GR-700

SERVICE NOTES

First Edition

SPECIFICATIONS

MEMORY
- Internal : 64 Patch Programs (16kbyte RAM, battery backed-up)
- External : 32 Patch Programs (2kbyte Memory Cartridge)

EDITABLE PARAMETERS : 32

DISPLAY : 1" 4 Fig. 7 Seg LEDD

OUTPUTS
- XLR : 0dB/600 Ohm
- Standard Jack : 0dBm/ 5kOhm; −15dB, or −30dB
- Guitar : −20dB/ 1kOhm

TUNE RANGE : ± 50 cents

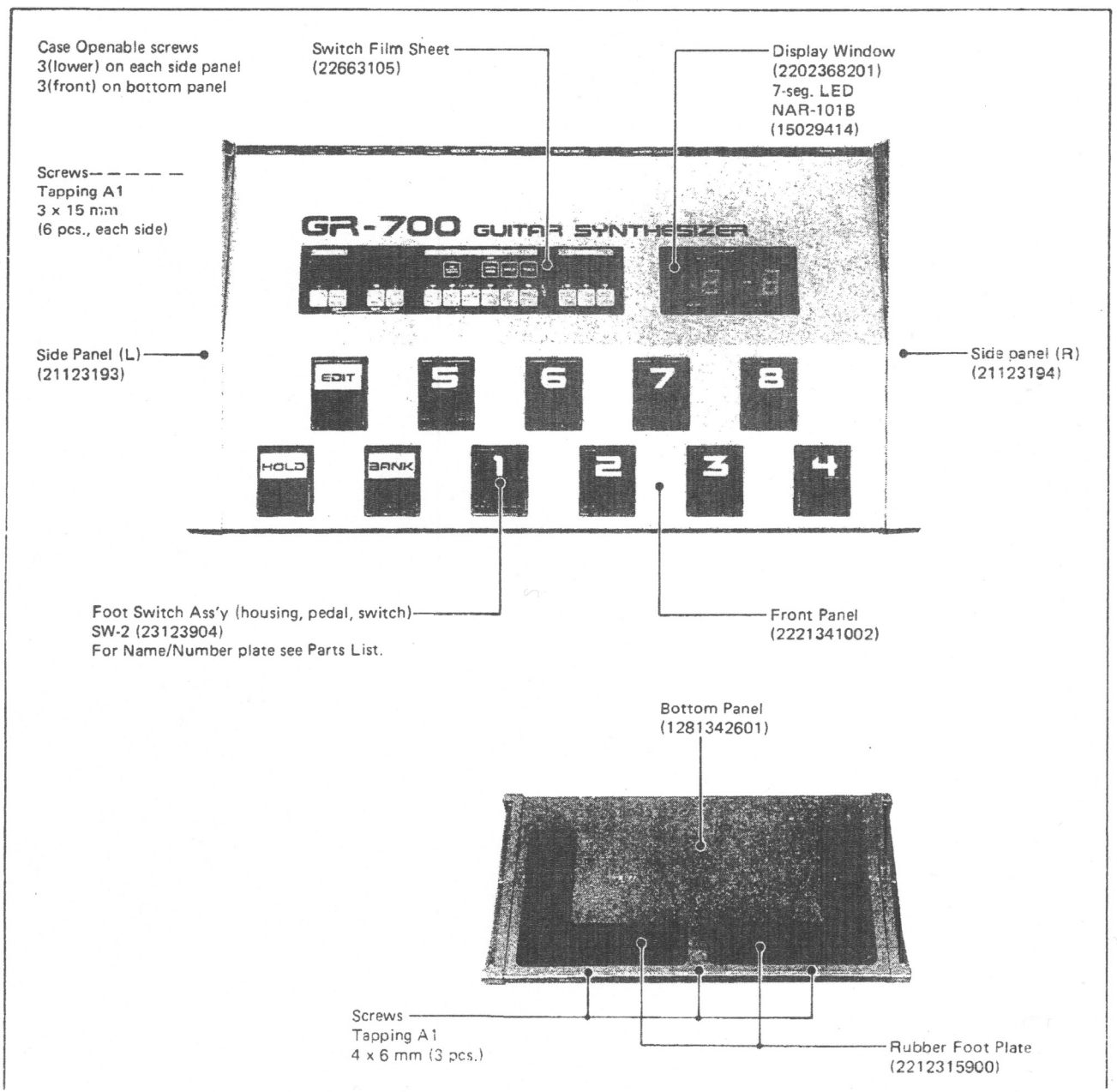
POWER CONSUMPTION : 45W

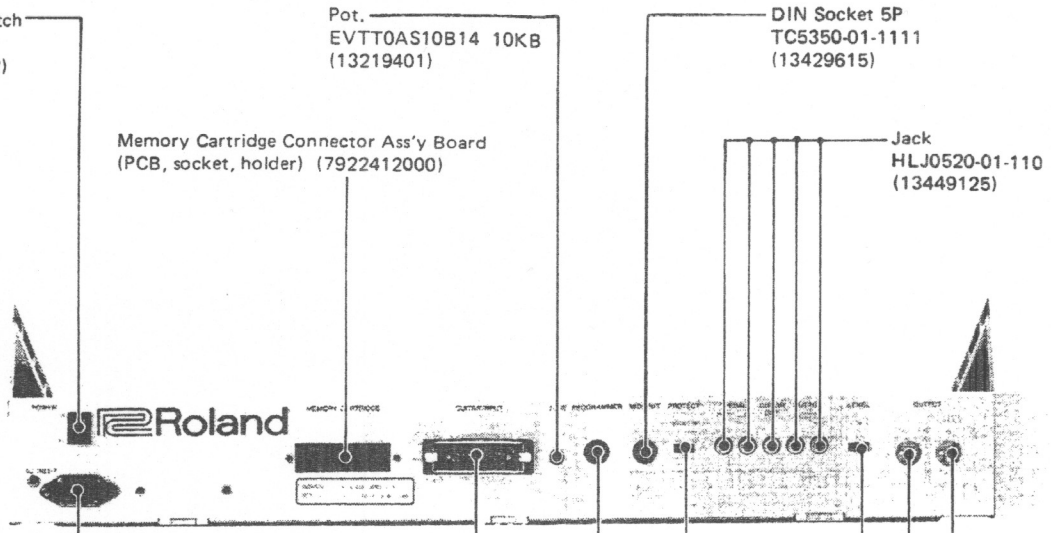
DIMENSIONS : 690(W) x 375(D) x 155(H) mm
27-3/16(W) x 14-3/4(D) x 6-1/8(H) in

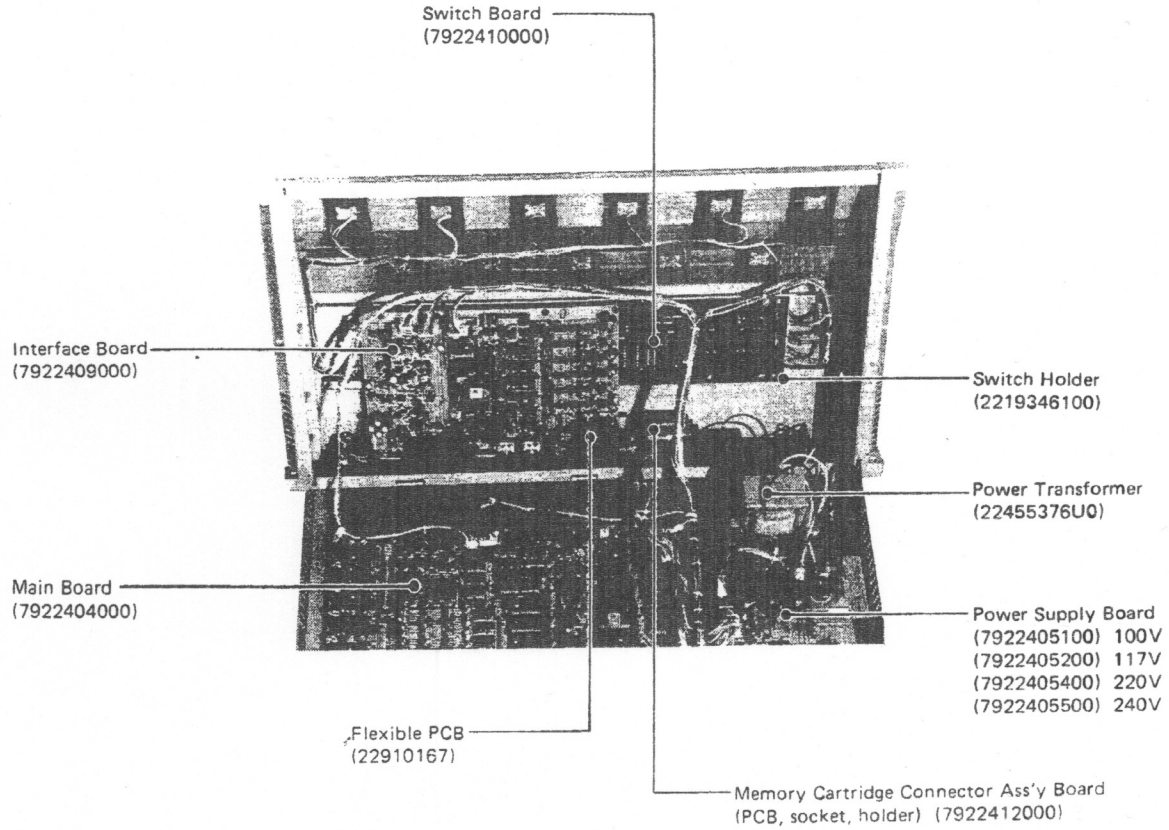
WEIGHT : 12 kg/26 lb. 70 oz.

ACCESSORIES
- Connection Cable (LP-25) : 2
- Connection Cable (C-24D) : 1
- (6P DIN/1.5 m) : 1
- AC Cord : 1
- Memory Cartridge (M-16C) : 1 2kbyte

OPTIONS : Programmer PG-200
Foot Volume FV-200
Carrying Case




Power Switch
1801-0121
(13419102)
Pot.
EVTT0AS10B14 10KB
(13219401)
DIN Socket 5P
TC5350-01-1111
(13429615)
Memory Cartridge Connector Ass'y Board
(PCB, socket, holder) (7922412000)
Jack
HLJ0520-01-110
(13449125)
Roland
AC Inlet
PA-126
(13429710) 100/117/220V
CM-3
(13429708) 240V
24P Connector
SLC1204-2324F
(13429405)
Lock Shell
SLC1204-24L1
(12139302)
DIN Socket 6P
TCS5360-01-1111
(13429621)
XLR Connector
HA-16R-3P
(13439851)
Slide Switch
HSW0372-01-530
(13159316)


Switch Board
(7922410000)
Interface Board
(7922409000)
Switch Holder
(2219346100)
Power Transformer
(22455376U0)
Main Board
(7922404000)
Power Supply Board
(7922405100) 100V
(7922405200) 117V
(7922405400) 220V
(7922405500) 240V
Flexible PCB
(22910167)
Memory Cartridge Connector Ass'y Board
(PCB, socket, holder) (7922412000)

PARTS LIST

CHASSIS, PANEL, HOLDER

2221341002	Front panel	
2281342601	Bottom panel	
21123193	Side panel (L)	
21123194	Side panel (R)	
2212315900	Rubber foot plate	
2219346100	Push switch holder	
22663105	Push switch film sheet	
2202368201	Display window	

SWITCH

23123904	Foot switch SW-2 (houshing, pedal, switch)	
22123148	Pedal plate 1	
22123149	Pedal plate 2	
22123150	Pedal plate 3	
22123151	Pedal plate 4	
22123152	Pedal plate 5	
22123153	Pedal plate 6	
22123154	Pedal plate 7	
22123155	Pedal plate 8	
22123156	Pedal plate HOLD	
22223157	Pedal plate EDIT	
22123158	Pedal plate BANK	
13159316	HSW0372-01-530	slide
13129715	KHC10901	light touch
22473718	Button	

POTENTIOMETER

13219401	EVTT0AS10B14	TUNE 10kB
13299189	H0615C119-4.7kB	trimmer
13299177	H0615C119-10kB	trimmer
13299190	H0615C119-47kB	trimmer

SOCKET, CONNECTOR

13449125	HLJ0520-01-110	All jacks
13429615	TCS5350-01-1111	DIN MIDI output
13429621	TCS5360-01-1111	DIN PG-200 input
13429122	FHI12S-2.54DSA	Flexible PCB connector
13429405	SLC1204-2324F	Guitar input
12139302	SLC1204-24L1	Lock shell
22910167	Flexible PCB	
13439851	HA-16R-3P	XLR receptacle

AC CORD, INLET

13429710	PA-126	Inlet	100/117/220V
13429708	CM-3	Inlet	240V
13439825	DC-320-J01	Cord	100V
13439812F0	UC-704-J01	Cord	117V
13439813F0	EC-210-J06	Cord	220V
13439817F0	EC-702-J05	Cord	240V 3P England
13439814F0	SC-415-J06	Cord	240V 3P Australia

TRANSFORMER, COIL, RESONATOR

22455376U0	Power transformer	100/117/220/240V
12449221	40M-067-018	10μH OSC
12449229	FKOB-160MH15	Line filter
12389719	KMFC1007T31	Main 12MHz
12389720	CSA12.00MHz	Interface 12MHz
13529105	DSS310-55D223S	EMI filter

FUSE

12559336	GGS 2.0A	100/117V
12559513	CEE T1A	220/240V

PCB ASS'Y

7922404000	Main board (synthesizer) (pcb 2291391601)	
7922409000	Interface board (pcb 2291391502)	
7922405100	Power supply board (pcb 2291391201)	100V
7922405200	Power supply board (pcb 2291391201)	117V
7922405400	Power supply board (pcb 2291391201)	220V
7922405500	Power supply board (pcb 2291391201)	240V
7922410000	Switch board (pcb 2291391301)	
7922412000	Memory cartridge connector board (pcb 2291391400) (Ass'y including socket, mounting PCB, holder)	

DIGITAL IC

15179142	i8051	CPU
15179654	2764/SH	Program
15179655	2764/IF	Program
15179317	TC5517APL	CMOS RAM
15179110B0	M5L8253P-5	Timer/Counter
15229818	HD61J222P	IF gate array
15219130	ADC0803	AD converter
15169304H0	HD74LS04P	Hex inverter
15169307H0	HD74LS27P	Tri NOR
15169339H0	HD74LS32P	Quad OR
15169360X0	SN74LS92P	Counter
15169318H0	HD74LS138P	Decoder
15169321H0	HD74LS161P	Counter
15169322H0	HD74LS174P	Hex D-FF
15169327H0	HD74LS367P	Hex buffer
15159503	TC40H000P	CMOS inverter
15159524	TC40H245P	CMOS driver
15159511	TC40H174P	CMOS D-FF
15159508	TC40H373P	CMOS latch
15159104S0	LC4011BP	Quad NAND
15159134H0	HD14028BP	Decoder
15159112H0	HD14049BP	Hex inverter
15159128H0	HD14050BP	Hex buffer
15159113H0	HD14051BP	Analog switch
15159129H0	HD14053BP	Analog switch
15149115	M54523P	LED driver
15159702	M54563P	LED driver

ANALOG IC

151891290A	TL-072CP	selected in offset
15189129	TL-072CP	OP amp
15189105	μPC4558	OP amp
15189136	M5218L	OP amp
15229802	BA662A	VCA
15229817	A1QH800170	VCF/VCA pack
15199123	M5231L	V-regulator
15199117	M5230L	V-regulator

TRANSISTOR

15119133	DTA114F	Digital TR	
15129150	DTC114F	Digital TR	
15119106D0	2SA933	PNP	
15119108	2SA798	PNP pair	(INTF. BRD)
15119601	2SB605	PNP drive	(PS. BRD)
15119814	2SB834	PNP power	(PS. BRD)
15129107	2SC945Q	NPN	
151291070G	2SC945Q red	Selected and grouped in	
151291070H	orange	terms of Gm. All TR3's	
151291070I	yellow	and TR4's on a given Main	
151291070J	green	Board must be of a color.	
15129107NZ		Selected for NOISE	
151291300G	2SC1583	NPN pair	(PS. BRD)
15129201	2SD880	NPN power	(PS. BRD)
15139103	2SK30A-GR	FET	
or 15139101	2SK30A-Y		

DIODE, ZENER, LED, PHOTOCOUPLER

15019103	1S2473	Small switching
15019236	W-02	Stack rectifier 2A
15019257	4D4B41	Stack rectifier 4A
15019208	1SR35-200	Rectifier
150196120Z	05Z-5.1Z	Zener 5.1V
15029177	GL5HD-5	Dot LED
15029414	NAR-101B	7 segment LED
15229703	P-873	Photocoupler

RESISTOR

13919310	RM-8 103J	10K x 8 array
13919321	RML13 103J	10K x 13 array
13919146	RKM14L503F	R-2R D/A array
13769155K0	SN14K2EF 1.8K	Metal oxide
13769161K0	SN14K2EF 3.3K	Metal oxide
13769165K0	SN14K2EF 4.7K	Metal oxide
13769169K0	SN14K2EF 6.8K	Metal oxide
13769162K0	SN14K2EF 3.6K	Metal oxide
13769173K0	SN14K2EF 10K	Metal oxide
13769181K0	SN14K2EF 22K	Metal oxide
13769182K0	SN14K2EF 24K	Metal oxide
13769183K0	SN14K2EF 27K	Metal oxide
13839191F0	M04S5WK5.1	5W 5.1ohm cemented
15229909	ERSB33G561	560ohm posistor

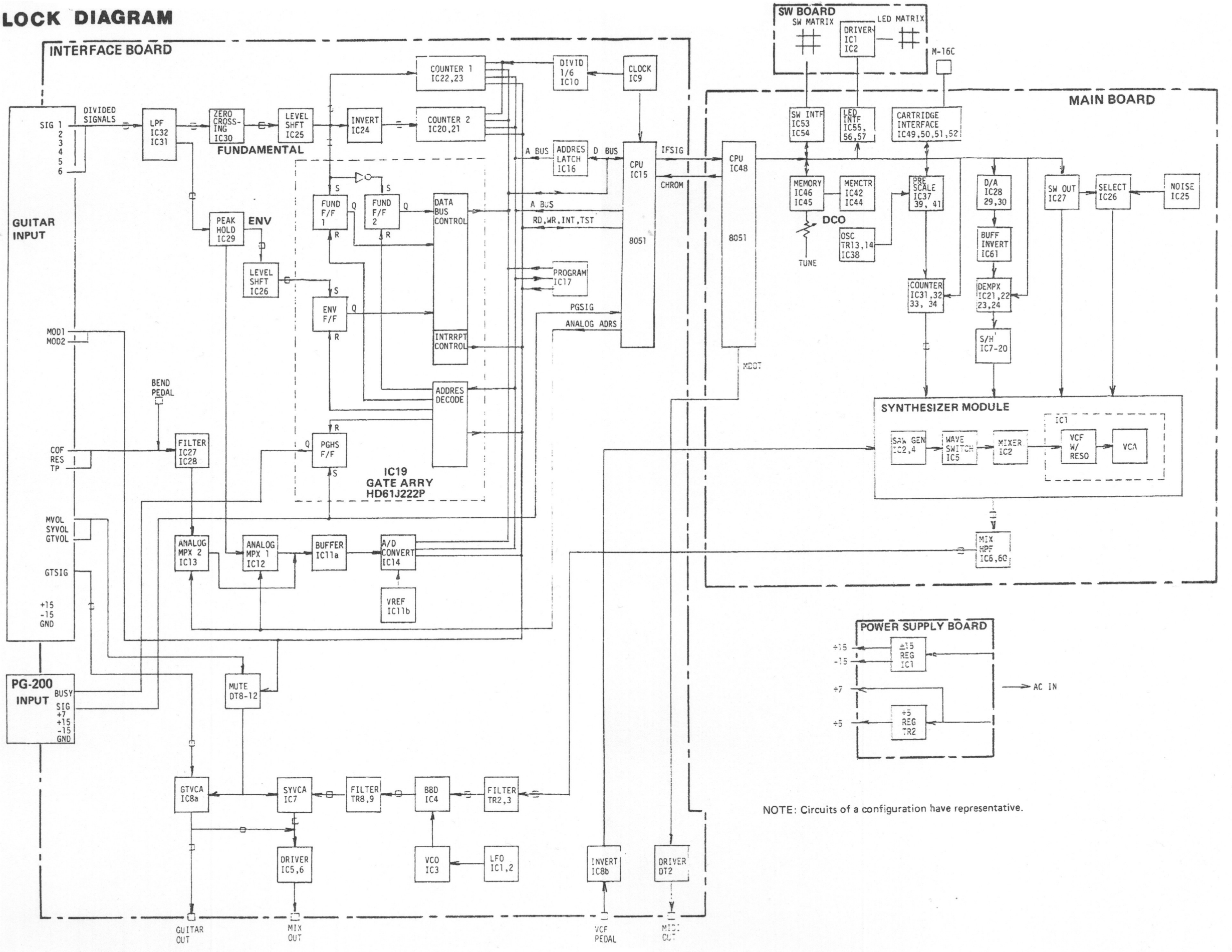
CAPACITOR

13569167	CQ09S1H100RJ05	Polystyrene
13529104	DE7150F472VMA1	Line bypass
13529106	HM11SJYE472P	OSC 470P

OTHERS

22373602	Memory cartridge M-16C (GR-700 sample sounds)
7922415000	Connector cable C-24D

BLOCK DIAGRAM



NOTE: Circuits of a configuration have representative.

CIRCUIT DESCRIPTIONS

When the GR-700 is connected to a guitar controller, for example, G-707 that is especially designed to use with the GR-700, it can accept the following signals:

1. Independent 6 notes from the Divided Pickup
2. CUTOFF controll voltage (COFCV)
3. RESONANCE amount control voltage (RESCV)
4. VIBRATO depth (TPCV)
5. Selection between standard guitar and synthesizer sounds, and sensitivity of synthesizer module.
6. VOLUME controls (M. VOL, SY VOL, GT VOL)
7. Standard electric GUITAR pickup (GT SIG)

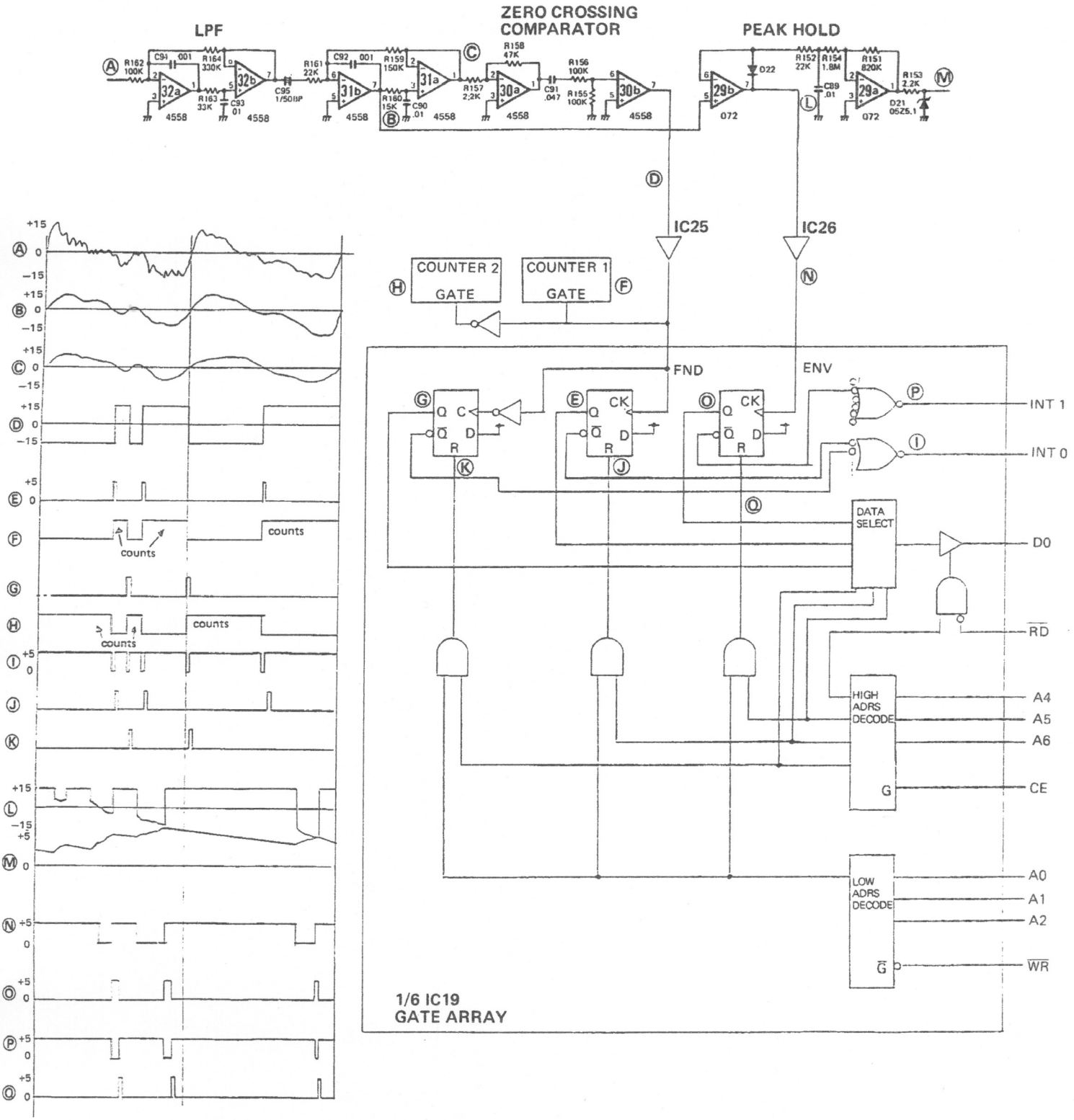
These control signals from the Guitar Controller are first routed to the Interface Board of the GR-700 through 24-pin connector.
Except for volume control signals and the standard guitar sounds, these signals are degitalized and sent to the Main Board in a serial format via IFSIG line connecting Interface CPU IC15 and Main Board CPU IC48 which controls synthesizer modules and memory section.

INTERFACE BOARD

Output from the Divided Pickup signals are fed to LPFs ICs 31 and 32 which block unwanted high frequency components and pass the signals onto Zero Crossing Comparator IC30. The periods between edges are determined through counters 1 (ICs 22 and 23) and 2 (ICs 20 and 21); Counter 1 measures the high periods and 2 low. Two Flip-flops in the Gate Array IC19 detect the positive going and the negative going edges respectively and send the result to the CPU IC15.
The CPU reads Counter 1 (high period) on a negative going edge and Counter 2 on a positive.
It seems easier to determine a period of one fundamental when the high and the low periods are summed. However, the attack period of a guitar sound is rather unstable in frequency. The number of edges in one fundamental cycle varies from time to time; the high and low counts have to be summed through several fundamental cycles before the sound pitch is determined. The measurement involves complicated program.
Before placing note data on the CPU data bus, the software checks the mode: Normal or Chromatic. In normal mode a note data (CV DATA) actually represents the pitch as it is on the guitar. In CHROMATIC mode all notes are converted to the nearest predetermined pitch even if the guitar is slightly out of tune.
Since the chromatic system is liable to bring a confusion in relation to guitar and synthesizer tuning, it is detailed in the later sections:
CHROMATIC SCALING and TUNING.

ENVELOPE

The output at IC31 LPF is also applied to Peak Hold IC29 where the changes in peak are detected and fed through the Level Shifter IC26 to ENV F.F. in the Gate Array IC19, triggering the F.F. which in turn informs the CPU IC15 of the level changes of the output of the string being played. Then the CPU reads the peak value through Analog Multiplexer IC12, Buffer IC11a and through Analog to Digital Converter IC14.
As mentioned earlier, the CPU does not deal with volume controls and standard pickup output sounds directly.


LPF
ZERO CROSSING COMPARATOR
PEAK HOLD
IC25
IC26
COUNTER 2 GATE
COUNTER 1 GATE
FND
ENV
DATA SELECT
HIGH ADRS DECODE
LOW ADRS DECODE
INT 1
INT 0
D0
RD
A4
A5
A6
CE
A0
A1
A2
WR
1/6 IC19 GATE ARRAY
counts

MAIN BOARD

DCO

Master Oscillator

TR14 (13) generates a frequency of approx. 5.7MHz which is variable by changing the base emitter bias from TUNE (DCO 1 and DCO 2) and FINE TUNE (DCO 2, TR13 only).
The Master Oscillator is divided by either 1/2, 1/4 or 1/8 at IC39 (IC37) which in turn receives footage selection data (RANGE) from the CPU through IC41. This will enable the Programmable Counters to have the greater frequency resolution capabilities (16 bits plus 2 bits).

Programmable counters

Programmable Counter 8253 containing three 16-bit counters is capable of dividing high frequency signals. Assume that the master oscillator runs at 5MHz and divisor is 5000, the counter develops 1kHz rectangular signals.
Beside note information, divisor signal contains the following:

For DCO 1 - - LFO, ENV
For DCO 2 - - Above plus DCO TUNE.
In SYNC mode, pulses from DCO 1 are applied to the gate of mated counter of DCO 2 as reset pulses.

D/A & S/H

Parameters that determine the timbre of audio signal flowing into Synthesizer module are converted into analog equivalent (0 to 4.7V) at D/A converter consisting of IC28, 29, 30, R-2R ladder resistor RM1 and IC61. Buffers (IC29) on MSB 2 bit lines significantly reduce the effects of output impedances of ICs 28 and 30.
The D/Aed parameters are then applied commonly to Demultiplexers ICs 21 to 24 and are sampled and held into correct channel in individual stages.

SWITCH OUTPUT AND SELECTION

ON or OFF and selection between circuit functions in the Modules and successive stages are performed by electronic switches named as DCO WAVEFORM, SYNC, SYNMET and NOISE. Switch Control signals from Latch IC27 are fed to switch gears either directly or through IC26.
NOISE ON signal is also routed to pin 1 of IC37 to block DCO 2 master frequency.

WAVEFORM CONVERSION

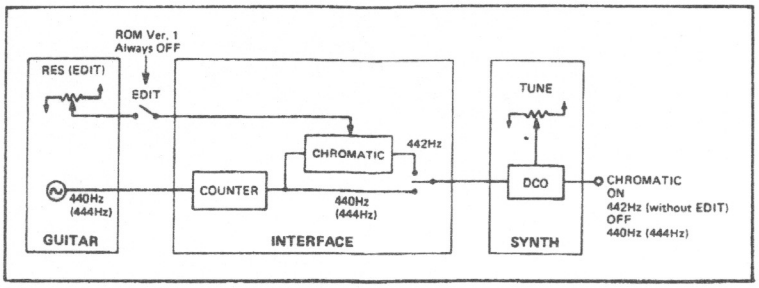
Output from Programmable Counter 8253 is a rectangular. So there is a need to convert it to sawtooth when selected. The conversion is carried out on the constant-current integrating-circuit (C8) making use of IC4. The rate of current flowing into C8 is determined by the output from the S/H circuit of DCO CV. Pulse at TR6 base (differentiated IC31 output) discharges C8 at the rectangular rate.
As already mentioned, DCO CV contains amounts of ENV, LFO, RANGE, etc. whatever relating to note pitch, and keeps the sawtooth amplitude constant over the frequency range.
The CPU will add a bias to DCO CV to excessively increase charging current when the program needs a pulse-like sawtooth.
When rectangular is selected, it is allowed to pass NAND gate IC5, while TR6 is kept conducting by forward bias from pins 1 and 15 of IC26, bypassing C8 charging current.
NOTE: With sawtooth selected pin 4 of IC5 stays high (+5V).

SYNC

With positive voltages fed at pins 2 and 12 IC5 develops and applies reset pulses to DCO 2 Programmable Counter and to TR5 base at a DCO 1 rate.

CHROMATIC SCALING

To give the GR-guitar synthesizer a definite pitch of keyboard-like equal temperament, a chromatic system is furnished in the GR-700. The system inevitably functions like an AFC or automatic fine tunings when in Chromatic mode: when input guitar signal is slightly out of tune with respect to the system's reference pitch, the system adds or substructs compensation CV data. For example, the chromatic system converts input frequencies ranging 430–455Hz to a note A of 442Hz. Therefore, there are three main factors that determine the whole system tuning: Guitar, Synthesizer (DCO) and Chromatic system.



REFERENCE PITCH CHANGE

In early products the software (Ver. 1) does not allow the chromatic system to shift the reference pitch (A = 442Hz) to another frequency. Ver. 2 removes this restriction. See "SOFTWARE REVISION" in the later section.
Whether the chromatic pitch is shiftable or not, the functions of Chromatic and TUNE on the GR-700 rear panel must clearly be understood for achieving complete system tuning.

TUNING

CAUTION

For tuning, select a tone which is reproduced by DCO-1 or DCO-2 (synced to DCO-1). Also the voice should be unmodulated one.

Unit with fixed standard pitch A=442Hz ---SNs below 410450 or ROM ver. 1.

1. Adjust BALANCE on the guitar for proper guitar and synthesizer sound loudness.
2. Adjust TUNE on the GR-700 rear panel for zero beat. The tune of the guitar has no relation to this adjustment. The heat of this adjustment is to let the DCO-1 faithfully track the CVs from the guitar controller.
3. Enter Edit mode and select parameter 48. The synthesizer will produce absolute pitch of open string for each string picked based on A above middle C = 442Hz. Tune each string to the synthesizer pitch.
4. Confirm that the synthesizer pitch does not change between Chromatic ON and OFF modes.

CAUTION

If the guitar is not tuned the way in step 3 above, there will be pitch differences between guitar and chromatic synthesizer sounds. Also, do not adjust synthesizer TUNE during chromatic mode. If doing so, sythesizer will generate at different pitch in chromatic OFF mode.

Unit with adjustable standard pitch ---SNs 410450-up or ROM ver. 2.

1 and 2. Follow steps 1 and 2 described above.
3. Tune the guitar to a reference pitch (instruments or tuner, etc.).
4. Enter the edit mode and select parameter 48. Adjust EDIT (RES) on the guitar for zero beat (guitar and synthesizer).
5. Escape edit mode. While switching between chromatic on and off, verify that there is no pitch difference.

In the subsequent performance, the guitar can be tuned to the GR-700's standard pitch, which will be generated whenever parameter 48 is selected, on the condition that the parameter 48 has not been re-edited after adjustment.

MEMORY -- PROGRAM TRANSFER FROM ROM TO RAM --

ROM IC46 of the Main Board contains Adjustment program and some factory presets of BANK 1 to BANK 4. These programs can be transferred into RAM IC45 as required. It should be noted that the existing BANKs 1–4 memories will be replaced at the same time and should be saved into the memory cartridge before transferring the ROM program. Also remember that the memory protection must be set to OFF and ON as necessary.

FACTORY PRESETS

Turning ON the power switch while pressing WRITE (COPY) button will restore BANKs 1–4 by writing the data from the ROM. No data are prepared for BANKs 5–8.

ADJUSTMENT PROGRAM

Turning the power switch ON while pressing WRITE and STRING SELECT NO. 6 will load the adjustment program into BANK 1. At the same time, factory preset data for BANKs 1–3 are also loaded into BANKs 2–4 (being shifted by one BANK). Of course, these presets are actually not for the adjustment purpose. This rather strange phenomenon is due to the fact that the data loading process in this mode is designed to be done four bank memories as a set.

Upon completion of the adjustments, these banks should be reloaded with the previous data now being stored in the memory cartridge.

SOFTWARE REVISION

In addition to the label on top surface, PROM SH (IC46 of Main Board) has a version identification program which reads its number in the display window (PATCH) when the unit is powered up while STRING SELECT NO.4 is pressed. (Incidentally, the PATCH corresponding to the revision number will be selected at the same time). The number will not change until another pedal is pressed.

PROM IF (IC17 of Interface Board) does not have such identification means except for a mark on the label. To prevent confusion, the factory changes revision number of both PROMs at the same time whenever either of them is updated.

VERSION	PROGRAM CHANGE
SN 410450-UP 2	PROM SH (IC46, MAIN BOARD) does not allow Chromatic circuit to change its equal temperament pitch, e.g. A above middle C = 442Hz. (Ver. 1) Revision 2 enables chromatic pitch to shift within the range 438–446Hz when adjusted from EDIT (RES) on the guitar controller with parameter 48 selected in the EDIT mode.
SN 431550-UP 3	PROM IF (IC17, INTERFACE BOARD) sometimes fails to maintain sustain level if RES (EDIT) is turned to MAX. when SUSTAIN LEVEL is being edited.
SN 442050-UP 4	PROM IF (IC17, INTERFACE BOARD) The frequency range which is covered and defined as note B by the chromatic system is rather narrower when compared with that of other notes. As a result, a note in lower B range would be recognized as A#. Revision 4 correct the problem.

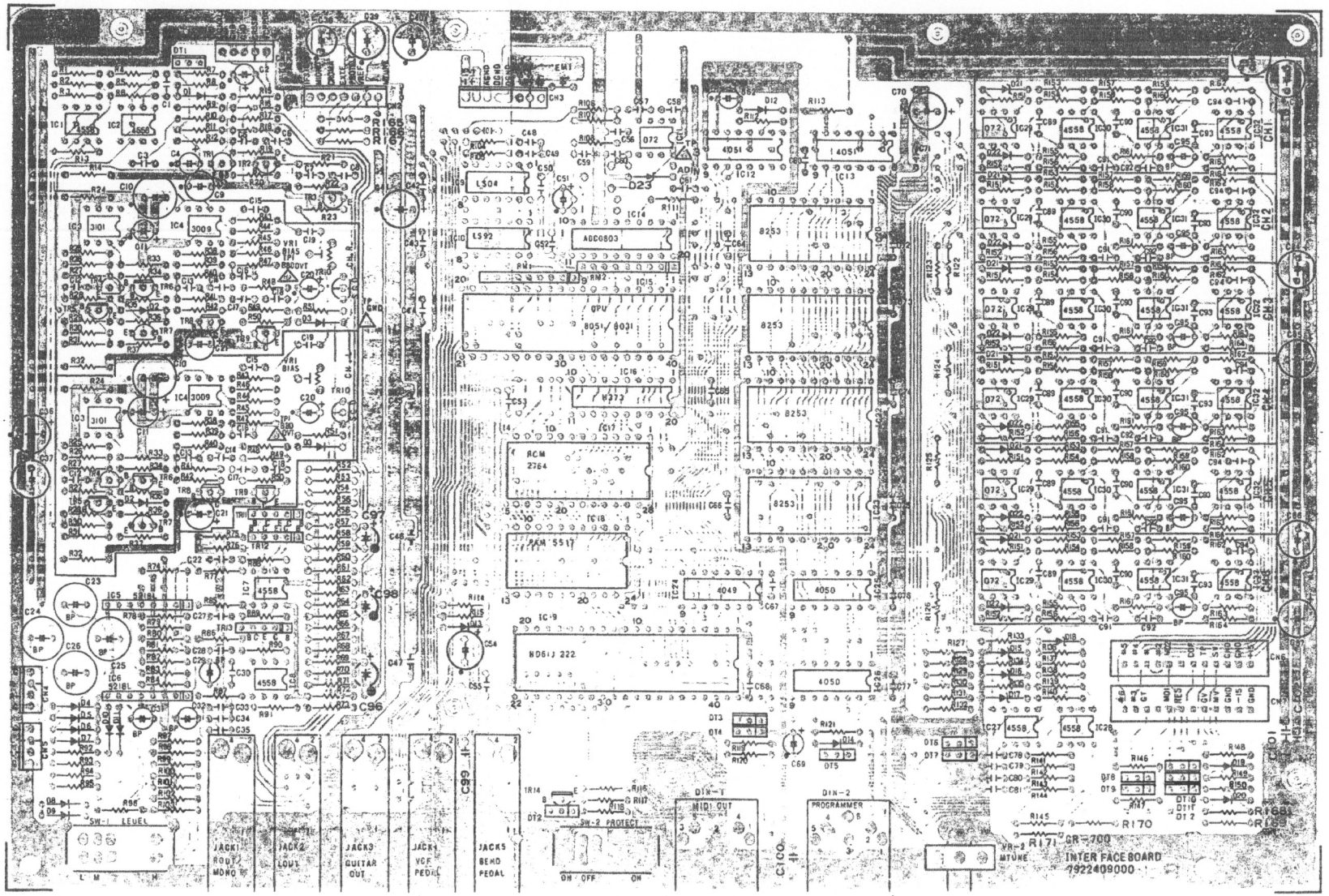
GUITAR CONTROLLER MODE SWITCH VS GR-700 OPERATION MODE

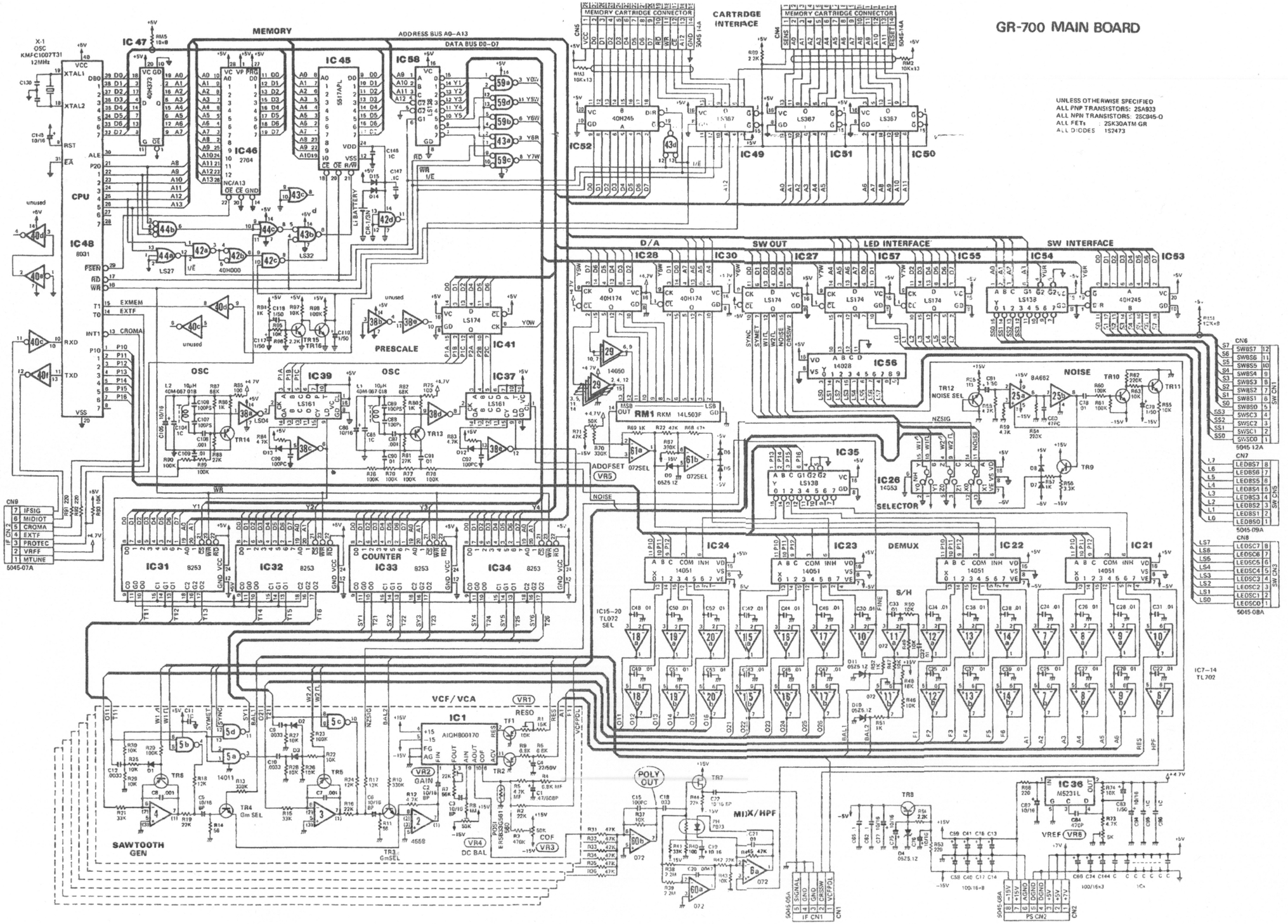
The setting postion of MODE on a guitar controller is sent to the GR-700 through the MODE 1 and 2 signal lines over 24 pin cable. This means that the selection of VCAs and controllability of volume controlls are determined by the 2 bit code represented on MODE lines.

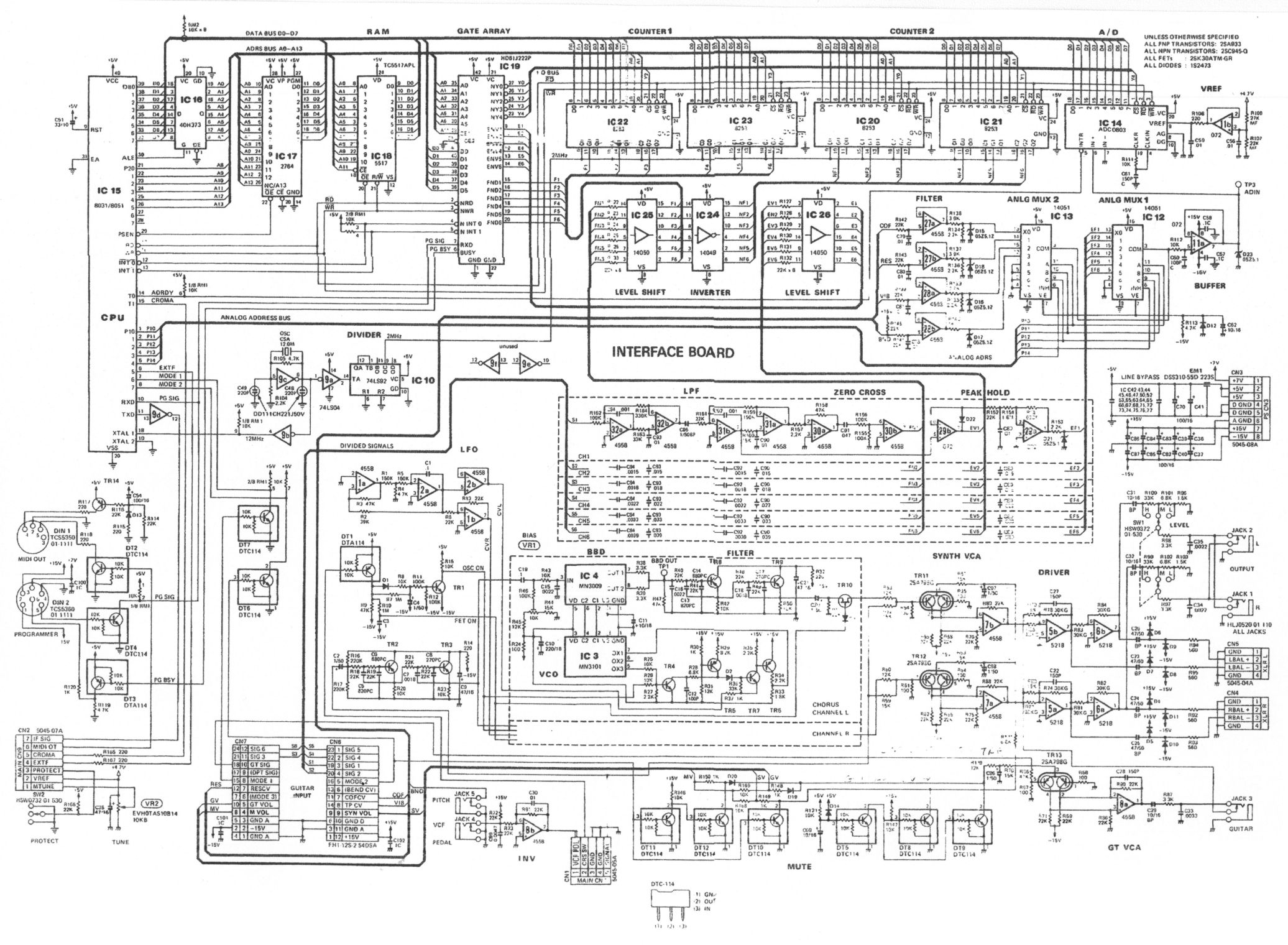
GUITAR CONTROLLER	GR-700																
MODE SWITCH G-707 (G-303, G-808)	MODE 1 (CN 7 PIN 8)	MODE 2 (CN 6 PIN 5)	DT11	DT12	DT10	SYN VOL	SYN SOUND	GT VOL	M VOL	GT SOUND	VCA GT CONTROLLED BY	VCA SYNTH CONTROLLED BY	DT7	DT6	CPU P16	CPU P17	SENSITIVITY TO DIVIDED PICKUP OUTPUT
I (DIST)	L	H	ON	OFF	ON	CUT OFF	OFF	CUT OFF	ENABLE	FOLLOWS M VOL	M VOL only	CUT OFF	OFF	ON	H	L	don't care
II (VCO+DIST)	L	L	OFF	ON	OFF	ENABLE	FOLLOWS SYN VOL	ENABLE	CUT OFF	FOLLOWS GT VOL	M VOL BALANCE		OFF	OFF	H	H	P16=H LOW
III (VCO)	H	L	OFF	ON	OFF	ENABLE	FOLLOWS SYN VOL	ENABLE	CUT OFF	FOLLOWS GT VOL	M VOL BALANCE		ON	OFF	L	H	P16=L HIGH

NOTES: MODE 1 and 2 —— low active, CPU pin 17 —— don't care

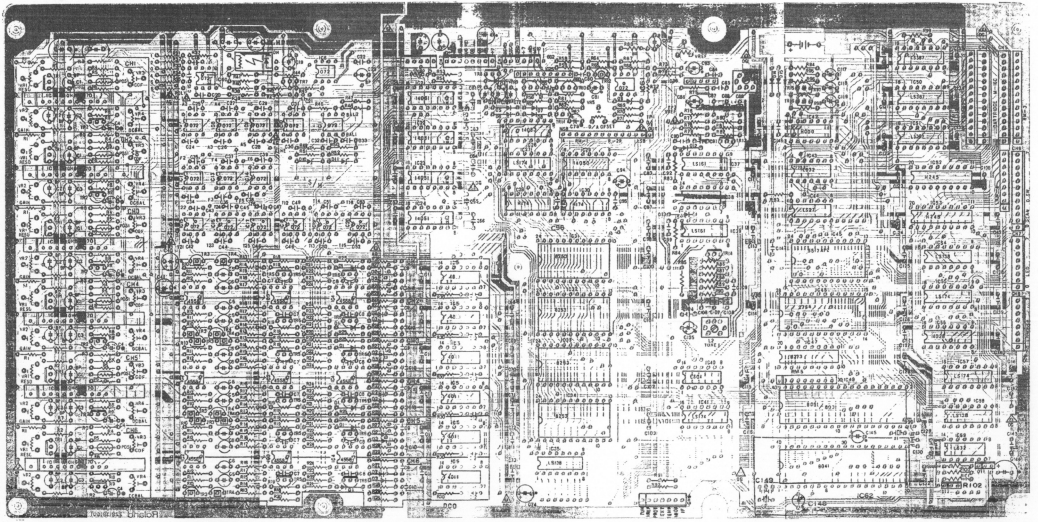
INTERFACE BOARD
7922409000
(pcb 2291391502)




GR-700 MAIN BOARD
CARTRDGE INTERFACE
MEMORY CARTRIDGE CONNECTOR
MEMORY
ADDRESS BUS A0–A13
DATA BUS D0–D7
UNLESS OTHERWISE SPECIFIED
ALL PNP TRANSISTORS: 2SA933
ALL NPN TRANSISTORS: 2SC945-O
ALL FETs : 2SK30ATM GR
ALL DIODES : 1S2473
CPU
IC48
8031
IC47
IC45
IC46
2764
IC58
IC52
IC49
IC51
IC50
D/A
SW OUT
LED INTERFACE
SW INTERFACE
IC28
IC30
IC27
IC57
IC55
IC54
IC53
IC56
14028
IC41
PRESCALE
IC39
IC37
OSC
RM1 RKM 14L503F
IC35
SELECTOR
IC26
14053
NOISE
TR12
NOISE SEL
TR10
TR11
TR9
IC31
IC32
IC33
COUNTER
IC34
8253
IC24
IC23
IC22
IC21
DEMUX
S/H
VCF/VCA
IC1
AIQH800170
VR1
RESO
VR2
GAIN
VR3
COF
VR4
DC BAL
VR5
ADOFSET
VR6
VREF
SAWTOOTH GEN
MIX/HPF
POLY OUT
IC36
M5231L
CN1
IF CN1
CN2
PS CN2
CN6
SW CN1
CN7
SW CN5
CN8
SW CN3
5045-07A
5045-09A
5045-08A
IC7–14
TL702
IC15–20
TL072
SEL

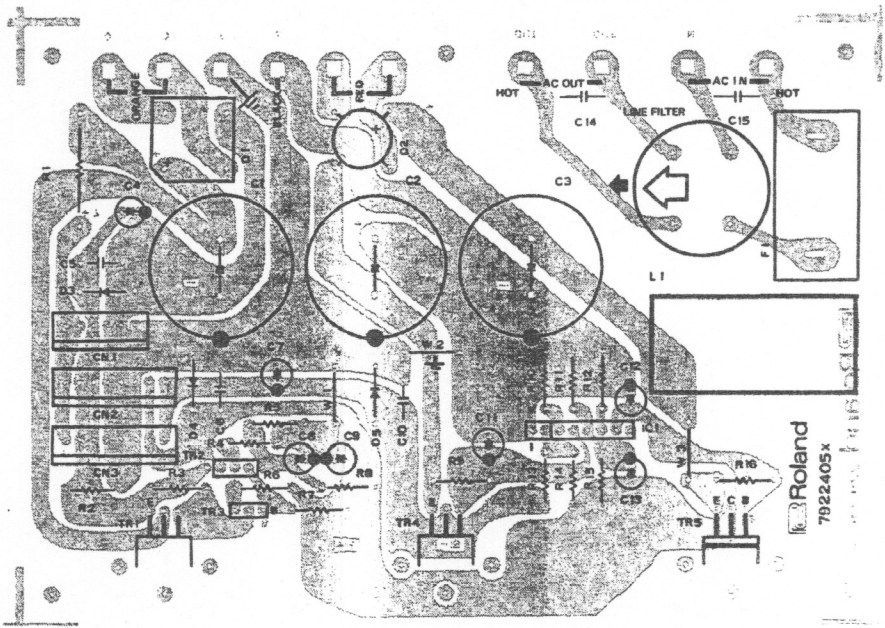

INTERFACE BOARD
CPU
IC 15
8031/8051
IC 16
40H373
IC 17
2764
IC 18
5517
IC 19
HD81J222P
IC 22
8253
IC 23
8253
IC 20
8253
IC 21
8253
IC 14
ADC0803
IC 25
14050
IC 24
14049
IC 26
14050
IC 13
14051
IC 12
14051
IC 10
74LS92
74LS04
DIVIDER
2MHz
12MHz
DATA BUS D0–D7
ADRS BUS A0–A13
RAM
GATE ARRAY
COUNTER 1
COUNTER 2
A/D
I/O BUS
ANALOG ADDRESS BUS
LEVEL SHIFT
INVERTER
LEVEL SHIFT
FILTER
ANLG MUX 2
ANLG MUX 1
BUFFER
VREF
LPF
ZERO CROSS
PEAK HOLD
LFO
DIVIDED SIGNALS
BBD
FILTER
SYNTH VCA
DRIVER
VCO
INV
MUTE
GT VCA
CHORUS
CHANNEL L
CHANNEL R
LEVEL
OUTPUT
ALL JACKS
GUITAR
PROTECT
TUNE
PROGRAMMER
MIDI OUT
UNLESS OTHERWISE SPECIFIED
ALL PNP TRANSISTORS: 2SA933
ALL NPN TRANSISTORS: 2SC945-Q
ALL FETs : 2SK30ATM-GR
ALL DIODES : 1S2473

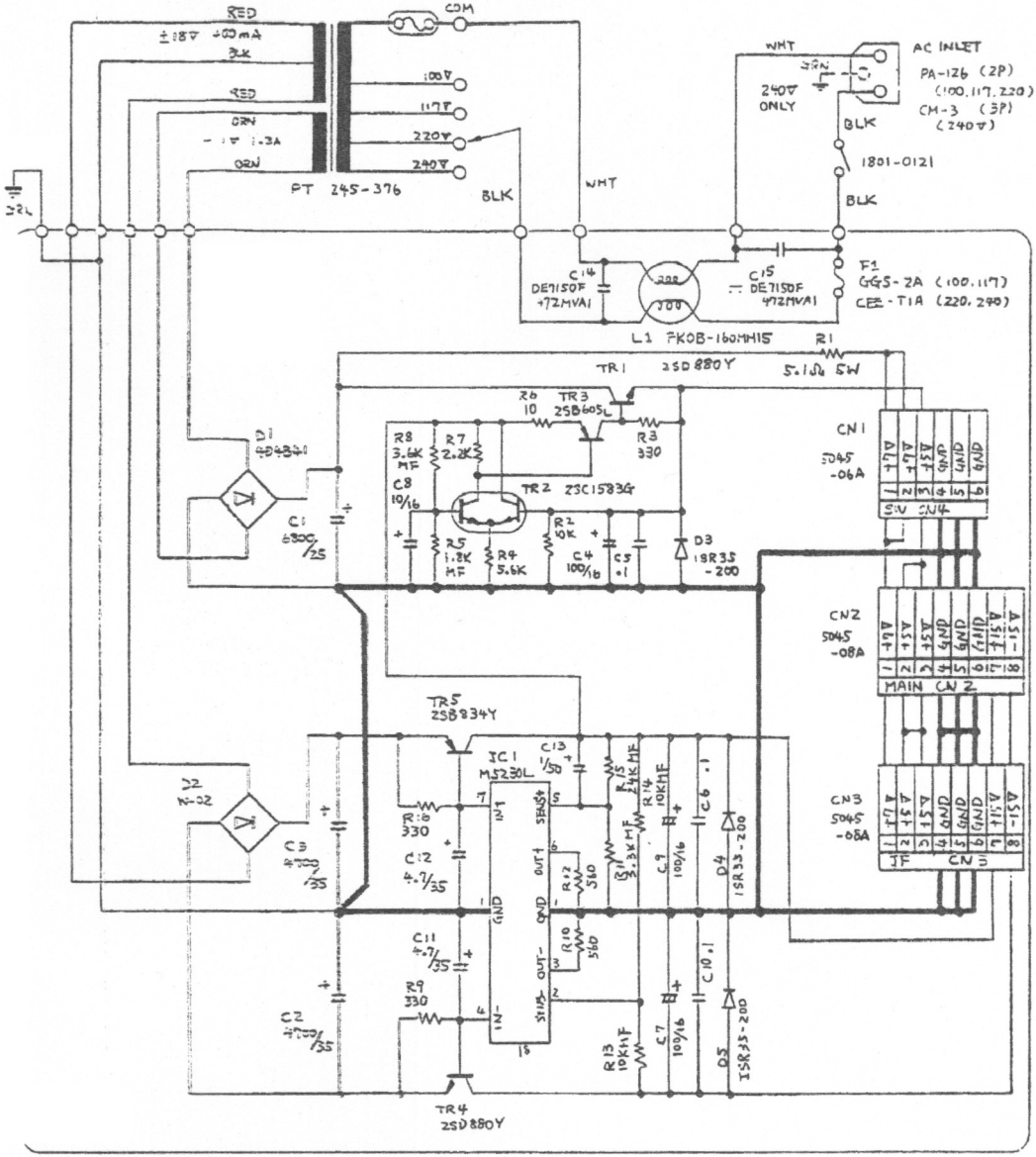
MAIN BOARD
7922404000
(pcb 2291391601)



POWER SUPPLY BOARD

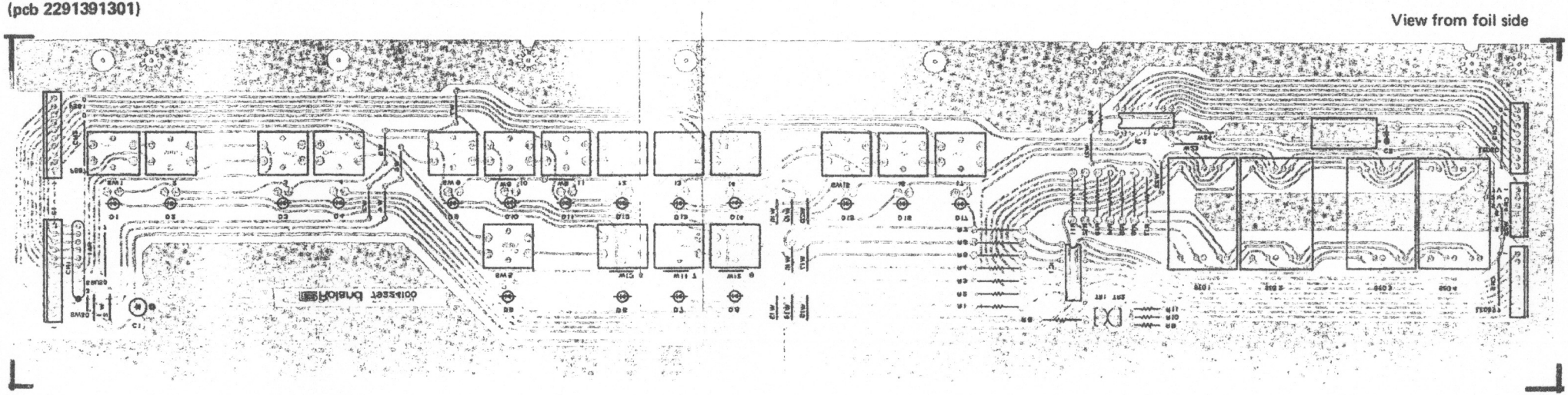
7922405100 100V (pcb 2291391201)
7922405200 117V (pcb 2291391201)
7922405400 220V (pcb 2291391201)
7922405500 240V (pcb 2291391201)



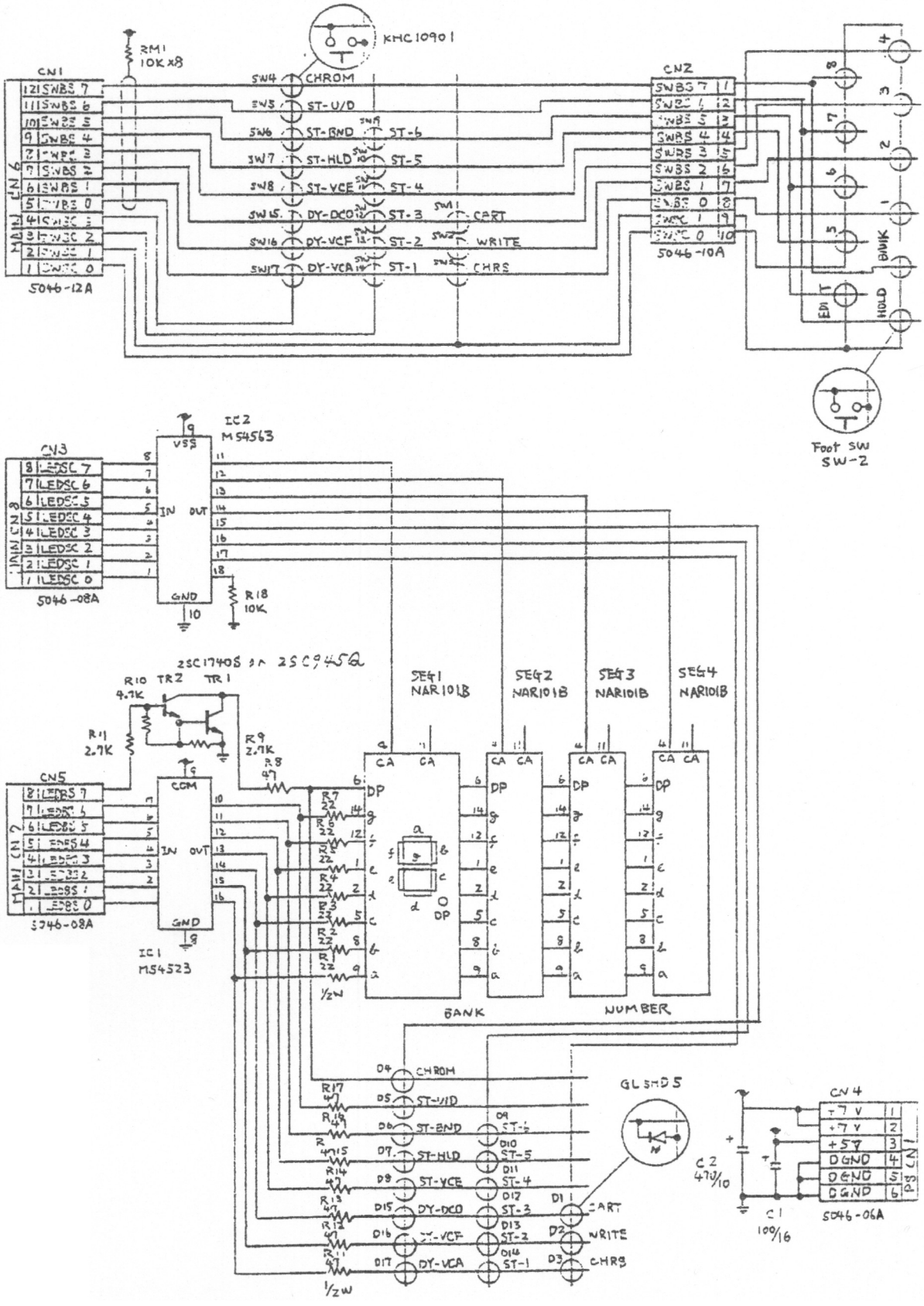

RED
±18V +50mA
BLK
RED
GRN
- 1V 1.3A
GRN
PT 245-376
COM
100V
117V
220V
240V
BLK
WHT
WHT
GRN
240V ONLY
AC INLET
PA-126 (2P)
(100, 117, 220)
CM-3 (3P)
(240V)
BLK
1801-0121
BLK
C14
DE7150F
472MVA1
C15
DE7150F
472MVA1
F1
GGS-2A (100, 117)
CEE-T1A (220, 240)
L1 FK0B-160MH15
R1
5.1Ω 5W
TR1 2SD880Y
R6
10
TR3
2SB605L
R8
3.6K
MF
R7
2.2K
R3
330
TR2 2SC1583G
C8
10/16
R5
1.8K
MF
R4
3.6K
R2
5K
C4
100/16
C5
.1
D3
1SR35
-200
D1
4D4B41
C1
6800
/25
CN1
5045
-06A
SUB CN4
CN2
5045
-08A
MAIN CN2
CN3
5045
-08A
JF CN3
TR5
2SB834Y
IC1
M5230L
C13
1/50
R15
24K MF
R14
10K MF
C6
.1
D4
1SR33-200
R16
330
C12
4.7/35
R12
360
R11
5.3K MF
C9
100/16
D5
1SR33-200
C10
.1
C11
4.7/35
R10
560
R9
330
C7
100/16
R13
10K MF
TR4
2SD880Y

SW BOARD
7922410000
(pcb 2291391301)

View from foil side

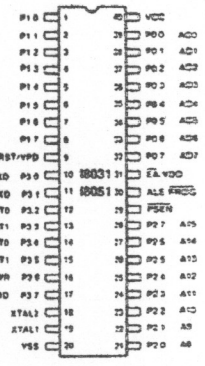


SW BOARD

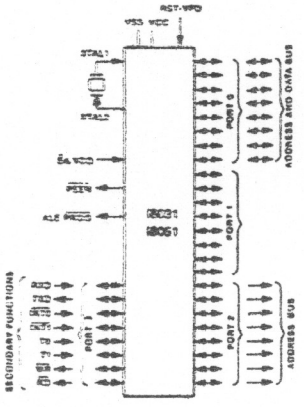

CN1
5046-12A
RM1
10K x8
KHC1090 1
SW4 CHROM
SW5 ST-U/D
SW6 ST-BND
SW7 ST-HLD
SW8 ST-VCE
SW15 DY-DCO
SW16 DY-VCF
SW17 DY-VCA
ST-6
ST-5
ST-4
ST-3
ST-2
ST-1
CART
WRITE
CHRS
CN2
5046-10A
BANK
HOLD
Foot SW
SW-2
CN3
5046-08A
IC2
M54563
VSS
GND
R18
10K
2SC1740S or 2SC945Q
TR1
TR2
R10
4.7K
R11
2.7K
R9
2.7K
R8
47
CN5
5746-08A
IC1
M54523
COM
IN
OUT
GND
R7
R6
R5
R4
R3
R2
R1
22
1/2W
SEG1
SEG2
SEG3
SEG4
NAR101B
CA
DP
BANK
NUMBER
D4 CHROM
D5 ST-U/D
D6 ST-BND
D7 ST-HLD
D8 ST-VCE
D15 DY-DCO
D16 DY-VCF
D17 DY-VCA
D9 ST-6
D10 ST-5
D11 ST-4
D12 ST-3
D13 ST-2
D14 ST-1
D1 CART
D2 WRITE
D3 CHRS
R17
R16
R15
R14
R13
R12
R11
47
GLSND 5
CN4
+7V
+5V
DGND
C2
470/10
C1
100/16
5046-06A
PSCN1

IC DATA

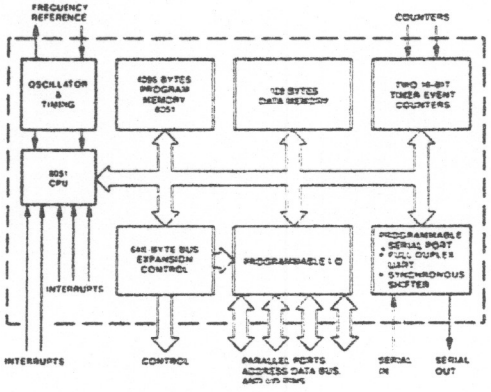
i8031/i8051



Pin Configuration



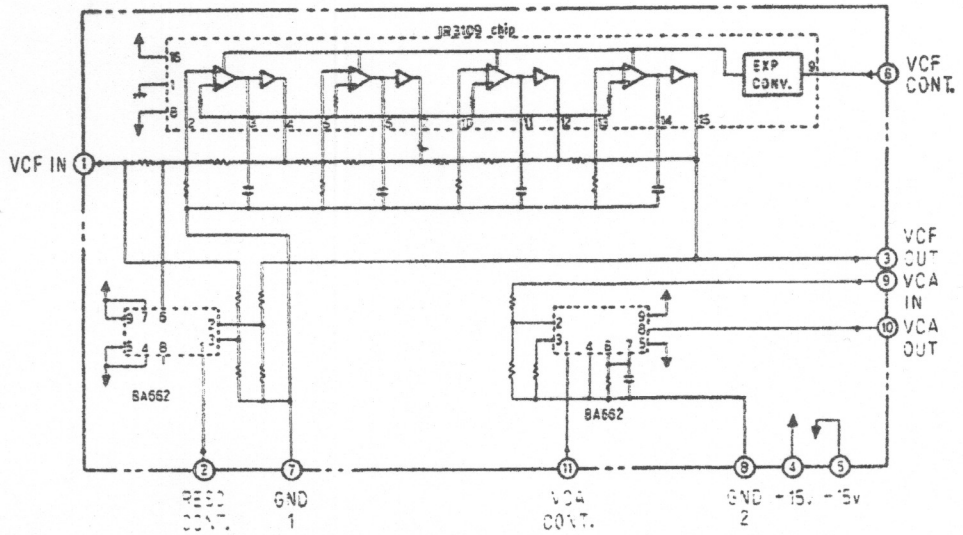
Logic Symbol



Block Diagram

A1QH800170, A1QH80017A

VCF VCA



ADJUSTMENT

The GR-700 is provided with a test program. When in test mode the test program is dumped into BANK 1 area of Main Board RAM. At the same time factory presets for BANKs 1–3 are also dumped into BANKs 2–4 as shown in the table. (These factory presets have no relation to the adjustments and can be ignored.)
Therefore, if necessary, BANKs 1 to 4 should be saved into the memory cartridge before performing adjustment.

DATA	BANK
TEST	1
BANK 1	2
BANK 2	3
BANK 3	4

ENTERING TEST MODE

1. Switch the power OFF.
2. Set MEMORY PROTECT to OFF.
3. While pressing MEMORY WRITE and STRING SELECT NO.6, turn the power ON.
   The test program will be loaded into BANK 1.
4. Allow for about 10 minutes as a warmup.

INSTRUMENTS
Digital voltmeter (DVM): 3-1/2 digits minimum
Oscilloscope(scope)
Roland G-series Guitar controller

. VREF
Main Board

-1. Connect DVM between TP2 VREF and DG (digital ground).
-2. Adjust VR6 for a 4.7 ± 0.01V reading.

. DCO-1
Main Board

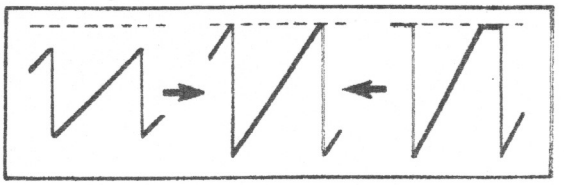
-1. Select BANK 1 and PATCH 1.
-2. Set TUNE (rear panel) to the center.
-3. Set BALANCE on the guitar for suitable guitar and synthesizer sound volumes.
-4. Adjust L2 (TUNE 1) on the PCB for zero beat.

. DCO-2
Main Board

-1. Select BANK 1, PATCH 2.
-2. Turn BALANCE fully to SYNTH.
-3. Adjust L1 (TUNE 2) on the PCB for zero beat (DCO 1 and 2).

5. D/A OFFSET
Main Board

5-1. Connect scope to POLY OUT (IC60b pin 7) of the PCB.
5-2. Select BANK 1, PATCH 1.
5-3. Pick first open string.
5-4. Adjust VR5 (D/A OFFSET) for the onset of clipping.



6. LEVEL
Main Board

6-1. Select BANK 1, PATCH 3.
6-2. Connect scope to POLY OUT (IC60b pin 7).
6-3. Adjust VR2 (LEVEL) of each channel for 800mV to 1Vp-p.

7. VCA DC BALANCE
Main Board

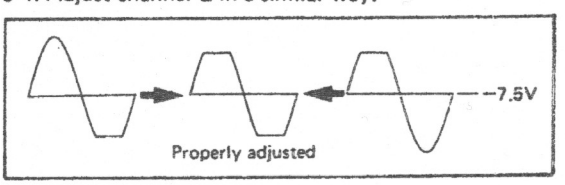
7-1. Select BANK 1, PATCH 4.
7-2. Play tremolo on the first string and adjust VR4 (DCBAL) of channel 1 for the minimum click sound.
7-3. In the similar manner, adjust channels 2 to 4.

8. VCF
Main Board

8-1. Select BANK 1, PATCH 5.
8-2. Connect the scope to POLY OUT (IC60b pin 7).
8-3. Pick first string and adjust VR3 (COF) of channel 1 for 1kHz. Also adjust VR1 (RESO) for 400mVp-p.
8-4. In the same manner, adjust channels 2 to 4.

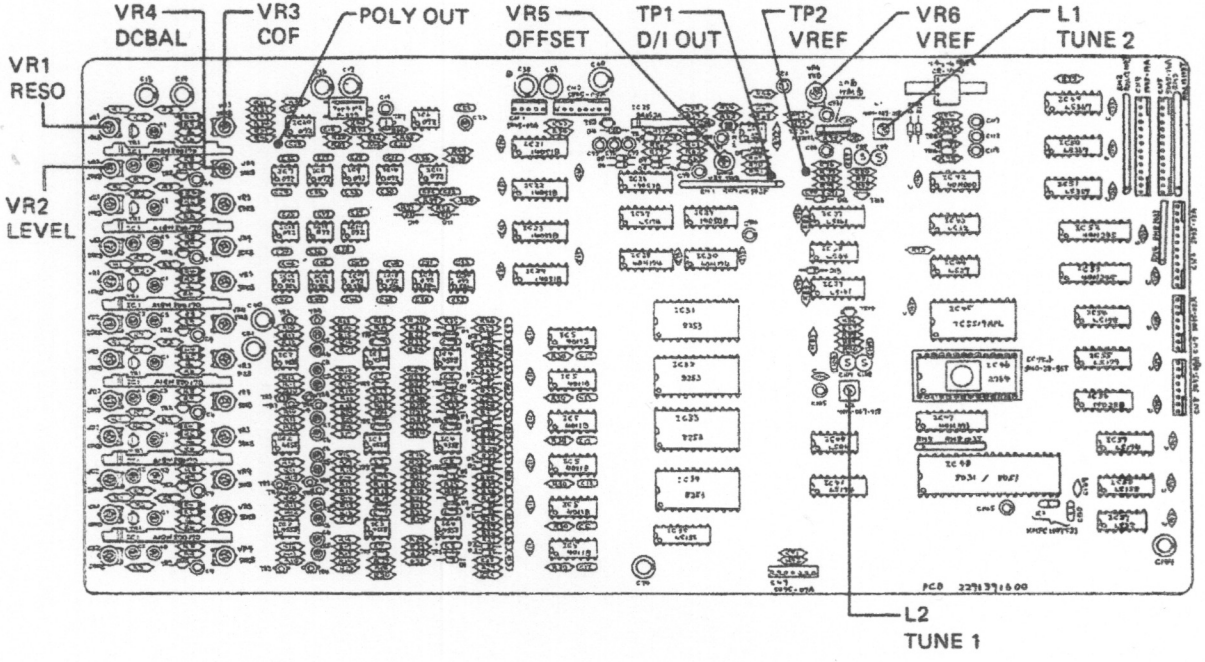
9. CHORUS BIAS
Interface Board

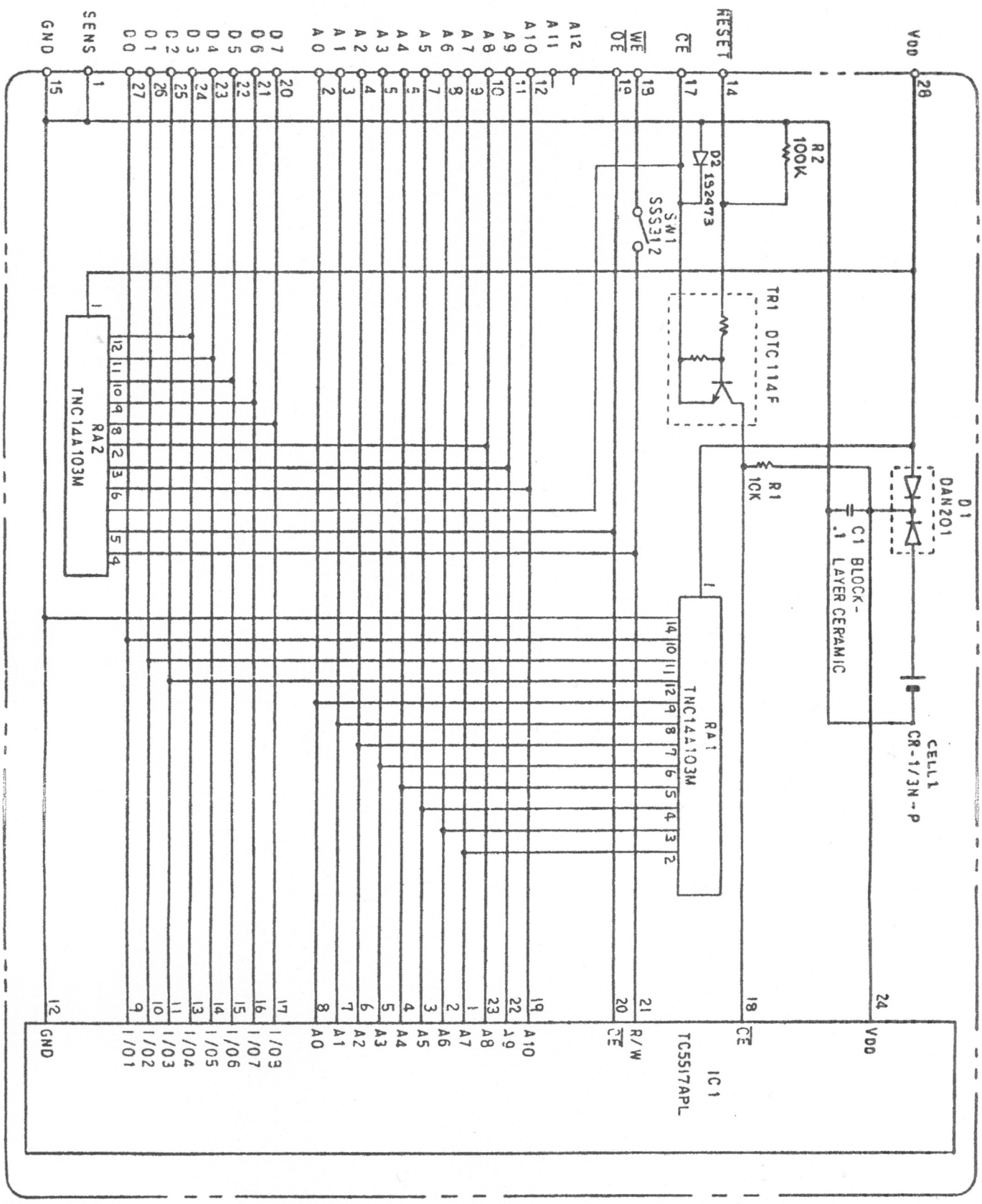
9-1. Select BANK 1, CHANNEL 1. Press CHORUS for ON.
9-2. Connect the scope to TP1 of channel R of the PCB. (scope: DC couple, 5V/div. preferable)
9-3. Pluck any 3 strings (out of harmony - - open string) simultaneously and adjust VR1 (BBD BIAS) so that the positive and negative tops are clipped to the same degree.
9-4. Adjust channel L in a similar way.

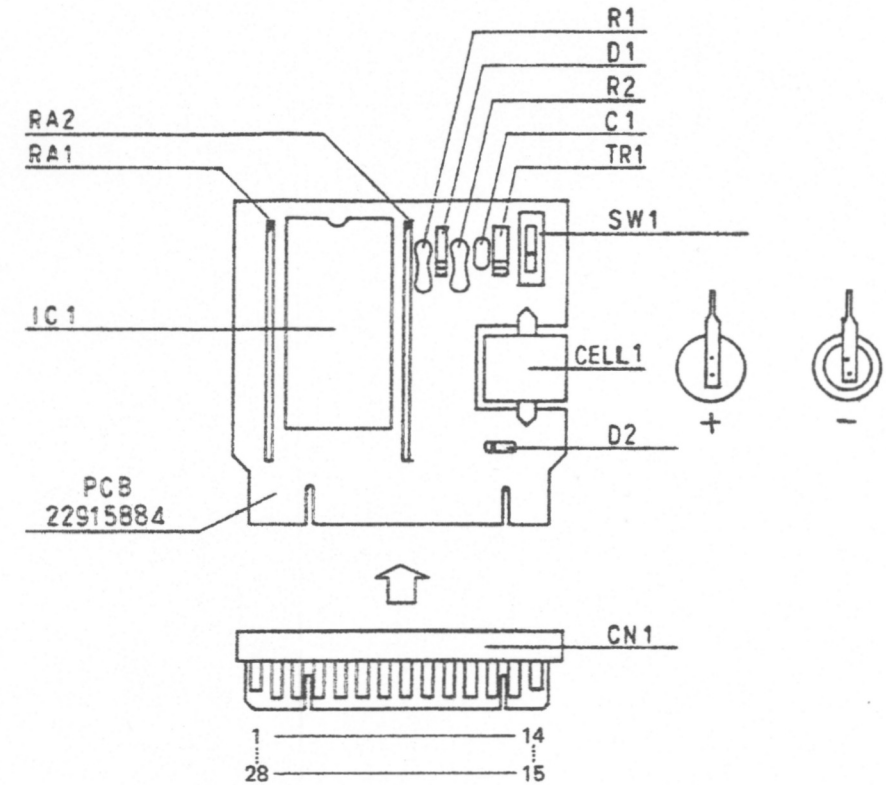


10. Load BANK 1 to BANK 4 with data from the memory cartridge.

11. PROTECT ON.




VDD
RESET
CE
WE
OE
A12
A11
A10
A9
A8
A7
A6
A5
A4
A3
A2
A1
A0
D7
D6
D5
D4
D3
D2
D1
D0
SENS
GND
R2 100K
D2 1S2473
SW1 SSS312
TR1 DTC114F
R1 1CK
D1 DAN201
C1 BLOCK-.1 LAYER CERAMIC
CELL1 CR-1/3N-P
RA1 TNC14A103M
RA2 TNC14A103M
IC1 TC5517APL
R/W
CE
VDD
GND
I/O3
I/O7
I/O6
I/O5
I/O4
I/O3
I/O2
I/O1


R1
D1
R2
C1
TR1
RA2
RA1
SW1
IC1
CELL1
D2
+
−
PCB
22915884
CN1
1
14
28
15


DTC114F
G
OUT
IN
DAN201
COM

MIDI IMPLEMENTATION

1. TRANSMITTED DATA

The GR-700 always transmits data in channel 1 POLY mode.

Status	Second	Third	Description
1001 0000	0kkk kkkk	0vvv vvvv	Note on kkkkkkk = 36 - 96
1001 0000	0kkk kkkk	0000 0000	Note off kkkkkkk = 36 - 96
1011 0000	0100 0000	0111 1111	hold on
1011 0000	0100 0000	0000 0000	hold off
1100 0000	0ppp pppp		Program Change ppppppp = 0 - 127
1011 0000	0111 1011	0000 0000	ALL NOTES OFF
1011 0000	0111 1100	0000 0000	OMNI OFF
1011 0000	0111 1111	0000 0000	POLY ON

Notes: *1 If enabled.
*2 If enabled.
*3 Whe all notes turn OFF, this message is sent.
*4 See next section.

Program change assignments are as follows:

For internal memory

bank \ patch	1	2	3	4	5	6	7	8
	program change numbers							
1	0	1	2	3	4	5	6	7
2	8	9	10	11	12	13	14	15
3	16	17	18	19	20	21	22	23
4	24	25	26	27	28	29	30	31
5	32	33	34	35	36	37	38	39
6	40	41	42	43	44	45	46	47
7	48	49	50	51	52	53	54	55
8	56	57	58	59	60	61	62	63

For memory cartridge

bank \ patch	1	2	3	4	5	6	7	8
	program change numbers							
1	64	65	66	67	68	69	70	71
2	72	73	74	75	76	77	78	79
3	80	81	82	83	84	85	86	87
4	88	89	90	91	92	93	94	95
5	96	97	98	99	100	101	102	103
6	104	105	106	107	108	109	110	111
7	112	113	114	115	116	117	118	119
8	120	121	122	123	124	125	126	127

2. FRONT PANEL CODED FUNCTION

If the power switch is turned on while pressing one of the STRING SELECT switches. MIDI functions are enabled for transmission as follows:

switch	function
1	HOLD ON/OFF
2	PROGRAM CHANGE
3	transmits OMNI OFF and POLY ON once

Simply turn on the power, all mentioned functions are disabled.