Should a problem arise with the DigiTech MEQ, contact a DigiTech dealer for repair procedures.

Acronyms and Abbreviations

AC	alternating current
CC	continuous controller
CH	channel
dB	decibel
EQ	equalization
FCC	Federal Communications Commission
LED	light-emitting diode
MEQ	MIDI-programmable equalizer
MIDI	Musical Instrument Digital Interface
T-R-S	tip-ring-sleeve

(handwritten: ¼" is switchable)

(handwritten: RCA is -10 XLR is +4)

FCC Compliance

This equipment has been tested and found to comply with the limits of a Class B computing device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and receiver.

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

- Consult the dealer or an experienced radio/TV technician for help.

Specifications

Freq. Response:	20 Hz to 20 kHz (+0, -0.25 dB)
THD:	Less than 0.03% (@ 0.775v_{rms} and 1 kHz)
SNR:	Greater than 90 dB (ref 0.775v_{rms})
Maximum Input:	+20 dBv (ref 0.775v_{rms})
Maximum Output:	+20 dBv (ref 0.775v_{rms})

Input Impedance:

XLR		40 k
1/4"	+4 Bal	40 k
	+4 Unbal	20 k
	-10	470 k
RCA		470 k

Output Impedance: 51 ohm

Frequency Centers: MEQ-28
28-ISO Standard 1/3 octave
31.5Hz to 16kHz   +/- 3%

MEQ-14
14-ISO Standard 2/3 octave
40 Hz to 16kHz   +/- 5%

MEQ-7
7-ISO Standard 4/3 octave
63 Hz to 16kHz   +/- 5%

(handwritten: Analog filters)

(handwritten: 28 differential input)

(handwritten: Ootpd +4 bal.)

(handwritten: -10 unbal)

Appendix A

STANDARD MIDI CONTINUOUS CONTROLLERS

XCR
MIC
¼ is bal. +4

RCA   -10

19" x 3.5" x 8.5"

CONTROLLER NUMBER	CONTROLLER FUNCTION
0	Undefined
1	Modulation wheel or lever
2	Breath controller
3	Undefined
4	Foot controller
5	Portamento time
6	Data entry MSB
7	Main volume
8	Balance
9	Undefined
10	Pan
11	Expression controller
12 through 15	Undefined
16 through 19	General purpose controllers 1 through 4
20 through 31	Undefined
32 through 63	LSB for values 0 through 31
64	Damper pedal (sustain)
65	Portamento
66	Sostenuto
67	Soft pedal
68	Undefined
69	Hold 2
70 through 79	Undefined
80 through 83	General purpose controllers 5 through 8
84 through 91	Undefined
92	Tremolo depth
93	Chorus depth
94	Celeste depth
95	Phaser depth
96	Data increment
97	Date decrement
98	Non-registered parameter number LSB
99	Non-registered parameter number MSB
100	Registered parameter number LSB
101	Registered parameter number MSB
102 through 121	Undefined
122 through 127	Channel mode messages

Appendix B

DOD/DIGITECH ELECTRONICS SYSTEM EXCLUSIVE FORMAT

INTRODUCTION

The DOD/DigiTech Electronics System Exclusive Format facilitates use and control of various signal processing devices manufactured by DOD/DigiTech Electronics. The format allows different types of data transfer with capability for future expansion.

Currently, a DOD/DigiTech digital signal processor can receive machine-dependent microcode, and user-programmed parameters can be received from and dumped to external devices.

Device Type	03H	
Procedure Type	00H	Request for program dump (all programs)
	40H	Download microcode
	41H	Download program dump (all programs)

GENERAL FORMAT

1111 0000	System-exclusive status byte
0000 0000	DOD/DigiTech manufacturer's
0000 0000	ID number
0001 0000	(00H 00H 10H)
0000 nnnn	Unit number; nnnn + 1 equals the channel number
0ttt tttt	device type
0ppp pppp	procedure type
0ddd dddd	
0ddd dddd	Procedure data type
0ddd dddd	(128 possible)
0ddd dddd	
1111 0111	End-of-exclusive status byte

DEFINITIONS

Unit Number — Internal representation of the channel to which the receiving device is listening. Used to communicate to different devices of the same type connected to a common MIDI line. This byte is ignored if the receiving device is set to omni.

Device Type — Specifies the DOD/DigiTech product receiving communication.

Procedure Type — Up to 128 procedure commands specifying which procedures within a device are to be executed. The first 64 (00H to 3FH) are universal procedures that apply to all device types. The second 64 (40H to 7FH) are specific to a particular device type.

Data — Transmits data specified by the executed procedure. See "Specific Formats" for the expected data format.

(Microcode is packed into groups of four data bytes. Specific information on the DigiTech MEQ microcode programming is proprietary information of DOD/Digitech Electronics Corporation.)

Appendix B (continued)

SPECIFIC FORMATS FOR THE DigiTech MEQ

Sending Microcode to the DigiTech MEQ

1111 0000	System-exclusive status byte
0000 0000 0000 0000 0001 0000	DOD/DigiTech ID
0000 nnnn	Unit number (+ 1 = channel)
0000 0011	DigiTech MEQ device
0100 0000	Send to DigiTech MEQ
0ddd dddd 0ddd dddd 0ddd dddd 0ddd dddd	Data byte 1 Data byte 2 (Groups of four, 128 total possible)
1111 0111	End-of-exclusive status byte

Requesting User Programming Dump (All Programs)

Device requesting dump:

1111 0000	System-exclusive status byte
0000 0000 0000 0000 0001 0000	DOD/DigiTech ID
0000 nnnn	Unit number (+ 1 = channel)
0000 0011	DigiTech MEQ device
0000 0000	Procedure (dump all programs)
1111 0111	End-of-exclusive status byte

DigiTech MEQ dump response:

1111 0000	System-exclusive status byte
0000 0000 0000 0000 0001 0000	DOD/DigiTech ID
0000 nnnn	Unit number (+ 1 = channel)
0000 0011	DigiTech MEQ device
0100 0001	Download all programs
0ddd dddd 0ddd dddd " " 0ddd dddd 0ddd dddd	Data byte 1 Data byte 2 Data byte 3173 Data byte 3174
1111 0111	End-of-exclusive status byte

Downloading Dumped User Programs (All Programs)

1111 0000	System-exclusive status byte
0000 0000 0000 0000 0001 0000	DOD/DigiTech ID
0000 nnnn	Unit number (+ 1 = channel)
0000 0011	DigiTech MEQ device
0100 0001	Download all programs
0ddd dddd 0ddd dddd " " 0ddd dddd 0ddd dddd	Data byte 1 Data byte 2 Data byte 3173 Data byte 3174
1111 0111	End-of-exclusive status byte

Warranty

1. The warranty registration card must be mailed within ten days after purchase date to validate this warranty.

2. DigiTech warrants this product, when used solely within the U.S., to be free from defects in materials and workmanship under normal use and service.

3. DigiTech liability under this warranty is limited to repairing or replacing defective materials that show evidence of defect, provided the product is returned through the original dealer, where all parts and labor will be covered up to a period of one year. The company shall not be liable for any consequential damage as a result of the product's use in any circuit or assembly.

4. Proof-of-purchase is considered to be the burden of the consumer.

5. DigiTech reserves the right to make changes in design or make additions to or improvements upon this product without incurring any obligation to install the same on PRODUCTS PREVIOUSLY MANUFAC-TURED.

6. The foregoing is in lieu of all other warranties, expressed or implied, and DigiTech neither assumes nor authorizes any person to assume for it any obligation or liability in connection with the sale of this product. In no event shall DigiTech or its dealers be liable for special or consequential damages or from any delay in the performance of this warranty due to causes beyond their control.

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