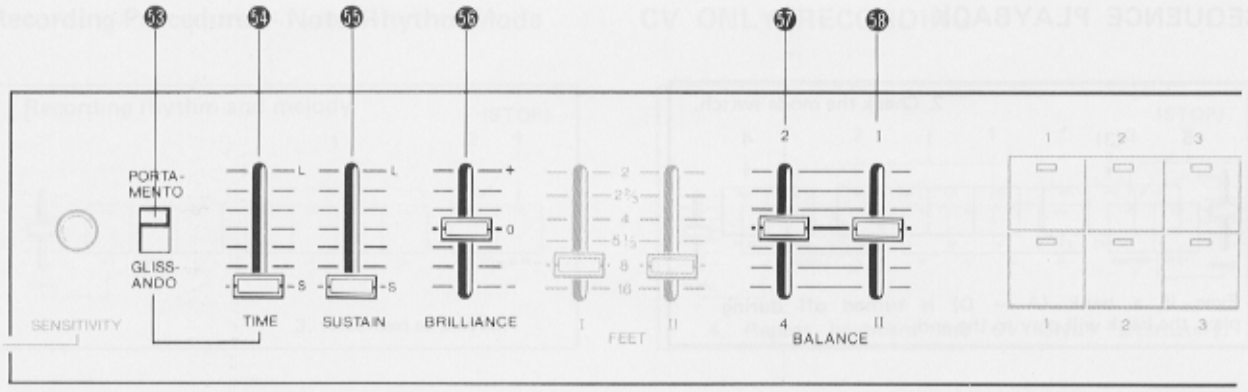


While the basic tonal quality of the CS70M is determined by the programmable controls, various non-programmable "real-time" controls are provided for additional modulation, filter, volume, and several special effects. (For the FEET switch, ⑫, see page 14).

⑬ PORTAMENTO/GLISSANDO

This switch selects either **PORTAMENTO** or **GLISSANDO.** Portamento is a smooth "slide" from one note or notes to another, whereas glissando gives a half-step at a time pitch change, like playing a chromatic scale. In the **SPLIT** mode, portamento and glissando are not in effect on either the lower part of the keyboard, or on the sequencer, if it is in playback.

⑭ TIME lever

This lever adjust the rate of change of the pitch effected by either **PORTAMENTO** or **GLISSANDO.** As the lever is moved toward the "L", this change become slower.

If you do not wish to have any **PORTAMENTO** or **GLISSANDO,** this lever should be set all the way to "S". If a foot switch (FC-4) is connected to the **PORTAMENT** jack on the rear panel, the portamento or the glissando effect can be turned on and off via this switch, and the rate can be controlled by the **TIME** lever.

⑮ SUSTAIN lever

The **SUSTAIN** allows the player to extend the time for the notes to decay after releasing the keys beyond that set by the **RELEASE** lever of the **VCA** block. Because this is a real-time control, release can be controlled quickly and easily to suit the musical situation. As the lever is moved toward "L", the sustain time becomes longer.

If a foot switch (FC-4) is connected to the **FOOT SW SUSTAIN** jack on the rear panel, the sustain effect can be turned on and off with the **SUSTAIN** lever controlling the release time. To turn off the effect when not using the foot switch, move the lever all the way to "S".

⑯ BRILLIANCE lever

The **BRILLIANCE** allows fine adjustment during performance of the **VCF** cutoff frequency. Just like the **CUTOFF FREQ** lever in the **VCF** block, moving the lever upwards (towards the "+") raises the cutoff frequency, giving a brighter tone richer in harmonics. During programming of voices in the **MANUAL** or **EDIT** modes, it recommended to keep the **BRILLIANCE** lever in the center, zero position.

Note that the **BRILLIANCE** lever effects the tonal quality of both channels.

Note that the **BRILLIANCE** lever works in the same manner as the **VCF CUTOFF FREQ** control, therefore it adjusts the tonal quality of the sound according to the **VCF** mode – **LOWPASS, BANDPASS,** or **HIGHPASS.**

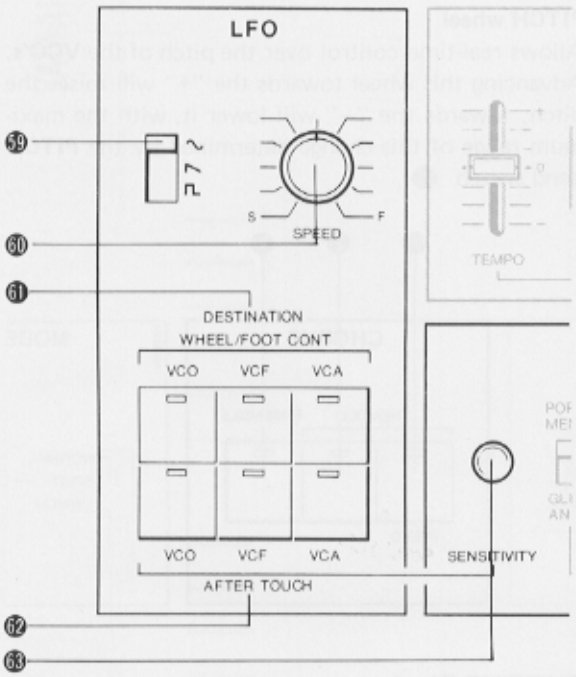
BALANCE lever

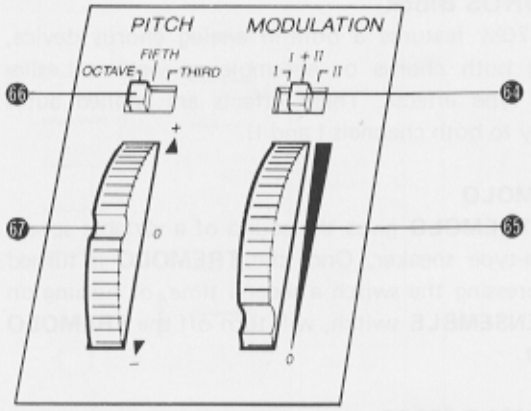
⑰ 2/4 SPLIT BALANCE lever

This control adjust the relative volume between the 2-note and the 4-note portions of the sound when in the **SPLIT** mode, or between the sequencer playback and manual play when the sequencer is in **PLAY.** Note also that this lever operates as indicated regardless of the position of the 2/4 switch.

⑱ CHANNEL I/II BALANCE lever

This control adjust the relative volume between the **CHANNEL I** and **CHANNEL II** signals, and functions the same whether you use the **MIXED** or separate output jacks (page 6).





*The real-time **LFO** and **PITCH/MODULATION** wheel blocks offer even further control of pitch and **LFO** modulation beyond that of the programmable controls, and allow modulation depth control in three different ways: **MODULATION** wheel, **FOOT CONTROLLER**, or **AFTER-TOUCH**.*

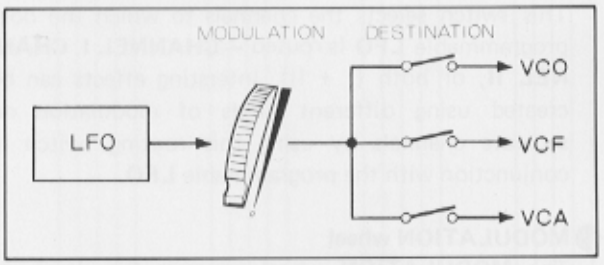
LFO

This block is full-function non-programmable **LOW FREQUENCY OSCILLATOR.** This **LFO** affects the sound of both channels, and can be used in conjunction with **LFO** modulation effects which have been programmed by the controls in the **PROGRAMMABLE LFO** block.

59 LFO Waveform Selector
This switch selects the type of waveform for different **LFO** modulation effects: sine, sawtooth, or square wave.

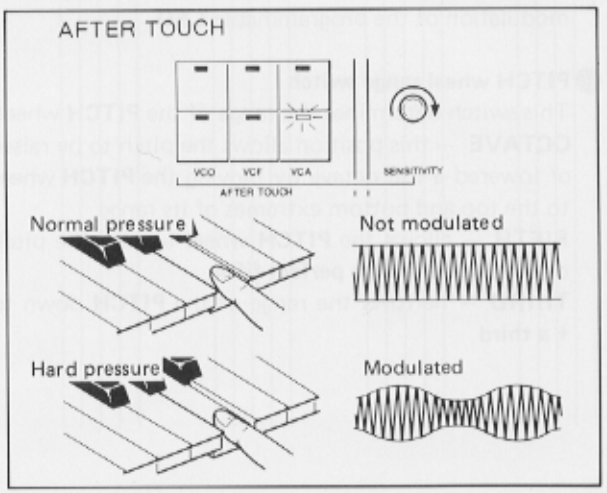
60 SPEED Control Knob
This controls the speed (frequency) of the **LOW FREQUENCY OSCILLATOR.** As the knob is turned from "S" to "F", the speed increases, with a range from 0.05 to 50 Hz.

61 DESTINATION (Wheel/Foot Control)
The **DESTINATION** switches determine the routing of the **LFO** signal. If the **VCO, VCF,** or **VCA** switch is pressed, the **LED** will light, indicating that the **LFO** is now modulating that block. Multiple destinations can be selected by pressing two or more of these switches. The modulation depth is controlled by means of the **MODULATION WHEEL,** or, if a foot controller is connected to the **MODULATION** jack on the rear panel, the wheel is disabled, and the depth of the **LFO** effect is determined by the foot controller.



AFTERTOUCH

The CS70M's **AFTER TOUCH** allows the performer control of **LFO** modulation effects while playing the



keyboard with both hands. After a note is struck, further pressure on the key will control the modulation depth (with the same effect as advancing the **MODULATION WHEEL**). This pressure can be applied to a varying degree, allowing very fine, fingertip control of the modulation depth.

62 DESTINATION (AFTERTOUCH)

These switches determine the routing of the **LFO** signal as applied by the **AFTERTOUCH,** and operate exactly like the **WHEEL/FOOT CONT DESTINATION** switches. Note that more than one destination may be selected for the **AFTERTOUCH** modulation effects.

63 SENSITIVITY

The **SENSITIVITY** control determines the range of modulation depth of the **AFTERTOUCH.** If this knob is turned clockwise, deeper **LFO** modulation will occur when aftertouch pressure is applied to the keys. Note the setting of the **MODULATION WHEEL** does not affect the **AFTERTOUCH** modulation.

64 MODULATION SWITCH

This switch selects the channels to which the non-programmable **LFO** is routed – **CHANNEL I, CHANNEL II,** or both (I + II). Intersting effects can be created using different kinds of modulation on separate channels by using this routing switch in conjunction with the programmable **LFO.**

65 MODULATION wheel

The **MODULATION** wheel controls the depth of **LFO** modulation to the blocks selected by the **DESTINATION** switches 61 and the **MODULATION** switch 64 . Note that if the **WHEEL** switch 41 is on, the wheel will also control the depth of modulation of the programmable **LFO.**

66 PITCH wheel range switch

This switch determines the range of the **PITCH** wheel.

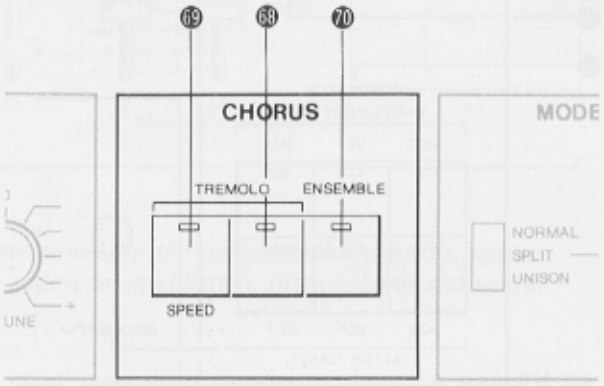
OCTAVE – this position allows the pitch to be raised or lowered a full octave by moving the **PITCH** wheel to the top and bottom extremes of its range.

FIFTH – allows the **PITCH** wheel to vary the pitch of the oscillators **+ a perfect fifth.**

THIRD – narrows the range of the **PITCH** down to **+ a third.**

67 PITCH wheel

Allows real-time control over the pitch of the **VCO's.** Advancing this wheel towards the "+" will raises the pitch, towards the "–" will lower it, with the maximum range of this change determined by the **PITCH** bend switch 66 .



■ CHORUS Block

The CS70M features a built-in analog chorus device, allowing both chorus or ensemble as well as Leslie-speaker type effects. These effects are applied automatically to both channels I and II.

68 TREMOLO

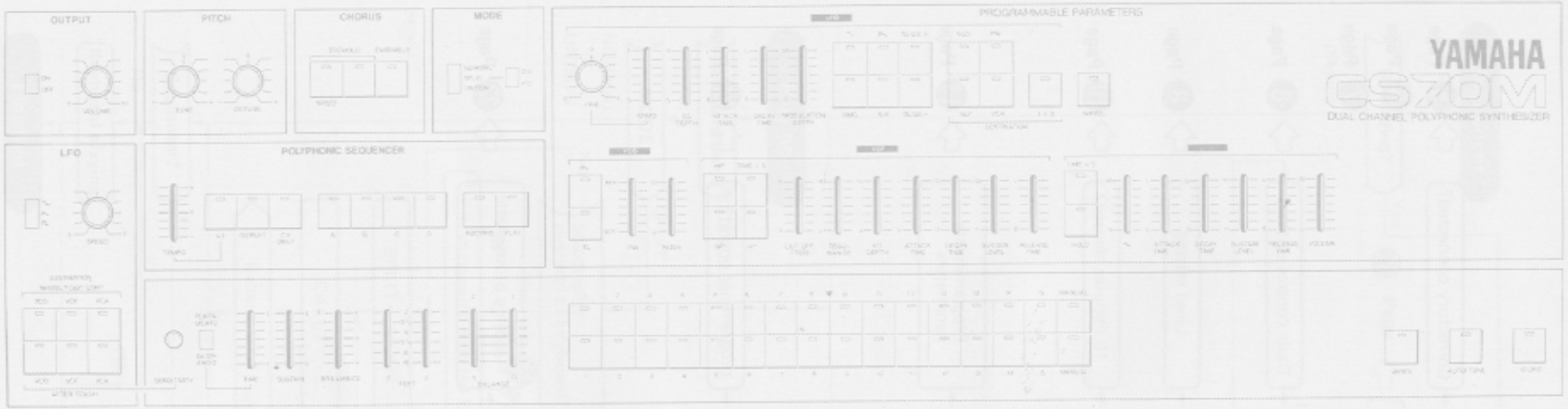
The **TREMOLO** gives the sound of a variable speed, Leslie-type speaker. Once the **TREMOLO** is turned on, pressing the switch a second time, or turning on the **ENSEMBLE** switch, will turn off the **TREMOLO** effect.

69 TREMOLO SPEED

This switch controls the apparent speed of the **TREMOLO** effect, just as the speed of Leslie speaker's rotation can be controlled. When this switch is pressed, the **LED** indicator will light and the speed of the **TREMOLO** effect will increase from slow to fast **gradually.** If the switch is pressed again (turning the indicator off), the speed will gradually decrease back to the "slow" rate.

70 ENSEMBLE switch

This switch gives a analog chorus type effect, and is especially useful for string voicings. This effect is turned on by pressing the **ENSEMBLE** switch, causing the indicator to light. If the switch is pressed again, or if the **TREMOLO** is turned on, it will be turned off.



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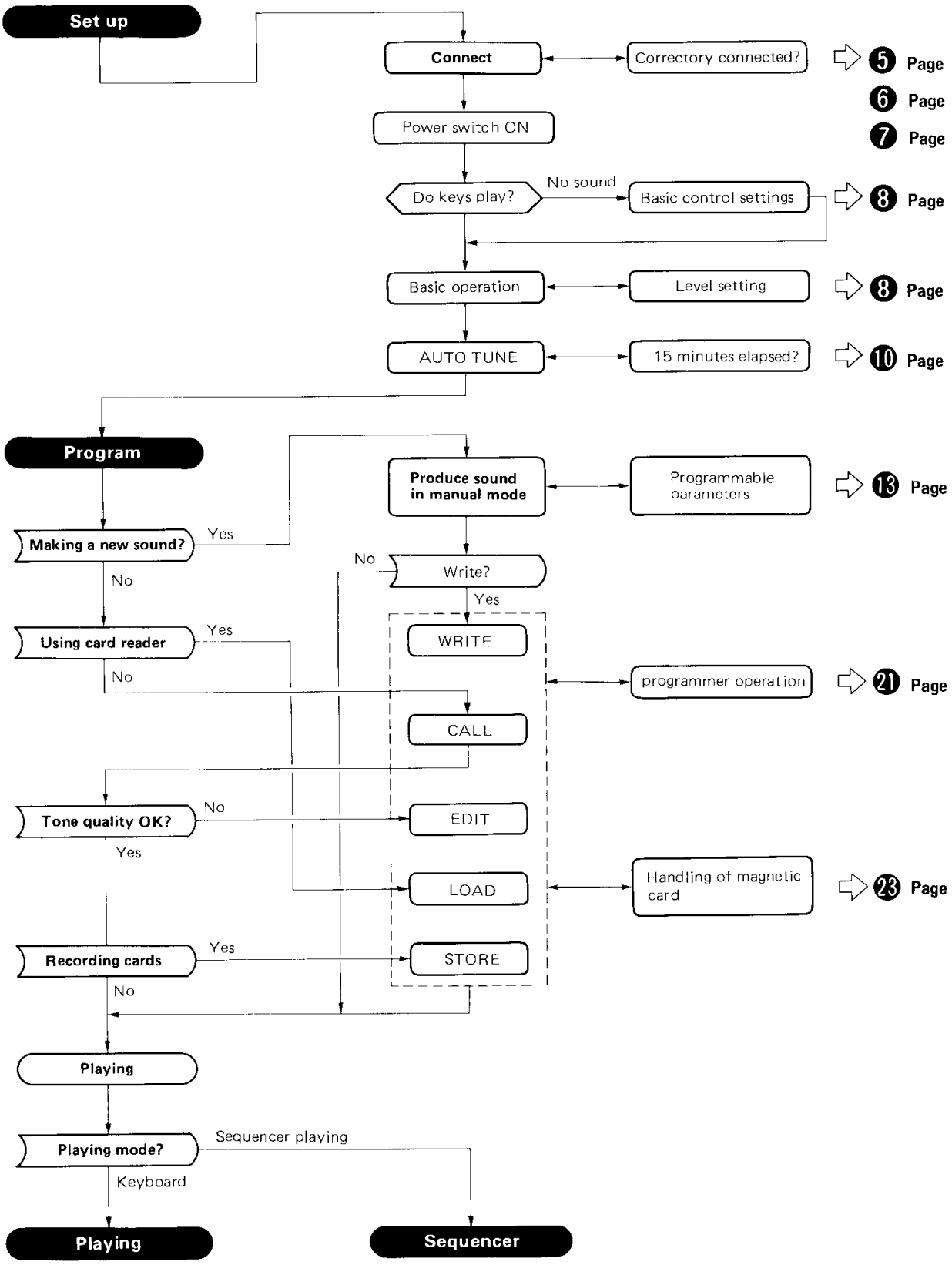
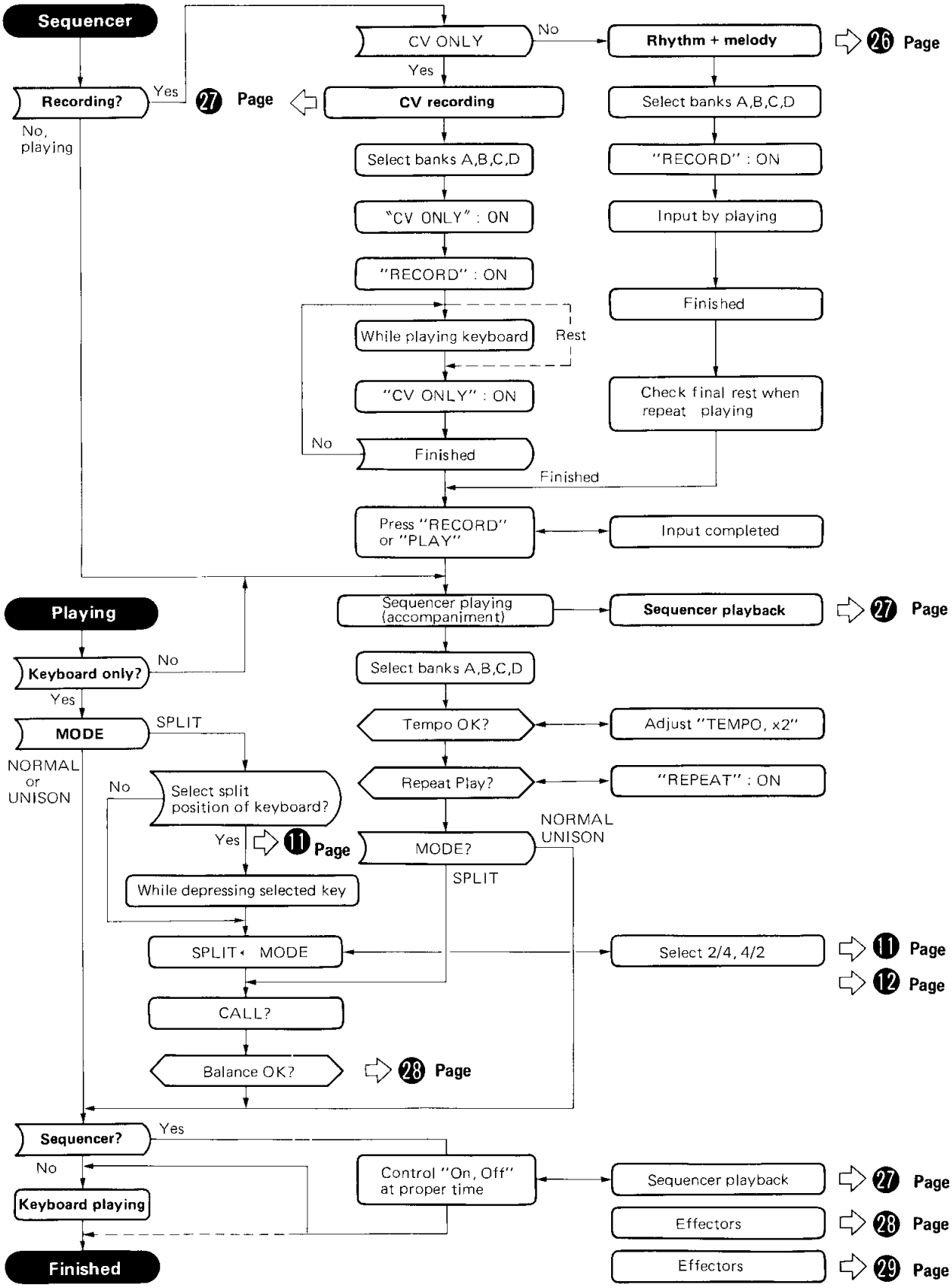
Sound Patch Chart

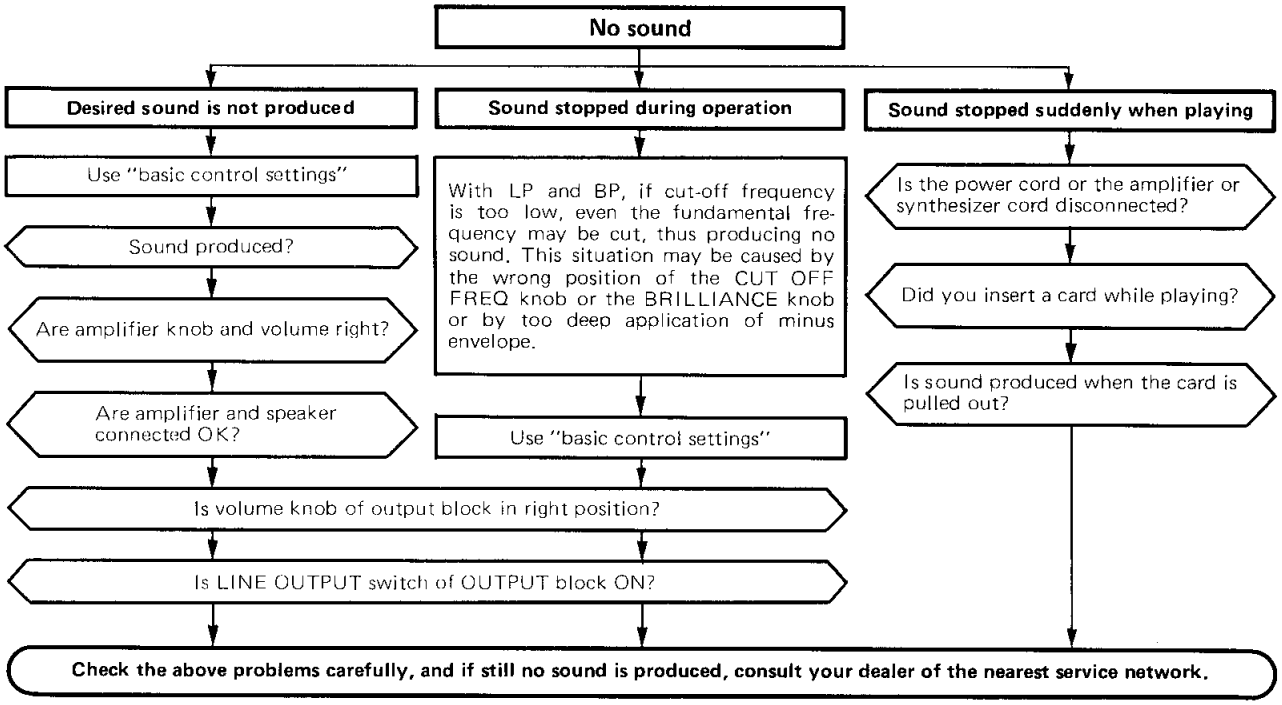
Summary of Operations

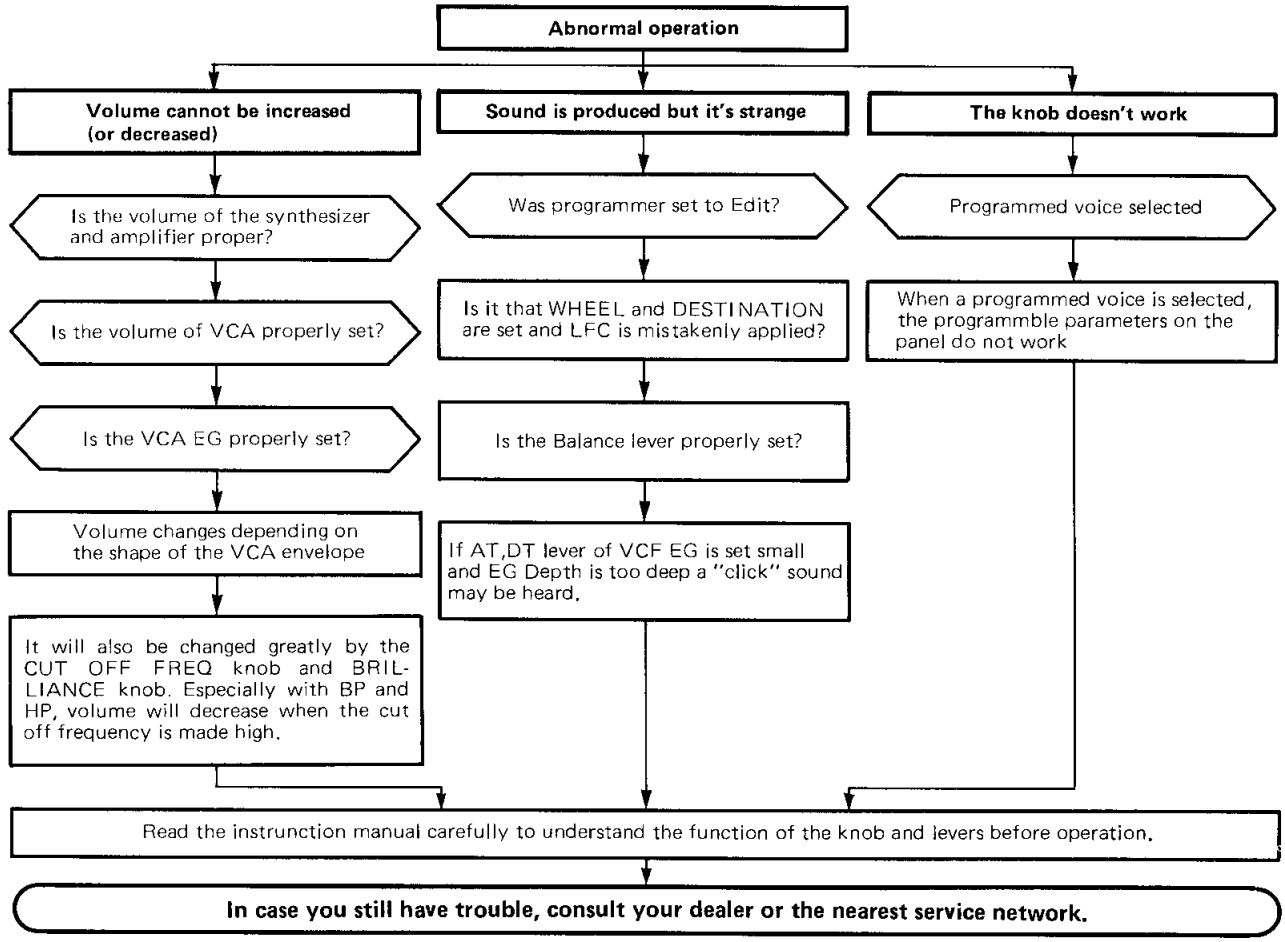


Summary of Operations

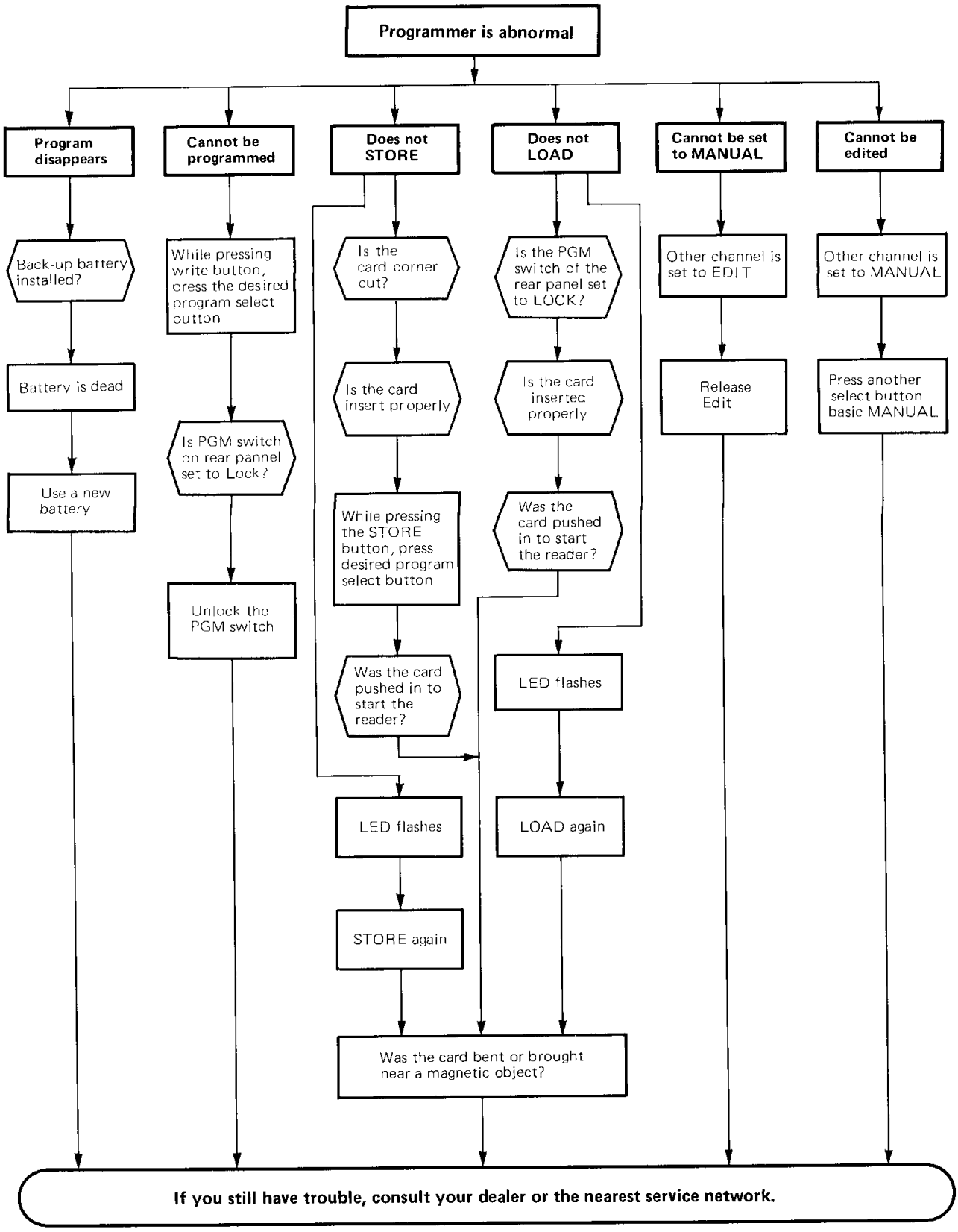


Trouble Shooting

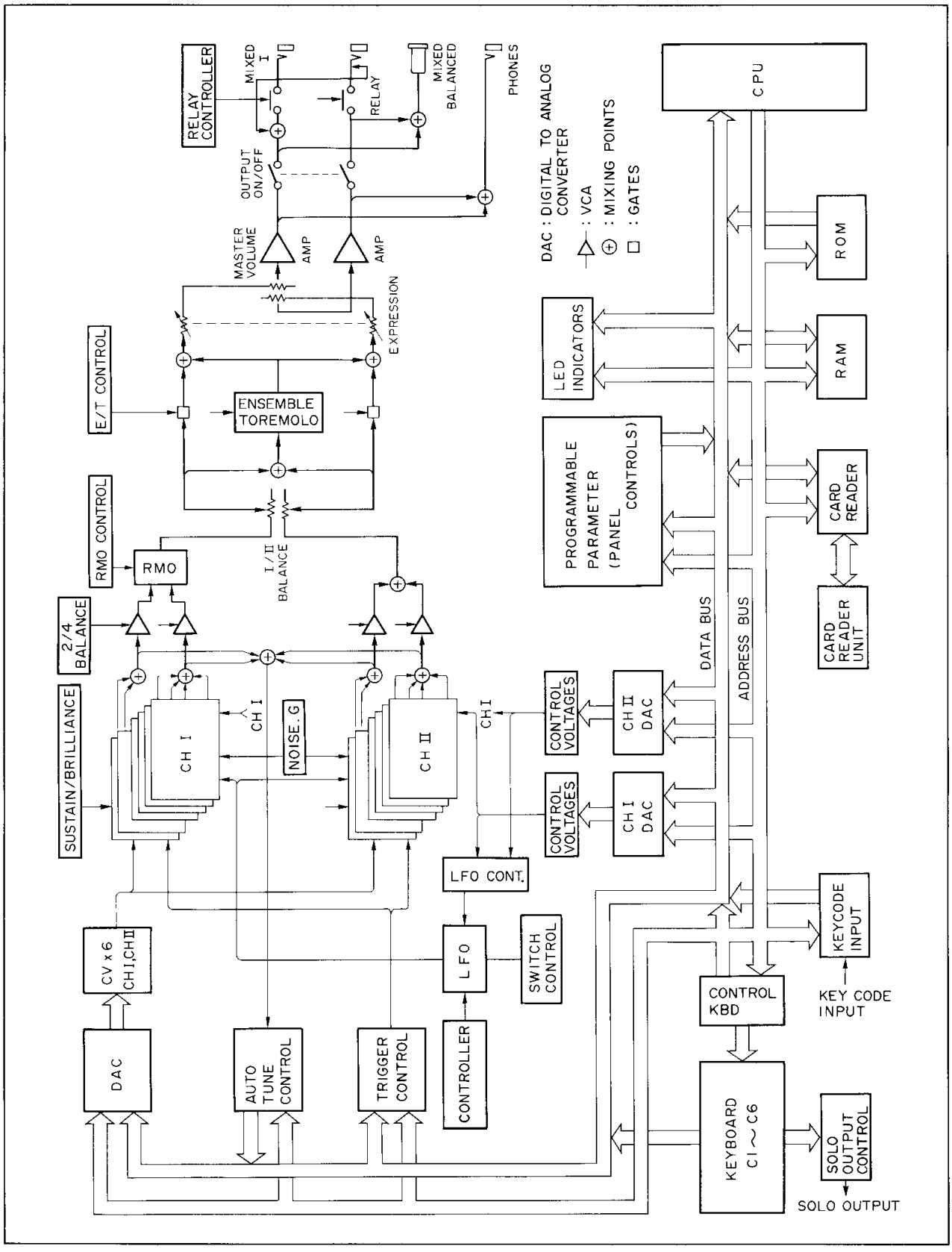




Trouble Shooting



Block Diagram



Specifications

Keyboard . . . . . 61 keys, 5 octaves, C1 – C6

OUTPUT Block
- OUTPUT switch . . . ON/OFF (affect to MIXED/1, 2 and BALANCED output
- VOULUME . . . . . Master volume control

PITCH Block
- TUNE . . . . . Variable range : –100 – +100 cents
- DETUNE . . . . . Channel II only, same as TUNE

CHORUS Block
- ENSEMBLE . . . . . Ensemble ON/OFF switch
- TREMOLO . . . . . Tremolo ON/OFF switch
- SPEED . . . . . Tremolo speed control ; ON ; 6.4 Hz, OFF ; 0.64 Hz

MODE Block
- NORMAL/SPLIT/ UNISON . . Mode switch
  - NORMAL 6 notes later priority basis
  - SPLIT 2+4 or 4+2 notes split by later priority, split position can be changed within all range of keyborad
  - UNISON 6 multiple sound by single note play
- 2/4, 4/2 . . . . . Split note assignation

LFO Block
- ∿ /⋀/⊓ . . . . . LFO waveforms select
- SPEED . . . . . Variable range : 0.05 – 50 Hz
- DESTINATION . . . Switching destination
  - WHEEL/FOOT CONT . . .VCO, VCF and VCA
  - AFTER TOUCH . . . . . VCO, VCF and VCA
- SENSITIVITY . . . . Sensitivity control of touch effect

POLY-PHONIC SEQUENCER Block
- TEMPO . . . . . Center : playback as same speed as record
  Variable range : 0.6 – 1 – 2 times
- X 2 . . . . . Twice in speed
- REPEAT . . . . . Repeat play enable
- CV ONLY . . . . . Record only notes, playback tempo determined by the TEMPO and X2
- A, B, C and D . . . . . Memory bank select, 608 total notes capable in single play
- RECORD . . . . . Record start/stop switch
- PLAY . . . . . Playback start switch

PROGRAMMABLE PARAMETERS Block

VCO
- FEET-1, 2 . . . . . 2', 2'-2/3, 4', 5'-1/3, 8' and 16'
- ⋀/⊓ . . . . . Waveforms select
- PW . . . . . Pulse width control, 50 – 90%
- NOISE . . . . . White noise

VCF
- HP, BP . . . . . Filter select switch, LP is selected if both swith are off
  LP and HP : –12dB/oct.
  BP : –6dB/oct.
- TIME x 5 . . . . . Time extension switch
- ⋁ . . . . . Envelope polarity switch
- CUT OFF FREQ . Cutoff frequency : 10 oct.
- RESONANCE . . Resonance Q : 0.5 – 10
- EG DEPTH . . . . 0 – 10 (10 oct. max.)
- ATTACK TIME . 1 msec – 1 sec
- DECAY TIME . . 10 msec – 10 sec
- SUSTAIN LEVEL . 0 – 10
- RELEASE TIME . 10 msec – 10 sec

VCA
- TIME x 5 . . . . . Envelope time extension
- HOLD . . . . . Any up to 6 notes can be hold
- ATTACK TIME . 1 msec – 1 sec
- DECAY TIME . . 10 msec – 10 sec
- SUSTAIN LEVEL . 0 – 10
- RELEASE TIME . 10 msec – 10 sec
- VOLUME . . . . . 0 – 10

LFO
- SPEED . . . . . 0.1 – 100 Hz
- FINE . . . . . Speed fine adjustment
- EG DEPTH . . . . LFO speed modulation control
- ATTACK TIME . 5 msec – 5 sec
- DECAY TIME . . 50 msec – 50 sec
- MODULATION DEPTH . . . 0 – 10
- ∿, ⋀, S/H, GLIDE+, GLIDE–, RMO LFO waveforms and RMO select
- DESTINATION . VCO, VCF, PW, VCA/I + II
- WHEEL . . . . . Wheel control enable switch

EFFECTS Block
- PORTAMENT/GLISSANDO . . Portamento/Glissando select switch
- TIME . . . . . Speed control
- SUSTAIN . . . . . 10 msec – 10 sec
- BRILLIANCE . . . . –3oct. – +3oct.
- BALANCE
  - 2 – 4 . . . . . Split mode volume balance
  - I – II . . . . . Channel volume balance

PROGRAMMER Block
- 1 – 15 . . . . . Program select switch
- MANUAL . . . . . Manual control
  Edit : able to edit by pressing program select switch twice (indicator flushing status)
  Write: write program data into RAM
- AUTO TUNE . . . . . Automatic tuning system is provided
- CARD Interface
  - STORE . . . . . Write program data onto magnetic card from CS70M
  - LOAD . . . . . Read program data into CS70M from magnetic card

PITCH BEND WHEEL
- OCT/FIFTH/THIRD . Switching variable range
- WHEEL . . . . . Pitch modulation control wheel

REAR PANEL
- OUTPUT MIXED/1, 2
  BALANCED (Mixed)
- FOOT CONT. . . . . Foot controller terminal
  VOLUME : 40dB or more
  BRILLIANCE
  MODULATION
- FOOT SW . . . . . Foot switch terminal
  SUSTAIN : ON/OFF
  PORTAMENT : ON/OFF
  SEQUENCER PLAY : Start/Stop
- SOLO OUTPUT . . . Output solo-synthesizer equivalent signal
  CONTROL VOLT : V/Hz
  TRIGGER : Negative trigger
  Off ; +5V/On ; –5V
- KEY CODE INPUT . External keyboard (SK30 or SK50D) performance input
- PGM . . . . . Memory protection switch
  LOCK : Disable to write
  UNLOCK : Enable to write

POWER CONSUMPTION . . 110 wattes
DIMENSION . . . . . 1,120 x 180 x 500 mm
44 x 7 x 19-¾ in (W x H x D)
WEIGHT . . . . . 28.8 kg, 63.4 lbs
FINISH . . . . . Rose wood grained

Recommended amplifier. . . .Keyboard amplifier or equivalent
Optional equipment . . . . . Magnetic card set with holder BLC-40
Foot switch FC-4
Foot controller FC-3A

*** Specifications subject to change without notice due to improvement.**

SINCE 1887

YAMAHA

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