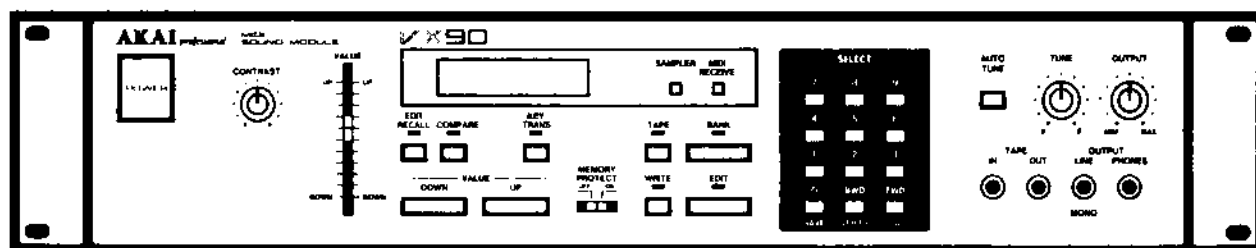


AKAI

professional

VX90

MIDI SOUND MODULE



WARNING

To prevent fire or shock hazard, do not expose this appliance to rain or moisture.

Operator's Manual

Warning

Power requirements

Power requirements for electrical equipment differ from area to area. Please ensure that your machine meets the power requirements in your area.

If in doubt, consult a qualified electrician.

120 V, 60 Hz for USA and Canada

220 V, 50 Hz for Europe except UK

240 V, 50 Hz for UK and Australia

What you should know to protect yourself and the Akai VX90.

Watch out! You might get an electric shock.

- Never touch the plug with wet hands.
- Always pull out by the plug and never the cord.
- Only let a qualified professional repair or reassemble the equipment. An unauthorized person might touch the internal parts and receive a serious electric shock.
- Never allow a child to put anything, especially metal, into the equipment.

Let's protect the Akai VX90 too.

- Use only a household AC power source. Never use a DC power source.
- If water is spilled on the equipment, disconnect it and call your dealer.
- Make sure that the equipment is well ventilated and away from direct sunlight.
- To avoid damage to the internal circuits and the external surface, keep away from heat (stoves, etc.).
- Avoid using spray type insecticide near the equipment. It can damage the finish and might ignite suddenly.
- To avoid damaging the finish, never use denaturated alcohol, paint thinner or other similar chemicals to clean the equipment.
- Place the equipment on a flat and solid surface.

To enjoy the Akai VX90 for a long time, please read this operator's manual thoroughly.

Should a problem persist, write down the model and serial numbers and all pertinent data regarding warranty coverage as well as a clear description of the existing trouble. Then, contact your nearest authorized Akai Service Station, or the Service Department of Akai Electric Company, Tokyo, Japan.

Precautions

FOR CUSTOMERS IN THE UK

IMPORTANT FOR YOUR SAFETY

The flex supplied with your machine will have two wires as shown in the illustration.

TWO CORE FLEX IMPORTANT

The wires in this mains lead are coloured in accordance with the following code:

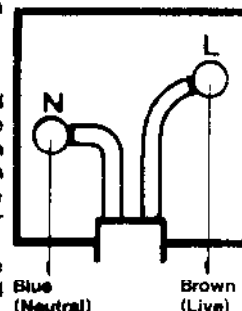
Blue: Neutral

Brown: Live

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows: The wire which is coloured blue must be connected to the terminal which is marked with the letter N or coloured black.

The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured red.

- Do not connect any wire to the larger pin marked E or $\perp$ when wiring a plug. Ensure that all terminals are securely tightened so that no loose strands of wire exist.





CAUTION

RISK OF ELECTRIC SHOCK
DO NOT OPEN



CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK,
DO NOT REMOVE COVER (OR BACK).
NO USER-SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



- The lightning flash with the arrowhead symbol superimposed across a graphical representation of a person, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure; that may be of sufficient magnitude to constitute a risk of electric shock.



- The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Features

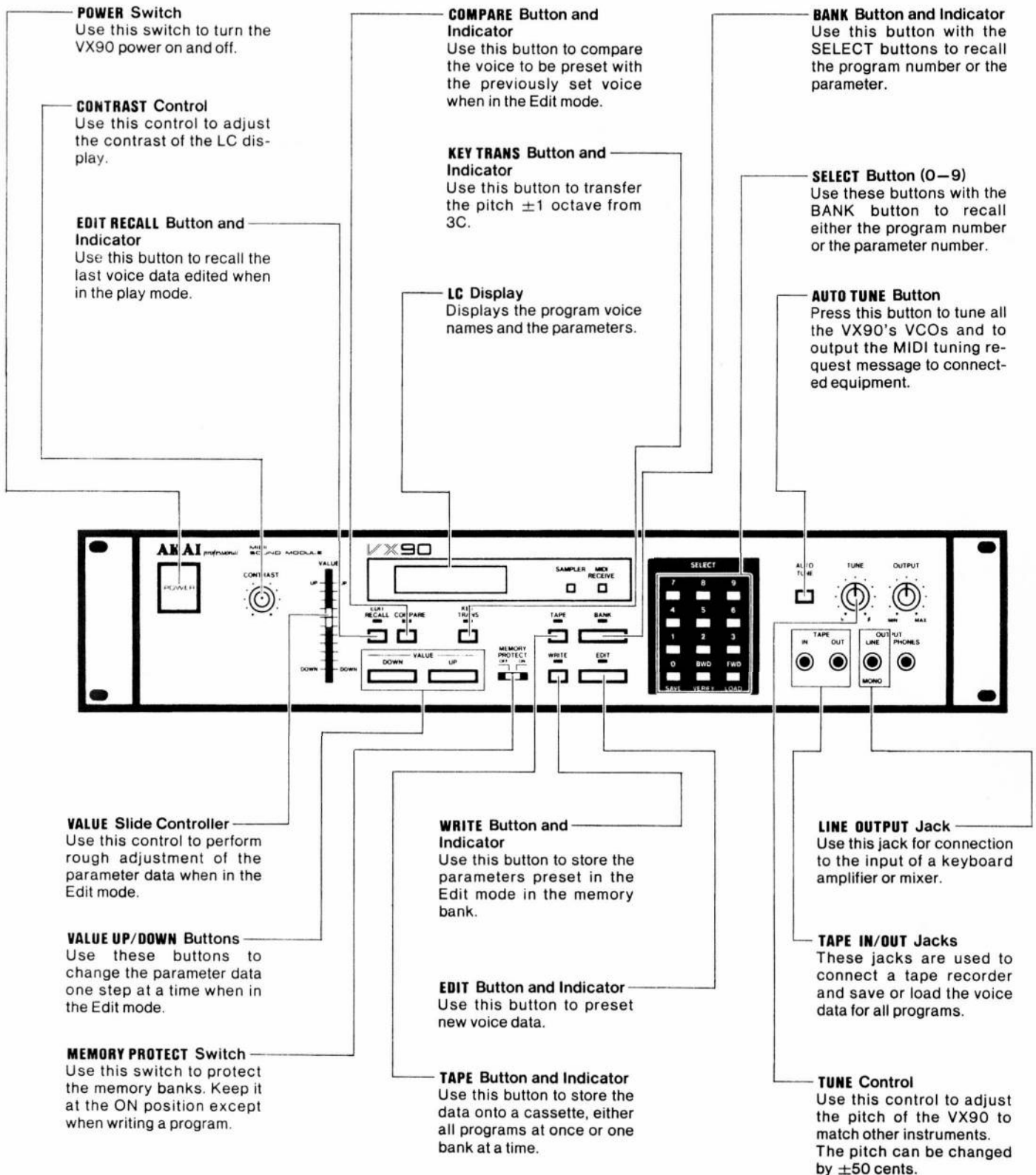
The VX90 is a 6-voice rack mount type MIDI sound module.

1. Up to 100 types of voice data can be stored in the internal memory.
2. The VX90 can be used for analog synthesizer type editing when connected to an AKAI sampler (the S612 for example). Furthermore, the VX90 is equipped with a sampler IN jack making it possible to mix the VX90's sound source (VCOs) with the sampler sound source.
3. The voice name can be written in up to 12 letters on the display when voice data has been edited.

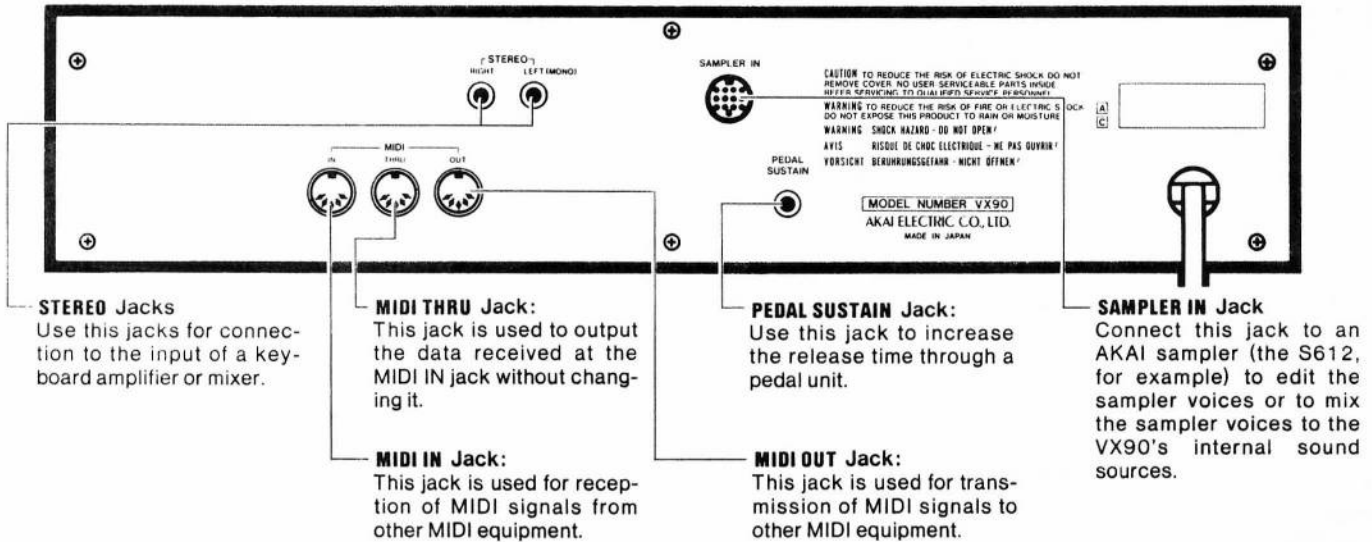
Table of contents

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Controls	3
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Parameters	8
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Controls



Rear Panel

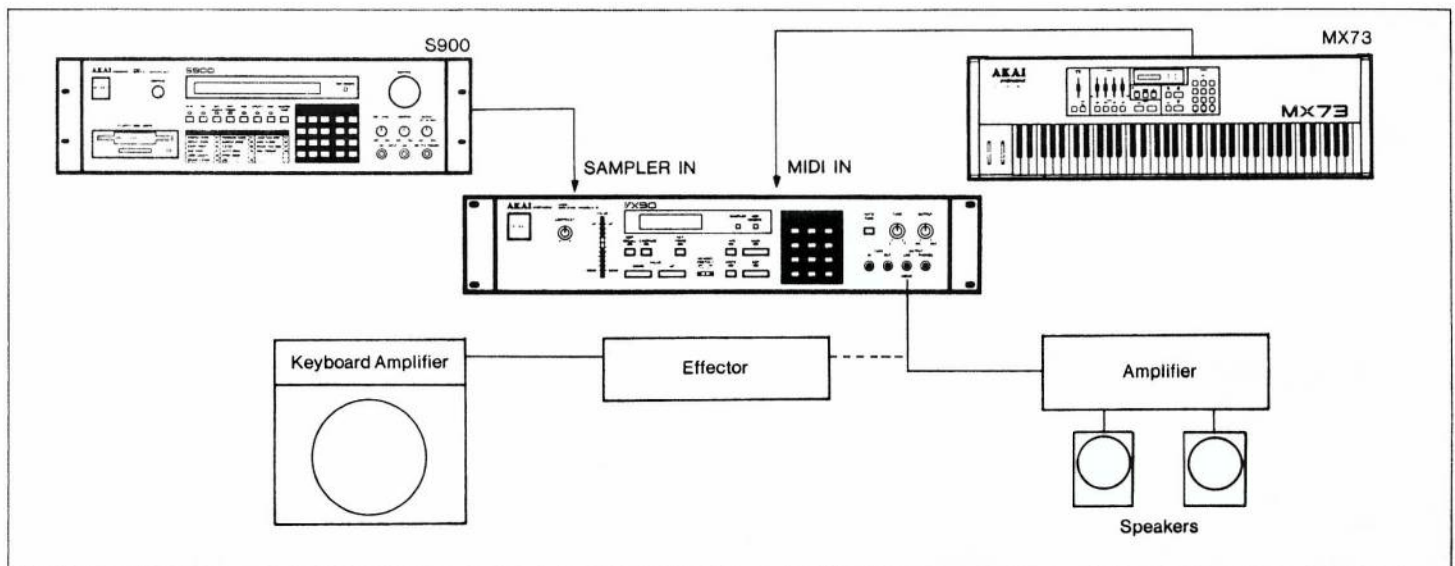


Connections

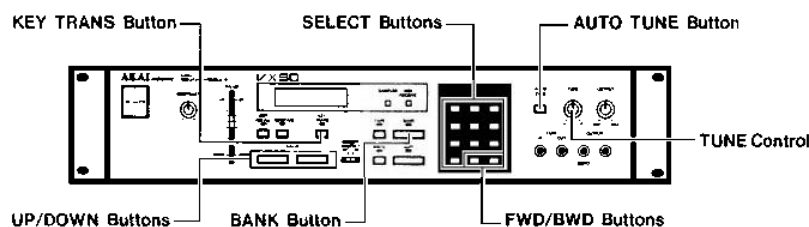
- The VX90 can be operated by such MIDI equipment as a MIDI sequencer or a MIDI master keyboard or any keyboard.
- As the VX90 is not equipped with a built-in amplifier or speakers, a separate power amplifier (a keyboard amplifier for example) and instrument speakers are needed.

Before Making Connections

- Be sure the power is off, or connect the power cord last.
- Insert the plugs firmly into the jacks. Poor connections will result in noise or distortion.
- Hold the plug when disconnecting. Pulling on the cord will damage it.



Operation



PLAY MODE

- Turn the POWER switch on. The display will read "P00:STRINGS 1".

P00:STRINGS 1

Program Selection

- The preset voices consist of ten banks of ten voices each for a total of 100 voices. (Refer to Page 12 for a list of the voices.)
1. Press the BANK button. (The LED will light.)
 2. Use the SELECT buttons to choose a program number.
 3. The program number can also be changed one step at a time by pressing the FWD/BWD buttons.

TUNE Control

- Use the TUNE control to adjust the pitch to the same level as other instruments. The pitch can be changed by ± 50 cents ($\pm 1/4$ tone).

AUTO TUNE Button

- Tunes all the VX90's VCOs and VCFs.
- When connected to other MIDI instruments, sends a tune request message to the slave side.

NOTE: This only functions when the instrument on the slave side is equipped with the tune request function.

1. Press the AUTO TUNE Button. "AUTO TUNE" will appear on the display.
2. Once tuning is completed, the "AUTO TUNE" display will go off and the previous display will reappear.

NOTE: The time required for auto tuning on the slave side may differ.

《AUTO TUNE》

KEY TRANS Button

1. Perform the following procedures with the KEY TRANS button depressed. (The LED will light.)
 2. Press the UP/DOWN buttons to transpose to that key.
 3. When the KEY TRANS button is pressed again, the LED turns off, the transposal is cancelled, and the musical key returns to 3C.
 4. Press the KEY TRANS button to recall the key set in step 2 above.
- The range for key transposal is ± 1 from octave from 3C. (2C–3C–4C)

TRANPOSE C

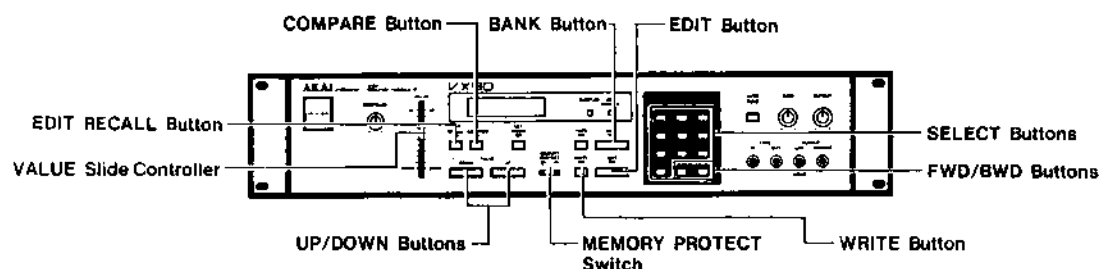
Turning Sustain On and Off Using a Foot Pedal

- Use this function to hold the release time using a pedal unit.

Edit Mode

Edit Mode

- The Edit mode is used to change voice data stored in the memory to create new voice data.



Basic Editing Operation

- Use the BANK button and SELECT buttons to choose the program number.
- Press the EDIT button. (The LED will light.)
- Use the BANK button and SELECT buttons to choose the parameter to be changed. The parameters can also be recalled by using the FWD/LOAD and BWD/VERIFY buttons. Input the data by using the slide controller or the UP/DOWN buttons.

VALUE Slide Controller

Use this controller for rough adjustment of the data.

UP/DOWN Buttons

Use these buttons to change the data one step at a time. Use the UP button to turn a parameter on and the DOWN button to turn it off.

Program Writing

- Programs which have been set can be stored in the memory at program numbers 00–99.
- Press the EDIT button to set the unit to the Edit mode.
 - Set the MEMORY PROTECT switch to the OFF position.
 - With the WRITE button depressed, press the BANK button (the LED will light), then set the bank number using the SELECT buttons.

PROGRAM NO:--

PROGRAM NO:12

(Example: Storing at program number 12)

When the WRITE button is released, the LED will turn off. Press the EDIT button (the LED will turn off) and set to the Play mode.

- The “—” mark will appear on the display at this time. This is to protect the voice data stored at this program number. When any SELECT button is pressed, “—” changes to “:”, the edited voice is stored at this program number, and the previous voice is erased.

P00→

P00:

Comparing

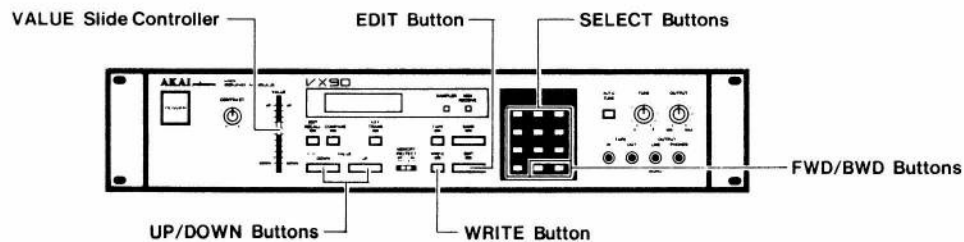
- During the Edit mode, the COMPARE button can be used to compare the preset voice with the voice being edited.
 - The previous voice can be checked while creating a new sound.
- Press the COMPARE button. (The LED will light.) The unit is set to the voice set before the parameters were changed. The parameter on the display changes from E to C.
 - When the COMPARE button is pressed again, the LED will turn off and the unit will return to the edited voice.

Edit Recall

- Voice data (the last voice data edited) can be recalled by pressing the EDIT RECALL button during the Edit mode. The edit recall function provides convenience for recalling a voice you wish to continue editing in the following instances:
 - When the unit is accidentally set to the Play mode during editing.
 - When the unit is set to the Play mode during editing to compare the voice with other voices in the memory.
 - When the unit is set to the Play mode to search for an unnecessary voice to write edited voice data in the memory.
- When the EDIT RECALL button is pressed after the COMPARE button in the Edit mode, the voice for which the COMPARE buttons was pressed is recalled.

7

Setting Voice Names



Edited voice data can be given any name using up to 12 letters.

1. Press the EDIT button. (The LED will light.)
2. Set the MEMORY PROTECT switch to the OFF position.
3. Next press the BANK button and use the SELECT buttons to set to parameter E80.

E80: _

4. Use the UP/DOWN buttons or the slide controller to set letters A—Z or numbers 0—9.

E80: P

5. Press the FWD button to move the cursor, then press the UP/DOWN buttons or the slide controller to set the next letter (or number).

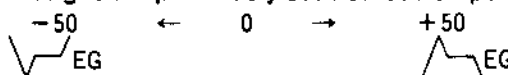
E80: P I

6. Repeat steps 4 and 5 to set the voice name.

E80: P I A N O

7. Next, with the WRITE button depressed, choose the program number under which you wish to set the voice name. The edited voice data has now been given a name.

Parameters

Display			
Parameter		Data	Description
E00	VCOaOCT (Octave)	2', 4', 8', 16'	Switches the pitch. 8' is the basic pitch. When set to 16' or 4', the range changes by one octave.
E01	VCOaWF (Wave Form)		Switches the output waveform.
E02	VCOaPW	0~100	Sets the pulse width. However, operates at waveform selected by E01.
E03	VCOaPWMS	0~100	Sets the PWM depth depending on the pulse wave set by E02 VCOaPW. (NOTE: When E02 is "0", there is no PWM.) This adjusts the PWM speed.
E04	VCOaEG	0~100	Makes it possible to set EG for the VCOs.
E05	NOISE b	OFF/ON	Pink noise is output when "ON".
E06	SAMPLER b	OFF/ON	When AKAI sampler (S-612, etc.) is connected, it can be used as a sound source for the VX90.
E07	a—b BAL (BALance)	0~100	Adjusts output level balance between VCO(a) and NOISE and SAMPLER(b). When "0", only VCO(a) sound is produced, and when "100", only NOISE and SAMPLER(b) sound is produced.
E10	VCF FREQ (Cutoff FREQuency)	0~100	Adjusts the VCF cut-off frequency.
E11	VCF RESO (RESOnance)	0~100	Allows reinforcement of the cut-off point area determined by E10 VCF FREQ (cut-off frequency).
E12	VCF OWFM (Oscillator Wave Form Modulation)	0~100	Oscillator waveform modulation. Adds modulation from the VCOs to the VCFs depending on the waveform selected by E10.
E13	VCF EG	-50~0~+50	Controls the VCF cut-off frequency by EG signal, and changes the previously set VCF cut-off point. 
E14	VCF KEYF (KEYboard Follow)	0~100	Changes the cut-off frequency depending on the keyboard position. Adjusts the degree of this change.
E15	VCF VELO (VELOcity)	-50~0~+50	Adjusts the amount of E13 VCF control by the speed at which the key is struck. (NOTE: When VCF EG is "0", VCF VELO effect is "0".)
E16	HPF (High Path Filter)	0~100	Adjusts the amount of low frequency which passes.

E20	EG SEL (Mode SElect)	A ≠ F, A = F	I. When A ≠ F, the EG effect acts on VCA for E21 – 24 and the EG effect acts on VCO and VCF for E25 – 28. (Refer to I) II. When A = F, the EG effect acts on VCA and VCF for E21 – 24 and on VCO for E25 – 28. (Refer to II)
I.			
E21	EGA A (Attack)	0 ~ 100	Sets the VCA attack time.
E22	EGA D (Decay)	0 ~ 100	Sets the VCA decay time.
E23	EGA S (Sustain)	0 ~ 100	Sets the VCA sustain level.
E24	EGA R (Release)	0 ~ 100	Sets the VCA release time.
E25	EGOF A	0 ~ 100	Sets the VCO and VCF attack time.
E26	EGOF D	0 ~ 100	Sets the VCO and VCF decay time.
E27	EGOF S	0 ~ 100	Sets the VCO and VCF sustain level.
E28	EGOF R	0 ~ 100	Sets the VCO and VCF release time.
II.			
E21	EGAF A	0 ~ 100	Sets the VCA and VCF attack time.
E22	EGAF D	0 ~ 100	Sets the VCA and VCF decay time.
E23	EGAF S	0 ~ 100	Sets the VCA and VCF sustain level.
E24	EGAF R	0 ~ 100	Sets the VCA and VCF release time.
E25	EGO A	0 ~ 100	Sets the VCO attack time.
E26	EGO D	0 ~ 100	Sets the VCO decay time.
E27	EGO S	0 ~ 100	Sets the VCO sustain level.
E28	EGO R	0 ~ 100	Sets the VCO release time.
E30	VCA LEV (LEVel)	0 ~ 100	Sets the Final VCA output level.
E31	VCA VELO (VELOcity)	-50 ~ 0 ~ +50	Adjusts the degree to which the VCAs are controlled by the strength at which the key is struck.
E40	LFO SEL	OFF, VCO, VCF, VCA	Makes it possible to apply LFO to either the VCOs, VCFs, or VCAs.
E41	LFO WF (Wave Form)	N, A, Δ, □, RNDM	Makes it possible to select the LFO waveform.
E42	LFO FREQ (FREQuency)	0 ~ 100	Adjusts the LFO change speed.
E43	LFO DP (Depth)	0 ~ 100	Sets the depth of frequency modulation.
E44	LFO DEL (DELay)	0 ~ 100	Adjusts the time required from when a key is pressed until the effect is produced.
E45	CHORUS	OFF, 1, 2	Applies the stereo chorus effect.

E50	ASSIGN	POLY,DUAL,UNI	Sets to 6 chords in the POLY mode, 3 chords in the DUAL mode, and 1 chord in the UNI (unison) mode.
E51	SOL PORT (PORTament)	0~100	Applies the portamento effect in the DUAL or UNI (unison) modes.
E52	DETUNE	0~100	Applies the effect in the DUAL or UNI (unison) modes. Richness and softness can be added to the sound by slightly changing the VCO frequency.
E60	WH BND O (Pitch BeND Range, VCO)	0~12	Makes pitch variable in semi-tone steps. At "12", the pitch is variable by ± 1 octave.
E61	WH BND F (Pitch BeND Range, VCF)	0~100	Makes the cut-off frequency variable.
E62	WH MOD (MODulation level)	0~100	Makes the LFO modulation variable. * When "0", LFO is not applied when the modulation wheel is operated.
E72	MIDI CH	1~16	Makes MIDI CH. selection possible.
E73	MIDI PC (Program Change)	ENA,DIS	When set at ENA (enable), the MIDI program change data can be transmitted or received. When set at DIS (disable), the data cannot be transmitted or received.
E80	LABEL	A~Z, 0~9, [SPACE], Etc	Makes it possible to input a voice name in up to 12 letters. The cursor is moved by the FWD/BWD buttons, and the letters are selected by the slide controller or the UP/DOWN buttons. (Refer to Page 7)

* The E72 MIDI CH and E73 MIDI PC are common for all 100 programs.

Tape Interface

SAVE/VERIFY/LOAD

The VX90 is equipped with an input and output jack and tape interface functions making it possible to store the parameters set in the program memory on a cassette tape. The tape interface functions include the save mode for outputting the program parameters and recording them on a cassette tape, the verify mode for checking whether the parameters recorded on the tape are correct, and the load mode for resetting the parameters recorded on the tape back onto the VX90. The programs can be saved, verified, or loaded either one bank at a time or all at once (0 to 99).

- It is advisable to use the same cassette tape and recorder for both recording and playback.
- Do not subject the cassette recorder to shock or vibration when saving or loading, as this will make it impossible to save or load the parameters correctly.
- It is advisable to save two copies of the same parameters (one for backup) in case for some reason one is destroyed.
- It is not advisable to copy the parameters from one tape recorder onto another, as it is sometimes not possible to make correct copies.

CONNECTIONS

Connect a cassette recorder to the VX90 TAPE IN/OUT jacks.

PROCEDURE

- Saving (Verifying, Loading)

1. Set the connected tape recorder to the record mode. (Play back mode for Verifying and Loading)
2. Press the TAPE button. (The LED will light.)

TAPE:SELECT S,V,L

3. Press the SAVE (VERIFY, LOAD) button.
"TAPE: SAVE ALL" will appear on the display, indicating that it is possible to save all the programs.

TAPE:SAVE ALL

4. To save only one bank, press the UP or DOWN button to select the bank number.

TAPE:SAVE 9

5. Press the SAVE (VERIFY, LOAD) button. "TAPE: SAVE START" will appear on the display, and counting will start after several seconds.

TAPE:SAVE START

6. "SAVE END" will appear on the display when all the data has been saved. (In the verify mode, "GOOD" will be displayed.)

TAPE:SAVE END

If there is an error in the verify mode, change the tape recorder's output level and perform the verify operation several times. If there is still an error, change the tape and save the voice data. Also fill in the data for the parameters on a data sheet. If data is for some reason destroyed, use this data sheet and reset the same voice data.

Voice Chart

Program Number	Voice Name	Program Number	Voice Name
00	STRINGS 1	50	MR BASS
01	BRASS	51	MICRO BASS
02	PIANO	52	MINI BASS
03	SYN CLAV 1	53	PIT BASS
04	CLAVITAR	54	BASS
05	MR BASS	55	STEEL DRUM 1
06	WIND SYN	56	STEEL DRUM 2
07	ELECTRICITY	57	SCREAMER
08	STEEL DRUM 1	58	DUAL
09	PROFIT \$	59	LEAD 2
10	PIANO 1	60	VIBE HARP
11	SYN PIANO A	61	SYN HARP 1
12	ELEC PIANO	62	SYN HARP 2
13	SYN PIANO	63	MALLET
14	TOY PIANO	64	CELLESTE
15	PIANO 3	65	OBI KHANOBE
16	ROCKY ROAD	66	MUSIC BOX
17	SYN PIANO	67	STEEL DRUM 1
18	FM PIANO	68	STEEL DRUM 2
19	PIANO 1A	69	HARMONIUM
20	STRINGS 1	70	FUNKY ORGAN
21	CELLO 1	71	FLUTE
22	STRINGS 3	72	RECORDER
23	CELLO BOW	73	ORGAN 1
24	STRGS + HORN	74	ORGAN 2
25	STRINGS 1A	75	PICCOLO
26	STRING FLUTE	76	GLASS ORGAN
27	ORCHESTRA	77	CHURCH ORGAN
28	LOW STRINGS	78	WHISTLE
29	HEAVEN	79	WOODWINDS
30	FRENCH HORN	80	LEAD 1
31	FRENCH HORN 2	81	AHS MALE
32	HIGH HORNS	82	CLAVITAR
33	SYN BRASS 1	83	CELLESTE
34	SYN BRASS 2	84	MUSIC BOX
35	HORNS 1	85	CLASSIC
36	HORNS 3	86	TRUMPET
37	SYN BRASS 3	87	OBI KHANOBE
38	SECTIONAL	88	SYN PIANO A
39	HOPEFULL	89	WOODSYNTH
40	SYN CLAV 1	90	SAMPL + HOLD
41	SYN CLAV 2	91	INDUSTRIAL
42	FANCY CLAV	92	PHASER
43	SYNFUL	93	DEPATCH MODE
44	RUST BELT	94	HEAVEN
45	PHASER	95	CELLO
46	CHAMBER 1	96	STRINGS 1
47	CHAMBER 2	97	HORN 3
48	HARMONIUM	98	QUINCY \$
49	DEPATCH MODE	99	WIND SYN

Specifications

Voice Range: 24—120 (C1—C9)

Voices: 6

Tone generator: VCO (voltage controlled oscillator)

Internal memory: 100 programs

External Memory: Cassette interface

Parameters:

VCO Section:

Octave (2', 4', 8', 16')

Waveform ($\wedge$, $\wedge$, $\square$, $\wedge + \wedge$)

Pulse width control

PWM speed control

EG depth control

Sampler ON/OFF

Noise ON/OFF

A-B balance control

VCF Section:

Cut-off frequency control

Resonance control

Key follow control

VCO modulation control

HPF control

EG depth and polarity switching (+/-)

Key velocity control

EG Section:

Attack time

Delay time

Sustain level

Release time

EG switching (VCF, VCA, VCF=VCA, VCA GATE)

VCA Section:

Level

Velocity

LFO Section:

LFO switching (VCO, VCF, VCA)

Waveform ($\wedge$, $\wedge$, $\square$, $\square$, RND)

Depth control

Speed control

Delay control

Chorus (OFF, 1, 2)

Key assign (POLY, UNISON)

Bend: VCO (± 1 octave)

Cut-off frequency (MIN—MAX)

Modulation depth (MIN—MAX)

MIDI channel (1—16)

Functions:

Output level control

Tune control (± 50 cents)

Auto tune ON/OFF

Key transpose ON/OFF

Memory protect ON/OFF

LCD contrast control

Edit control

Value control volume

Value UP/DOWN key

Edit recall ON/OFF

Compare ON/OFF

Edit

Write

Bank

Ten key

FWD/LOAD key

BWD/VERIFY key

O/SAVE key

Display:

LC display, LED

External Jacks:

MIDI (IN, OUT, THRU)

Sampler IN (13 PIN/DIN)

LINE OUT (MONO) $\times 1$

STEREO OUT/LEFT (MONO), RIGHT

Headphone $\times 1$

Tape (LOAD/IN, SAVE/OUT)

Dimensions: 482.6 (W) $\times$ 88.1 (H) $\times$ 367 (D) mm

(EIA Rack mount/2U)

Weight: 6.0 kg

- For improvement purposes, specifications and design are subject to change without notice.

[MIDI Sound Module]
 Model VX - 90 MIDI Implementation Chart Version :1.0

Function ...	Transmitted	Recognized	Remarks
Basic Default Channel Changed	1 - 16 1 - 16	1 - 16 * 1 - 16 *	* memorized
Mode Default Messages Altered	MODE 3, MODE 4 *****	MODE 3 X X	memorized
Note Number : True voice	24 - 96 *****	0 - 127 24 - 120	
Velocity Note ON Note OFF	X 9nH V=1-127 X 9nH V=0 ,8nH	O O	
After Key's Touch Ch's	X X	X X	
Pitch Bender	X	O	7 bit RESO
Control 1 Change 7 64	X X X	O O O	Modulation wheel Volume Sustain foot sw
Prog Change : True #	O 0 - 99 *****	O 0 - 127 0 - 99	
System Exclusive	X	X	
System : Song Pos : Song Sel Common : Tune	X X O	X X O	
System :Clock Real Time :Commands	X X	X X	
Aux :Local ON/OFF :All Notes OFF Mes- :Active Sense sages:Reset	X O X X	X O X X	
Notes			

Mode 1 : OMNI ON, POLY
 Mode 3 : OMNI OFF, POLY

Mode 2 : OMNI ON, MONO
 Mode 4 : OMNI OFF, MONO

O : Yes
 X : no

No	Parameter	Range	No	Parameter	Range
00	VCOaOCT	2' - 16'	25	EGO (F) A	0 - 100
01	VCOaWF	1, ^, n, 1+^	26	EGO (F) D	0 - 100
02	VCAaPW	0 - 100	27	EGO (F) S	0 - 100
03	VCOaPWMS	0 - 100	28	EGO (F) R	0 - 100
04	VCOaEG	0 - 100			
05	NOISEb	OFF - ON	30	VCA LVL	0 - 100
06	SAMPLERb	OFF - ON	31	VCA VELO	-50 - +50
07	a - b BAL	100 - 0			
			40	LFO SEL	OFF, VC(0,F,A)
10	VCF FREQ	0 - 100	41	LFO WF	1, ^, n, RND
11	VCF RESO	0 - 100	42	LFO FREQ	0 - 100
12	VCF OWFM	0 - 100	43	LFO DP	0 - 100
13	VCF EG	-50 - +50	44	LFO DEL	0 - 100
14	VCF KEYF	0 - 100	45	CHORUS	OFF, 1, 2
15	VCF VELO	-50 - +50			
16	HPF	0 - 100	50	ASSIGN	POLY, DUAL, UNI
			51	SOL PORT	0 - 100
20	EG SEL	A#F, A=F	52	DETUNE	0 - 100
21	EGA (F) A	0 - 100			
22	EGA (F) D	0 - 100	60	WH BND 0	0 - 12
23	EGA (F) S	0 - 100	61	WH BND F	0 - 100
24	EGA (F) R	0 - 100	62	WH MOD	0 - 100
70	MIDI CH	0 - 16			
71	MIDI PC	ENA, DIS	80	NAME	