SERGE MODULAR MUSIC SYSTEMS

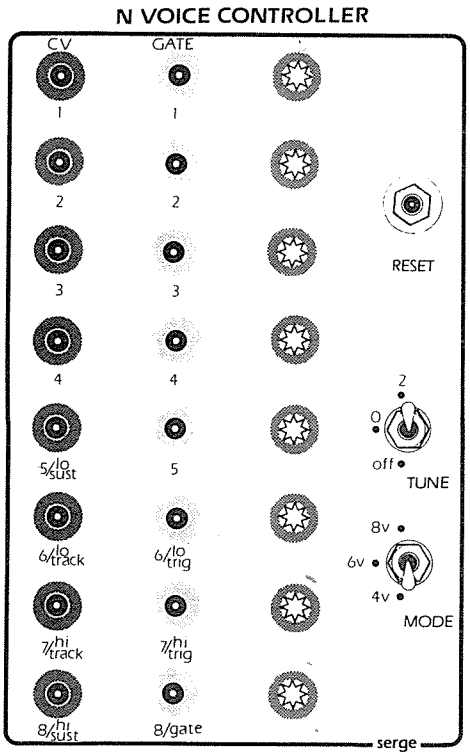
CONTROL VOLTAGE GENERATORS and MODIFIERS

The SERGE N Voice Controller (NVC) is a micro-processor based digital-to-analog converter. This module converts the inexpensive CASIO keyboard to a monophonic/polyphonic keyboard with voltages, gates, and triggers for controlling the analog synthesizer. This interface will work with the Casio keyboard models MT-10, MT-30, MT-31, MT-40, CT-201, and CT-202.

In this version, there are 8 voltage outputs plus five gates and three triggers. There are three switches, one push-button for resetting the interface on initial power-up, or after altering the keyboard's main clock frequency (through modifications such as a hardware octave drop or hardware control of the keyboard's high fregency clock). A second switch switches to true six or eight voice polyphony, mainly intended to control multiple homogeneous voices in the modular synthesizer. The third switch sets all control voltage outputs at either 2 or 4 volts, and sets gates high for tuning the oscillator voices.

The different control voltage outputs are as follows:

1. High Key with Sustain. This voltage will correspond to the last high key depressed on the keyboard. If other low keys are sustained, then when the high key is released, the voltage will not shift down to the lower held keys, but will sustain at the last high note played. Any new key played which is higher than the highest current key depressed will be reflected at the output. Any new key played which is lower than the current held key will be ignored. Whenever a new high key is played, or when the same high key is repeated (while other lower keys held) a High Trigger will be produced.
2. Current High Key. This voltage will correspond to the current actual highest key depressed.
3. Latest Key. This might be the most useful output for a monophonic synthesizer voice. It is updated each time a new key is played. If a three-note chord is held, and the middle note is lifted then depressed, the middle note will be the "latest key". The triggers from this voice will always trigger with a new high key, a new low key, or any new intermediate key.
4. Low Key with Sustain. Like the High Key with Sustain, this output will hold the previous low note if other higher keys are sustained. Any new low key will cause the Low Trigger to activate.
5. Gate. Whenever any key is depressed the Gate goes high for use with envelope generators (ADSR's or Slopes).
6. High Trigger. For use with ADSR's to retrigger on new high keys .
7. Low Trigger. For use with ADSR's to retrigger on new low keys.
8. Latest Trigger. For use with ADSR's to retrigger on most recently played key.



The above configuration is designed mainly to be used with a one or two voice synthesizer. Since the Casio keyboard has internal eight note polyphony, its own forty-nine different waveforms can be further processed and and extended using the voices of the synthesizer and the various voltage-controlled signal processors in the synthesizer. Thus the keyboard can be used as both a polyphonic device and a monophonic "lead" synthesizer simultaneously. The combination of a Serge Voice with a processed Casio sound is an extremely versatile voice, "fatter" than the fattest synthesizer sounds from a monophonic instrument. With blending and contrasting of synthesizer voice and processed Casio voice, wide ranging timbres are available using a minimum of synthesizer modules.

For more standard polyphonic applications, four-voice polyphony is available simultaneously with the above monophonic outputs. A front panel switch will change the interface logic to standard 6 and 8-voice polyphony. Six or eight keyboard control voltages and six or eight corresponding gate signals can be used to control multiple synthesizer voices for six and eight-note polyphony.

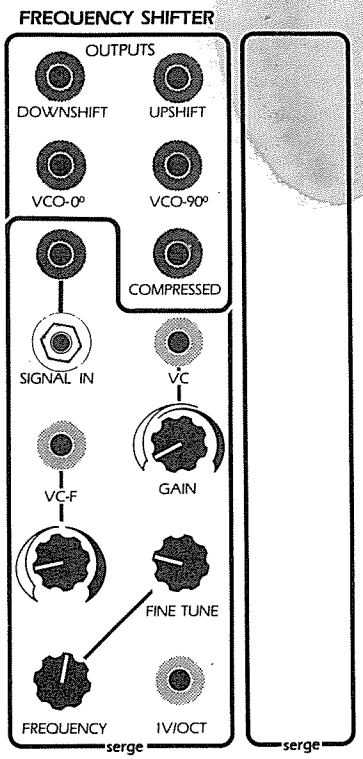
Although Serge Modular does not do custom modifications to Casio keyboards as a service, a number of mods are installed with keyboards delivered with the N Voice Controller:

1. Octave Drop. A switch allows the keyboard to be extended a full octave lower for all voices. This switch will also lower the N Voice control voltage outputs by one volt.
2. Hold. A switch to engage a different type of sustain than that available with the Sustain Pedal or Sustain Switch on the unmodified Casio. It provides a "non-overlapping" sustain. If one note (or chord) of the organ voice is played, it will be sustained until another note (or chord) is played.
3. Silent Voice Select. This is the same as the SET switch on the Casio except that the note will not sound when setting new voices.
4. In addition to these mods which will work without the N Voice Controller, a multi-pin connector is added to interface the NVC to the internal circuitry of the Casio.

Other modifications are available through local personnel. Although Serge Modular does not do this type of service, we would be glad to refer you to those who do custom work on Casio keyboards (or if the above modifications are desired without the NVC unit).

SERGE MODULAR MUSIC SYSTEMS

AUDIO SIGNAL MODIFIERS



The FREQUENCY SHIFTER is an advanced model with several improvements over existing designs:

1. Greatly improved signal-to-noise ratio.
2. Extremely high carrier frequency rejection.
3. A very clean sound down to very low signal levels (unlike conventional shifters which have increasing distortion at low levels)
4. No squelch circuit and, therefore, no annoying dropouts or "pumping" action in the sound.

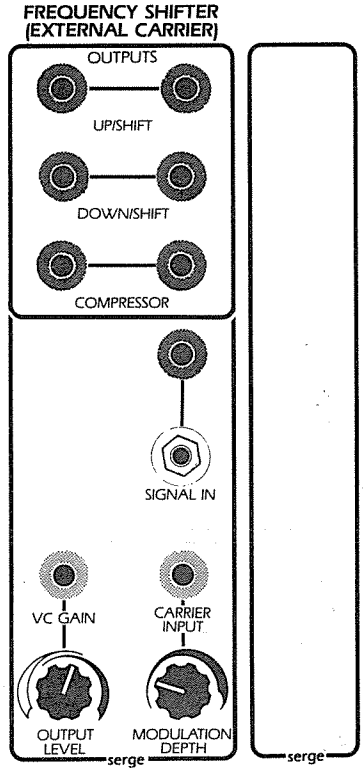
These improvements have so improved the quality of the sound, that even the most subtle natural sounds can be processed. Apart from its effect, the FREQUENCY SHIFTER does not intrude with extraneous noises or distortions.

The FREQUENCY SHIFTER does not transpose. Rather it shifts each harmonic of the signal by a fixed value equal to the shifting frequency. Thus, as the shifting frequency becomes larger, the relationships between overtones are altered, and timbres change dramatically.

Uses of the FREQUENCY SHIFTER abound. It can be used to frequency modulate natural sounds (from musical instruments, for example), to produce the "Leslie effect" of rotating speakers, and to synthesize other phase shift and vibrato effects. In concert halls, frequency shifters are often used to control feedback. It performs special effects on human speech, excellent for "computer-like" or "alien-type" speech. One of its most dramatic effects is frequency shifting of an echoed sound, where delayed signals get succesively fed back and shifted up or down to produce incredible arpeggios of multiple echoes. Such an effect can be produced with the FREQUENCY SHIFTER and a reverb chamber or tape delay. Quite similar (and other rather far-out) effects can be produced with the use of the Analog Delay module.

The FREQUENCY SHIFTER is available in two versions. The basic unit features a built-in oscillator (with 0 and 90 degree outputs) whose sine wave outputs provide for the smoothest and cleanest shifting. Available (at higher cost and only on on special request) is a version which accepts any external shifting signal. This version may be of interest to musicians wanting to shift the sound of one instrument by another, say the flute by a tuba. Additional features of both versions of the FREQUENCY SHIFTER include output VCA's for both the UP and DOWN shifted signals, and an output providing a COMPRESSED version of the input.

Both modules take up 3 inches of Panel space, with one of the inches left blank (as shown) or filled by 1 inch modules which do not require a PC board. The CONTROL MODULE and the ADAPTER modules are examples of this type of module.



September 1982 pricing :

	kit	assembled
FREQUENCY SHIFTER	$550	$690
FREQUENCY SHIFTER (External Carrier)	$625	$780

572 Haight Street • San Francisco CA 94117 • (415) 621-6898

SERGE MODULAR MUSIC SYSTEMS

PRICE LIST

Effective SPRING-SUMMER 1982

SIZE	CODE	MODULE NAME	KIT PRICE	ASS'B PRICE	
		VOLTAGE CONTROLLED OSCILLATORS			
3"	NTO	New Timbral Oscillator	207.00	275.00	
2"	PCO	Precision VCO	138.00	175.00	
		VOLTAGE CONTROLLED AMPLIFIERS			
2"	UAP	Universal Audio Processor	165.00	210.00	(new)
1"	2VCA	Dual VCA	140.00	185.00	(new)
1"	XFAD	VC Cross-Fader	155.00	190.00	(new)
		VOLTAGE CONTROLLED FILTERS			
2"	VCFQ	Variable 'Q' VC Filter	139.00	170.00	
2"	VCFS	Variable Slope VC Filter	125.00	165.00	
2"	VCF2	Variable Bandwidth VC Filter	150.00	190.00	
2"	VCFX	Extended Range VCFQ	143.00	175.00	
		VOLTAGE CONTROLLED OUTPUT MIXERS			
4"	QVM	Voltage Controlled Stereo Mixer	305.00	410.00	
8"	SMX	Multi-Channel Stereo Panner	560.00	675.00	
2"	PAN	Dual Stereo Panner Channel	165.00	193.00	
6"	QMX	Multi-Channel Quadraphonic Mixer	465.00	536.00	
2"	QPC	Quad Panner Channel	180.00	206.00	
		AUDIO MIXERS (MANUAL)			
3"	MIX	Dual 3-Input Audio Mixer	75.00	105.00	
2"	MIX2	Dual 3-Input Audio Mixer	70.00	100.00	
4"	MXP	Four Input Stereo Mixer/Panner	95.00	155.00	
6"	MAX	Matrix Mixer	195.00	320.00	
		PREAMPS & ENVELOPE DETECTORS			
1"	PRNV	Preamp Detector	130.00	160.00	(new)
1"	ENV	Envelope Detector	90.00	125.00	(new)
1"	ENV2	Dual Envelope Detector	160.00	210.00	(new)
		AUDIO PROCESSORS			
3"	WAD	Wilson Analog Delay	390.00	470.00	(new)
2"	EQ	Resonant Equalizer	163.00	220.00	
2"	PHA	VC Phaser	147.00	175.00	
2"	2PHA	Dual VC Phaser	290.00	340.00	
2"	TWS	Triple VC Waveshaper	96.00	130.00	
1"	RING	Ring Modulator	110.00	140.00	(new)
2"	VCM	VC Wave Multipliers	160.00	230.00	
7"	PEF	Pitch and Envelope Follower	450.00	570.00	

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SIZE	CODE	MODULE NAME	KIT PRICE	ASS'B PRICE	
		CONTROL VOLTAGE GENERATORS AND MODIFIERS			
16"	TKB	Touch Activated Keyboard Sequencer	610.00	800.00	
5"	SQP4	4-Stage Sequencer Programmer	180.00	240.00	(new)
6"	SQP5	5-Stage Sequencer Programmer	195.00	260.00	(new)
7"	SQP6	6-Stage Sequencer Programmer	210.00	280.00	(new)
8"	SQP7	7-Stage Sequencer Programmer	225.00	300.00	(new)
9"	SQP8	8-State Sequencer Programmer	240.00	320.00	(new)
4"	SEQ8	8-Stage Sequencer	180.00	240.00	(new)
1"	QSEQ	Quantizer for 5-8 Stage SQP's	270.00	305.00	(new)
2"	QUAN	Quantizer	270.00	305.00	(new)
2"	QTKB	Quantizer for TKB	285.00	325.00	(new)
3"	DSG	Dual Universal Slope Generator	140.00	170.00	
3"	SSG	Smooth & Stepped Function Generator	140.00	180.00	
2"	DTG	Dual VC Transient Generator	125.00	155.00	
1"	COM	Dual Comparator	140.00	170.00	(new)
1"	NCOM	Divide-by-N Comparator	140.00	170.00	(new)
1"	STR	Dual Schmitt Trigger	140.00	170.00	(new)
2"	NOI	Noise Source	115.00	142.00	
2"	RVG	Random Voltage Generator	140.00	165.00	
2"	2RVG	Dual Random Voltage Generator	265.00	315.00	
2"	RS	Random Source	260.00	300.00	(new)
2"	ASR	Analog Shift Register	125.00	140.00	
2"	2ASR	Dual Analog Shift Register	245.00	275.00	
2"	ADSR	Extended ADSR Envelope Generator	140.00	180.00	
		PROCESSORS AND CONVENIENCE MODULES			
1"	ACPR	Active Processor	136.00	162.00	
2"	PRC	Dual Processor	75.00	110.00	
2"	SPRC	Scaling Processor	85.00	85.00	
1"	BUFF	Scaling Buffer	65.00	105.00	
1"	C/M	Control Module	25.00	45.00	
1"	ADP	Adaptors (4 Mini, RCA, or Phone)	10.00	17.00	
		POWER SUPPLY, PATCHCORDS, AND PACKAGING			
	PWB	Power Supply in Small Chassis Box	100.00	100.00	
	POM	Pomona Molded Cables (10)	20.00	20.00	
	POML	Long Pomona Molded Cables (10)	22.00	22.00	
	P/R	Panel/Rack	25.00	25.00	
	BOX	Chassis Box	15.00	15.00	
	ROX	Rack Mountable Chassis Box	25.00	25.00	
	CAB	Wooden Cabinet for Four-Panel System (price includes 4 Chassis Boxes, 4 Panel/Racks, and Power Supply) (Wooden Cabinets must be shipped air freight - approx $100)	450.00	450.00	
	MAN	Introduction to the Serge Modular Music System (Manual included with all system orders. If ordered separately, please enclose $2.50 for shipping.)	12.50		(new)

There is a 5% discount on orders over $2000, 10% on orders over $3000. All orders are F.O.B. San Francisco, so please include shipping charges (approximately $15 per panel). Excess will be refunded. All orders are shipped via United Parcel Service within the U.S. Overseas orders are shipped via Air Freight (about $45 per panel). California residents please include 6 1/2% sales tax.

Delivery times range from 2 to 8 weeks. Contact us for current delivery schedules.