MANUAL NO. 993-045393-002

TECHNICAL SERVICE INFORMATION for

moog THE SOURCE

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CAUTION

These servicing instructions are for use by qualified personnel only. To avoid risk of electric shock, do not perform any servicing other than that described in the Owner's Manual unless you are qualified to do so. Refer all servicing to qualified service personnel.

MOOG MUSIC INC.
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MOOG MUSIC
p/a Waalhaven Zuid Zijde 48, 3088 HJ, Rotterdam, The Netherlands

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SPECIFICATIONS

KEYBOARD
Description: 37 Note C to C, Low note priority
Keyboard Transpose: +1 Octave (Left hand control)
Glide Time: Linear, continuously variable from less than 2 msec to 5 sec (bottom to top of keyboard)

MODULATION
Rate: Continuously variable from 0.25Hz to 325Hz
Amount (Square wave): Oscillator, zero to 16 semitones
Filter, zero to 5 octaves

OSC 1 AND OSC 2
Reference frequency: Low C 32', 32.7Hz +/- 0.1Hz
Scale factor accuracy: 0.21% from 65Hz to 1.5kHz
Range drift due to temp: 0^{o}C to 40^{o}C less than 0.02%/^{o}C
Pulse duty cycle: Continuously variable from 5% to 95%
Octave accuracy: 0.2%
Output level range: 80dB
Interval range: 2.1 Octaves
Interval cal range: +/- 3%

VCF
Type: Low pass 24dB/octave cutoff slope with variable height resonant peak at cutoff frequency.
Range of cutoff: 30Hz to 25kHz
Keyboard tracking accuracy: Full mode, .05% (30Hz to 20kHz)
Sweep of cutoff frequency by contour generator: 10 octaves

CONTOUR GENERATORS
Type: Microprocessor controlled ADSR, retriggerable
Range of attack, decay, release times: 1 msec to 10 sec.
Range of sustain level: 0 to 100% of peak contour

VCA
Audio output level: 0dBm
Dynamic range: 80dB
Output offset: Less than 100MV

REAR PANEL I/O
Fine tune: +/- 3 semitones
KB CV IN/OUT: 1 V/octave +/- 2%
Input impedance = 50K ohm
Output impedance = 1K ohm
S-Trigger in: Switch closure to ground triggers contour generators, input impedance greater than 1K ohm
S-Trigger out: Trigger on is switch closure to ground
Cassette I/O: Tape interface with transport on/off control
Audio Output: 0dBm, Output impedance = 600 ohms

POWER REQUIREMENTS
Operating voltage range
Domestic: 95 to 130 VAC 60Hz
Export: 200 to 260 VAC 50Hz
Power consumption: Less than 30 watts

DIMENSIONS AND WEIGHT
Overall size: 26-3/8" wide, 12-1/2" deep, 3" high (67cm x 31.75cm x 7.62cm)
Net weight: 22 lbs. (48.51kg)

WARNING

Hazardous voltages are present in power supply circuit. Disconnect AC supply cord prior to disassembly. Exercise care when making tuning adjustments with unit operating to avoid contact with exposed wiring near primary switch and fuse holder.

CAUTION

Digital Memory circuits are powered by a 3V lithium battery, BT-1. DO NOT short circuit, overload or attempt to charge this cell. Explosion and release of corrosive chemicals may result.

DISASSEMBLY PROCEDURE

NOTE

Before proceding with disassembly, take care to protect finished wood and lacquered metal parts from sharp objects. Use carpeted or similarly protected surface.

To gain access to tuning adjustments, bottom assembly including keyboard must be separated from upper housing. Start by removing (2) screws from lower rear panel located on either side of Moog logo.

Place unit upside down and remove (4) screws holding bottom to wood ends. Remove rear keyboard mounting screws near center of bottom and loosen (3) front keyboard machine screws until they are finger tight.

Place unit on its feet, lift rear edge approximately one inch and tilt forward to release housing from front groove.

Slide housing forward to clear keys. Lift and rotate front of housing up and rest on rear panel. Take care not to stress flexible "tails" on membrane switch which connect this panel to a P.C. Board at rear of unit.

Carefully r
board mounting
Lower base, rem
left side. Use a s
up housing to ga

Incrementa
screws located u
remove knob fo

Power Sup
screws at front a
plate at rear, wh
housing. Power
removed withou

Digital and
by plastic clips.
clips to avoid br
required.

POW

REF DESIG	
P11	Header, 3 P
P12	Header, 3 P
P13	Header, 10
P14	Header, 10
P15	Header, 10
P16	Header, 8 P
U1	IC, Voltage
U2	IC, Operati
U3	IC, Voltage
U4	IC, Voltage
Q1	Transistor,
Q2	Transistor,
Q3	Transistor,
Q4	Transistor,
CR1	Diode, Rect
CR2	Diode, Rect
CR3	Diode, Rect
CR4	Diode, Rect
CR5	Diode, Zene
CR6	Diode, Rect
CR7	Diode, Rect
CR8	Diode, Rect
CR9	Diode, Rect
CR10	Diode, Rect
CR11	Diode, Rect
CR12	Diode, Rect
CR13	Diode, Rect
C1	Capacitor, T
C2	Capacitor, T
C3	Capacitor, E
C4	Capacitor, E
C5	Capacitor, T
C6	Capacitor, T
C7	Capacitor, F
C8	Capacitor, T
C9	Capacitor, T
C10	Capacitor, T
C11	Capacitor, E
C12	Capacitor, T
C13	Capacitor, T
R4	Resistor, Tr
R14	Resistor, Tr

Carefully rotate base up to gain access to keyboard mounting screws and remove (3) front screws. Lower base, remove keyboard assembly and set to left side. Use a screwdriver or similar tool to prop up housing to gain access to trim adjustments.

Incremental control assembly is retained by (2) screws located under knob. Loosen set screw and remove knob for access.

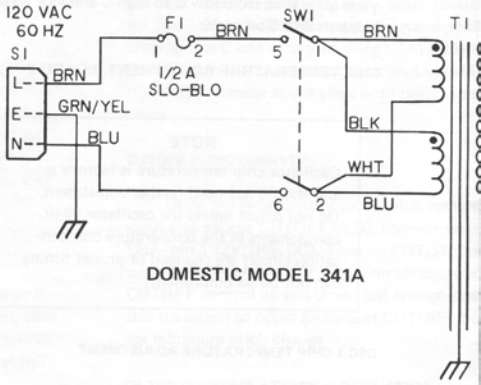
Power Supply P.C. board is retained by (2) screws at front and an aluminum heat sink coupler plate at rear, which in turn is bolted to rear of housing. Power transistors are socketed and can be removed without removal of P.C. board.

Digital and Synth Board assemblies are retained by plastic clips. Care should be taken when bending clips to avoid breakage should board removal be required.

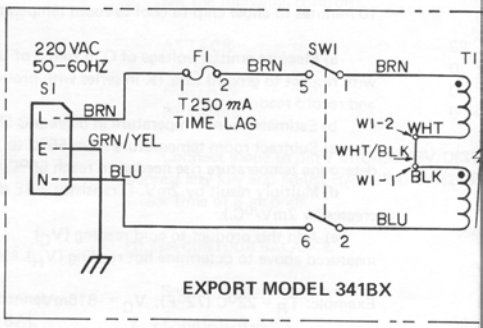
NOTES:

1. UNLESS OTHERWISE SPECIFIED –
   ALL RESISTORS ARE IN OHMS, 1/4W, ± 5%.
   ALL CAPACITORS ARE IN MFD (μF).
   ALL DIODES ARE IN4004.

* 2. F2, F3 & F4 USED ON EXPORT 220VAC ONLY.



DOMESTIC MODEL 341A



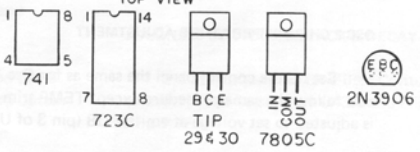
EXPORT MODEL 341BX

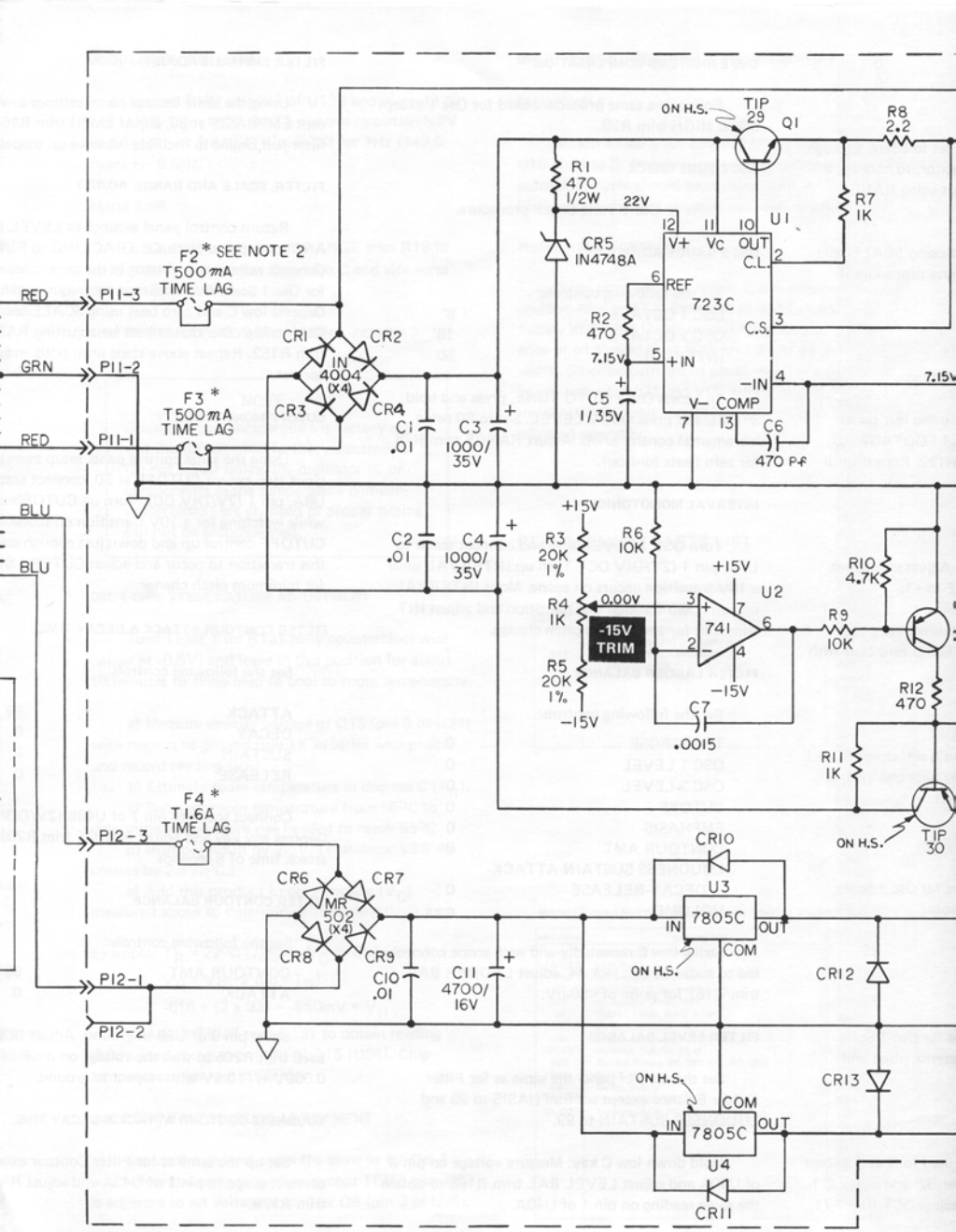
POWER SUPPLY PRINTED CIRCUIT BOARD 1

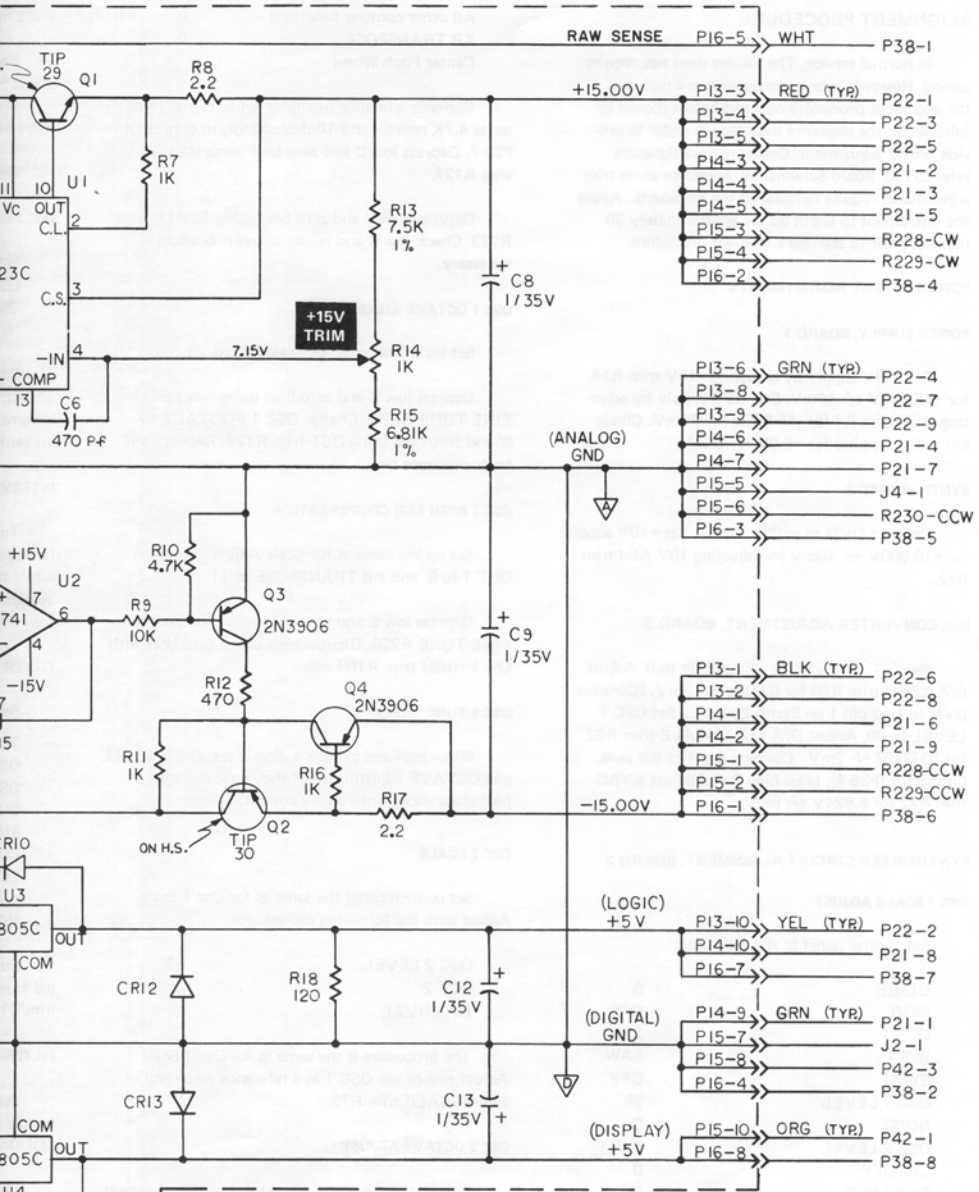
REF DESIG	DESCRIPTION	PART NO.
P11	Header, 3 Pin, .156 Ctr. Locking	910-042531-003
P12	Header, 3 Pin, .156 Ctr. Locking	910-042531-003
P13	Header, 10 Pin, .100 Ctr.	910-040299-010
P14	Header, 10 Pin, .100 Ctr.	910-040299-010
P15	Header, 10 Pin, .100 Ctr.	910-040299-010
P16	Header, 8 Pin, .100 Ctr.	910-040299-008
U1	IC, Voltage Reg., 723C	991-041484-001
U2	IC, Operational Amplifier, 741	991-041119-002
U3	IC, Voltage Reg., +5V, 1A, 7805C	991-045309-001
U4	IC, Voltage Reg., +5V, 1A, 7805C	991-045309-001
Q1	Transistor, NPN Power, Tip 29	991-041049-001
Q2	Transistor, PNP Power, Tip 30	991-041050-001
Q3	Transistor, PNP, 2N3906	991-041052-002
Q4	Transistor, PNP, 2N3906	991-041052-002
CR1	Diode, Rectifier, 1N4004	919-042019-001
CR2	Diode, Rectifier, 1N4004	919-042019-001
CR3	Diode, Rectifier, 1N4004	919-042019-001
CR4	Diode, Rectifier, 1N4004	919-042019-001
CR5	Diode, Zener, 1N4748A	919-041255-002
CR6	Diode, Rectifier, MR502	919-041157-001
CR7	Diode, Rectifier, MR502	919-041157-001
CR8	Diode, Rectifier, MR502	919-041157-001
CR9	Diode, Rectifier, MR502	919-041157-001
CR10	Diode, Rectifier, 1N4004	919-042019-001
CR11	Diode, Rectifier, 1N4004	919-042019-001
CR12	Diode, Rectifier, 1N4004	919-042019-001
CR13	Diode, Rectifier, 1N4004	919-042019-001
C1	Capacitor, Tubular, .01uf	947-045011-103
C2	Capacitor, Tubular, .01uf	947-045011-103
C3	Capacitor, Electrolytic, 1000 uf/35V	945-040209-011
C4	Capacitor, Electrolytic, 1000 uf/35V	945-040209-011
C5	Capacitor, Tantalum, 1 uf/35V	946-040231-009
C6	Capacitor, Tubular, 470 pf	947-045008-471
C7	Capacitor, Polyester, .0015 uf	946-041978-152
C8	Capacitor, Tantalum, 1 uf/35V	946-040231-009
C9	Capacitor, Tantalum, 1 uf/35V	946-040231-009
C10	Capacitor, Tubular, .01 uf	947-045011-103
C11	Capacitor, Electrolytic, 4700 uf/16V	945-040209-037
C12	Capacitor, Tantalum, 1 uf/35V	946-040231-009
C13	Capacitor, Tantalum, 1 uf/35V	946-040231-009
R4	Resistor, Trim, Cermet, 1K	925-042389-003
R14	Resistor, Trim, Cermet, 1K	925-042389-003

COMPONENT BASING

TOP VIEW




RED
P11-3
F2 * SEE NOTE 2
T500mA
TIME LAG
GRN
P11-2
F3 *
T500mA
TIME LAG
RED
P11-1
BLU
BLU
CR1
CR2
IN
4004
(X4)
CR3
CR4
C1
.01
C3
1000/
35V
C2
.01
C4
1000/
35V
ON H.S.
TIP
29
Q1
R8
2.2
R1
470
1/2W
22V
R7
1K
CR5
IN4748A
U1
12
11
10
V+
Vc
OUT
C.L.
2
6
REF
723C
C.S.
3
R2
470
7.15V
5
+IN
-IN
4
7.15V
C5
1/35V
V- COMP
7
13
C6
470 P-F
+15V
R6
10K
R3
20K
1%
+15V
U2
R10
4.7K
R4
1K
0.00V
-15V
TRIM
3
7
741
6
R9
10K
2
4
R5
20K
1%
-15V
-15V
C7
.0015
R12
470
R11
1K
ON H.S.
TIP
30
F4 *
T1.6A
TIME LAG
P12-3
CR6
CR7
MR
502
(X4)
CR8
CR9
CR10
U3
7805C
IN
OUT
COM
ON H.S.
CR12
P12-1
P12-2
C10
.01
C11
4700/
16V
ON H.S.
CR13
COM
IN
7805C
OUT
U4
CR11



BOARD 1

THE SOURCE POWER SUPPLY SCHEMATIC

OLDSCHOOL-SOUND
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ALIGNMENT PROCEDURE

In normal service, The Source does not require tuning. However, when components are replaced, the alignment procedure outlined below should be followed in the sequence indicated in order to provide proper adjustment. Component designators refer to P.C. Board Schematics. Access to some trim adjustments require removal of the keyboard. Allow the instrument to warm up for approximately 30 minutes prior to starting alignment procedure.

POWER SUPPLY ADJUSTMENTS

POWER SUPPLY, BOARD 1

Set +15V supply by adjusting +15V trim R14 for +15.000V +/- 10mV. Set –15V supply by adjusting -15V trim R4 for -15.000V +/- 10mV. Check both +5V supplies for +5.0V +/- 0.2V.

SYNTH, BOARD 2

Connect DVM to emitter of Q1. Set +10V supply for +10.000V +/- 10mV by adjusting 10V ADJ trim R12.

D/A CONVERTER ADJUSTMENT, BOARD 3

Put OSC 1 LEVEL in edit and set to 0. Adjust D/A ZERO trim R60 for 0.000V +/- 2mV. (Connect DVM to U12 pin 1 on Synth Board 2.) Set OSC 1 LEVEL to 99. Adjust D/A FULL SCALE trim R62 for 10.000V +/- 2mV. Connect DVM to KB buss, Connector (P36-4), press high C and adjust KYBD trim R72 for 8.824V +/- 5mV.

SYNTHESIZER CIRCUIT ALIGNMENT, BOARD 2

OSC 1 SCALE ADJUST

Set control panel to the following:

GLIDE	0
MOD	OFF
OCT 1	32'
W/S 1	SAW
SYNC	OFF
OSC 1 LEVEL	99
NOISE	0
OSC 2 LEVEL	0
CUTOFF	0
EMPHASIS	0
COUTOUR AMT	99
Both SUSTAINS	99
All other contour functions	0
KB TRANSPOSE	0
Center Pitch Wheel	

Connect reference oscillator set to 65Hz, through series 4.7K resistor and 10uf capacitor, to connector P23-7. Depress low C and zero beat using RANGE trim R127.

Depress high C and zero beat using SCALE trim R123. Check low C and repeat above procedure if necessary.

OSC 1 OCTAVE ADJUST

Set up the same as for Scale Adjust.

Depress low C and zero beat using rear panel FINE TUNE R228. Change OSC 1 FOOTAGE to 8' and zero beat using OCT trim R122. Repeat until both ends zero beat.

OSC 1 HIGH END COMPENSATION

Set up the same as for Scale Adjust except set OCT 1 to 8' and KB TRANSPOSE to +1.

Depress low C and zero beat using rear panel FINE TUNE R228. Depress high C and zero beat with Osc 1 HIGH trim R100.

OSC 1 TUNE CHECK

When high end compensation is set, check SCALE and OCTAVE adjustments. If they have changed, repeat steps above until all are correct.

OSC 2 SCALE

Set control panel the same as for Osc 1 Scale Adjust with the following exceptions:

OSC 2 LEVEL	99
OCT 2	32'
INTERVAL	1

The procedure is the same as for Osc 1 Scale Adjust except use OSC 1 as a reference pitch and adjust SCALE trim R72.

OSC 2 OCTAVE ADJUST

Follow the same procedure used for Osc 1 except change OSC 2 FOOTAGE between 32' and 8' (OSC 1 FOOTAGE remains at 16') and adjust OCT trim R71.

OSC 2 H

F
adjust

OSC 2 T

R

OSC 2 F

Se
OS
OS
IN

To
STORE
increme
for zero

INTERV

Tu
U7A, p
a 10V t
up and
trim R7

FILTER

Se

TR
OS
OS
CU
EM
CO
LO

VC

Str
ted to a
trim R1

FILTER

Set
Ladder
LOUDN

Ho
of U40A
the same

OSC 2 HIGH END COMPENSATION

Follow the same procedure used for Osc 1 except adjust HIGH trim R39.

OSC 2 TUNE CHECK

Refer to Osc 1 Tune Check procedure.

OSC 2 RANGE ADJUST

Set the following controls:

OSC 1 OCTAVE	8'
OSC 2 OCTAVE	16'
INTERVAL	50

To access Osc 2 AUTO TUNE, press and hold STORE and press OSC 2 LEVEL. Set to 50 using incremental control knob. Adjust RANGE trim R78 for zero beats (unison).

INTERVAL MONOTONICITY

Turn OSC 1 LEVEL to 0 and connect scope to U7A, pin 1 (2V/DIV DC). Turn up INTERVAL until a 10V transition occurs on scope. Move INTERVAL up and down through this transition and adjust INT trim R70 for a minimum pitch change.

FILTER LADDER BALANCE

Set the following controls:

TRANSPOSE	0
OSC 1 LEVEL	0
OSC 2 LEVEL	0
CUTOFF	0
EMPHASIS	0
CONTOUR AMT	0
LOUDNESS SUSTAIN-ATTACK-DECAY-RELEASE	0
VOLUME	max

Strike low C repeatedly and with scope connected to audio output jack J4, adjust LADDER BAL trim R167 for pulse of <50mV.

FILTER LEVEL BALANCE

Set the control panel the same as for Filter Ladder Balance except set EMPHASIS to 99 and LOUDNESS SUSTAIN to 99.

Hold down low C key. Measure voltage on pin 3 of U40A and adjust LEVEL BAL trim R168 to obtain the same reading on pin 1 of U40A.

FILTER EMPHASIS ADJUST

Using the same control panel settings as above except EMPHASIS at 80, adjust EMPH trim R164 until filter just begins to oscillate (observe on scope).

FILTER, SCALE AND RANGE ADJUST

Return control panel settings to LEVEL BALANCE setup and place KB TRACKING to FULL. Connect reference oscillator in the same manner used for Osc 1 Scale Adjust except set frequency at 80Hz. Depress low C and zero beat using SCALE trim R155. Depress high C and zero beat by adjusting RANGE trim R152. Repeat above steps until both ends are correct.

CUTOFF MONOTONICITY

Using the same control panel setup as in the previous step except CUTOFF at 50, connect scope to U8A, pin 1 (2V/DIV DC). Turn up CUTOFF control while watching for a 10V transition on scope. Turn CUTOFF control up and down just enough to cause this transition to occur and adjust CUTOFF trim R146 for minimum pitch change.

FILTER CONTOUR ATTACK & DECAY TIME

Set the following controls:

ATTACK	99
DECAY	0
SUSTAIN	0
RELEASE	0

Connect scope to pin 7 of U43B (2V/DIV DC). Depress any key and adjust RANGE trim R201 for attack time of 8 seconds.

FILTER CONTOUR BALANCE

Set the following controls:

CONTOUR AMT	99
ATTACK	0

Short pin 9 of U26 to ground. Adjust CONTOUR BAL trim R205 so that the voltage on pin 6 of U45 is 0.000V +/- 10mV with respect to ground.

LOUDNESS CONTOUR ATTACK & DECAY TIME

Set up the same as for Filter Contour except connect scope to pin 1 of U43A and adjust RANGE trim R179.

MODULATION OSC RATE

Connect DVM to pin 7 of U13B and scope to pin 7 of U48B. Turn MOD RATE control to obtain 5.2V reading. Adjust RANGE trim R223 for 7Hz (142.6 msec) +/- 0.5Hz.

GLIDE TIME

Set GLIDE to 99. Adjust RANGE trim R19 to yield glide time from low C to high C and vice versa between 3 to 5 seconds.

CHIP TEMPERATURE ADJUSTMENT, BOARD 2

> **NOTE**
>
> Oscillator chip temperature is factory set and should not need further adjustment. Do not adjust unless the oscillator IC or components in the temperature compensation circuit are changed or proper tuning can not be accomplished.

OSC 1 CHIP TEMPERATURE ADJUSTMENT

Turn TEMP trim R131 fully counterclockwise (wiper at -0.6V) and leave in this position for about 10 minutes to allow chip to cool to room temperature.

a) Measure emitter voltage of Q15 (pin 3 of U34) with respect to ground (use 1K in series with probe) and record reading (V_C).

b) Estimate room temperature in degrees C (T_R).

c) Subtract room temperature from 55°C to determine temperature rise needed to reach 55°C.

d) Multiply result by 2mV. (Transistor VBE decreases by 2mV/°C.)

e) Add this product to cold reading (V_C) measured above to determine hot reading (V_H).

Example: T_R = 22°C (72°F); V_C = -616mV;

$V_H = V_C + 2 (55 - T_R)$

$-616 + (2 \times 33) = -550mV = V_H$

f) Adjust TEMP trim R131 to obtain reading determined above at emitter of Q15 (U34). Chip temperature now set at 55°C.

OSC 2 CHIP TEMPERATURE ADJUSTMENT

Set up the control panel the same as for Osc 1 and follow the same procedure except TEMP trim R83 is adjusted to set voltage at emitter Q8 (pin 3 of U26).

INCREMENTAL CONTROL CHECK, BOARD 3

DUTY CYCLE

Attach a dual trace scope at U19 pin 6 (ϕ1) and U19 pin 4 (ϕ2). Rotate incremental control and note pulse duty cycle should be nominal 50% +/- 25%. Check clockwise and counterclockwise rotation.

PHASE RELATIONSHIPS

Using same setup as above, check phase of the positive edge of ϕ1 in comparison to ϕ2 at approximately 250 RPM (1kHz output frequency). Positive edge of ϕ1 should be at 50% +/- 10% of ϕ2 pulse width. Since adjustment of phase requires a change in gap between VQ1 and VQ2 OPTO interruptors, malfunctioning unit should be replaced with a factory adjusted assembly.

REPLACEMENT PARTS LIST

STANDARDIZED COMPONENTS

REF DESIG	DESCRIPTION	PART NO. SERIES
RXX	Resistor, 1/4W, 5%, Carbon Film [Resistance (XX) (X) Multiplier]	852-312XXX-001
RXX	Resistor, 1/4W, 1%, Metal Film [Resistance (XXX) (X) Multiplier]	853-42XXXX-031

MISCELLANEOUS PRINTED CIRCUIT BOARDS, BOARD 4, BOARD 5 AND BOARD 6

REF DESIG	DESCRIPTION	PART NO.
P42	Header, CIS, Right Angle, .100 Ctrs.	910-042392-005
LED 1,2,3	LED, Red	939-041850-004
U1	IC, Decoder/Driver, 7447	991-041097-001
U2	Display, 1-1/2 Digit, MAN, 6630	939-042633-001
U3	IC, Decoder/Driver, 7447	991-041097-001
U4	Display, 1 Digit, MAN, 3610A	939-045310-001
U5	IC, Decoder/Driver, 7447	991-041097-001
U6	Display, 1 Digit, MAN, 3610A	939-045310-001
C1, C2	Capacitor, Tubular, .01 uf	947-045011-103
R26	Resistor, Rotary, 5K, 10% Log, VOLUME	925-045323-001
SW1	Switch, Blue, +1	960-040223-016
SW2	Switch, Blue, 0	960-040223-017
VQ1, VQ2	Opto-Interruptor, MCT8	939-045311-001
Q1, Q2	Transistor, NPN, 2N3904	991-041051-002

REF DESIG	DESCRIPTION	PART NO.
BD. 1	P.C. Board Assy., Power Supply	996-045281-001
*BD. 1	P.C. Board Assy., Power Supply, Export	996-045281-002
BD. 2	P.C. Board Assy., Synthesizer	996-045266-001
BD. 3	P.C. Board Assy., Digital	996-045269-001
BD. 4	P.C. Board Assy., Display	996-045278-001
BD. 5	P.C. Board Assy., Octave	996-045275-001
BD. 6	P.C. Board Assy., Opto-Interruptor	996-045272-001
	Incremental Controller Assy.	997-045251-001
F1	Fuse, Slo Blo, 1/2 Ampere, 3AG	939-041620-003
*F1	Fuse, 250Ma, 5M x 20M	939-044094-006
*F2, *F3	Fuse, 500Ma, 5M x 20M	939-044094-008
F4	Fuse, 1.6A, 5M x 20M	939-044094-001
J1	Connector, 5 Pin DIN.	910-045322-005
J2	Jack, Phone, 3 Conductor, .250 Dia.	910-041306-004
J3	Jack, Phone, NC Switch, 3 Conductor, .250 Dia.	910-041306-011
J4	Jack, Phone, 1 Circ., .250 Dia.	910-041306-001
R228	Potentiometer, Rotary, 10K Lin., FINE TUNE	925-045056-001
R229	Potentiometer, Rotary, 10K Lin., PITCH WHEEL	925-040390-003
R230	Potentiometer, Rotary, 10K, Special Taper, MOD WHEEL	925-040269-001
S1	Receptacle, CEE-22	910-042913-001
S13, S14, S15	Connector, CIS, Socket, 10 Pin, .1 Ctr.	906-040298-010
S21, S22	Connector, CIS, Socket, 9 Pin, .1 Ctr.	906-040298-009
S34, S42	Connector, CIS, Socket, 5 Pin, .1 Ctr.	906-040298-005
S23, S37	Connector, CIS, Socket, 7 Pin, .1 Ctr.	906-040298-007
S16, S38	Connector, CIS, Socket, 8 Pin, .1 Ctr.	906-040298-008
S35, S36	Connector, CIS, Socket, 4 Pin, .1 Ctr.	906-040298-004
S24	Connector, CIS, Socket, 3 Pin, .1 Ctr.	906-040298-003
S11, S12	Connector, Socket, 3 Pin, .156 Ctr.	906-042406-003
SW1	Switch, Rocker, DPST, 250V, 8A	960-042800-001
T1	Transformer, 115V/230V	954-045298-001
	Receptacle, Fuse, Domestic.	906-041331-001
	Receptacle, Fuse, Export *	906-042911-001
	Heat Sink Coupler, Power Supply	968-045327-001
	Screw, No. 4-40 x 1/4 lg., Taptite.	903-042674-001
	Insulator, Mica, TIP Trans.	908-042730-001
	Washer, Insul., Shoulder	904-042729-001
	Socket, TIP Trans.	906-042676-001
	Fuse Clip, P.C. Mtd., 5mm	906-043605-001
	7 Pin SIP IC Socket	906-040307-007
	8 Pin DIP IC Socket	906-042012-008
	10 Pin SIP IC Socket	906-040307-010
	14 Pin DIP IC Socket	906-045188-014
	16 Pin DIP IC Socket	906-045188-016
	18 Pin DIP IC Socket	906-045188-018
	24 Pin DIP IC Socket	906-045188-024
	40 Pin DIP IC Socket	906-045188-040
	Wheel Assembly	997-041597-001
	Set Screw, Allen	903-040486-062
	Detent, Spring	961-041178-001
	Detent, Teflon	962-041179-001
	Knob Assy., Skirted	915-042764-943
	Knob, 1.5" Dia.	915-045331-001
	Keying Plug	910-040310-001
	Power Cord, USA, 120V, NEMA 5-15P	957-041794-001
	Power Cord, European, 250V, Type B	957-043400-001
	Power Cord, Australian, 250V, Type E	957-043400-004
	Power Cord, Swiss, 250V, Type C	957-043400-005
	Power Cord, UK, 250V, Type D	957-043400-007
	Foot, Rubber, 7/8" Dia. x 3/8"	916-042584-001
	Keyboard Assy., 37 Note, C to C	979-045315-001
	Machine Screw, M5 x 12mm	903-044310-001
	White Key C	964-044471-001
	White Key D	964-044471-002
	White Key E	964-044471-003
	White Key F	964-044471-004
	White Key G	964-044471-005
	White Key A	964-044471-006
	White Key B	964-044471-007
	White Key, High C	964-044471-008
	Black Key	964-044472-001
	Spring No. 7	975-044473-001
	Switch Unit No. 6	960-044474-001
	Switch Unit No. 7	960-044474-002
	Damper 9B	914-044475-001
	Damper 8B	914-044475-002
	Cabinet Assy., Without Overlays	997-045295-940
	Overlay, Display	913-045282-001
	Overlay, Left Hand Controller	913-045283-001
	Label, Rating, Domestic, 120V	913-045130-003
	Label, Rating, Export, 220V	913-045130-004
	Base Plate	967-045253-001
	Owner's Manual	993-045352-001
	Owner's Information Packet	997-045332-001
	Shipping Carton	932-042557-002
	Filler, Side, Foam	932-045345-001
	Insert Foam	932-045346-001
	P.C. Board Clip, Nylon	973-045326-001
	Membrane Switch Panel	960-045245-001

*Export Model Only

REF DESIG	DESCRIPTION	PART NO.
P21	9 Pin CIS Header, .1 Ctrs.	910-040299-009
P22	9 Pin CIS Header, .1 Ctrs.	910-040299-009
P23	7 Pin CIS Header, .1 Ctrs.	910-040299-007
P24	3 Pin CIS Header, .1 Ctrs.	910-040299-003
U1	IC, 7417 Hex Buffer	991-045305-001
U2	IC, 353 Dual Operational Amplifier	991-042908-001
U3	IC, 4051B CMOS 8 CH. Multiplex	991-041090-001
U4	IC, 4051B CMOS 8 CH. Multiplex	991-041090-001
U5	IC, 4051B CMOS 8 CH. Multiplex	991-041090-001
U6	IC, 353 Dual Operational Amplifier	991-042908-001
U7	IC, 353 Dual Operational Amplifier	991-042908-001
U8	IC, 353 Dual Operational Amplifier	991-042908-001
U9	IC, 353 Dual Operational Amplifier	991-042908-001
U10	IC, 353 Dual Operational Amplifier	991-042908-001
U11	IC, 353 Dual Operational Amplifier	991-042908-001
U12	IC, 353 Dual Operational Amplifier	991-042908-001
U13	IC, 353 Dual Operational Amplifier	991-042908-001
U14	IC, 353 Dual Operational Amplifier	991-042908-001
U15	IC, 358 Dual Operational Amplifier	991-041084-001
U16	IC, 353 Dual Operational Amplifier	991-042908-001
U17	IC, 3080A OTA	991-041089-004
U18	IC, 4016B CMOS Quad Switch	991-041087-001
U19	IC, 4007B CMOS Dual Complementary Pair	991-041086-001
U20	IC, 353 Dual Operational Amplifier	991-042908-001
U21	IC, 3290A Dual Comparator	991-043565-001
U22	IC, 7417 Hex Buffer	991-045305-001
U23	IC, 4016B CMOS Quad Switch	991-041087-001
U24	IC, 3080A OTA	991-041089-004
U25	IC, 4558 Dual Operational Amplifier	991-041146-001
U26	IC, 3046 Trans. Array	991-041104-002
U27	IC, 358 Dual Operational Amplifier	991-041084-001
U28	IC, 5837 Noise Generator	991-042016-001
U29	IC, 3080A OTA	991-041089-004
U30	IC, 353 Dual Operational Amplifier	991-042908-001
U31	IC, 3290A Dual Comparator	991-043565-001
U32	IC, 4016B CMOS Quad Switch	991-041087-001
U33	IC, 3080A OTA	991-041089-004
U34	IC, 3046 Trans. Array	991-041104-002
U35	IC, 358 Dual Operational Amplifier	991-041084-001
U36	IC, 4016B CMOS Quad Switch	991-041087-001
U37	IC, 3046 Trans. Array	991-041104-002
U38	IC, 3080A OTA	991-041089-004
U39	IC, 3080A OTA	991-041089-004
U40	IC, 4558 Dual Operational Amplifier	991-041146-001
U41	IC, 393 Dual Voltage Comparator	991-042388-001
U42	IC, 3080A OTA	991-041089-004
U43	IC, 353 Dual Operational Amplifier	991-042908-001
U44	IC, 3080A OTA	991-041089-004
U45	IC, 3080A OTA	991-041089-004
U46	IC, 4016B CMOS Quad Switch.	991-041087-001
U47	IC, 4007B CMOS Dual Complementary Pair	991-041086-001
U48	IC, 353 Dual Operational Amplifier	991-042908-001
U49	IC, 3080A OTA	991-041089-004
Q1	Transistor, NPN, 2N3904	991-041051-002
Q2	Transistor, PNP, 2N3906	991-041052-002
Q3	Transistor, NPN, 2N3904	991-041051-002
Q4	Transistor, PNP, 2N3906	991-041052-002
Q5	Transistor, PNP, 2N3906	991-041052-002
Q6	Transistor, NPN, 2N3904	991-041051-002
Q11	Transistor, PNP, 2N3906	991-041052-002
Q12	Transistor, PNP, 2N3906	991-041052-002
Q13	Transistor, NPN, 2N3904	991-041051-002
Q19	Transistor, PNP, 2N3906	991-041052-002
Q23	Transistor, FET, E402	991-041054-001
Q24	Transistor, NPN, 2N3392	991-042017-002
Q25	Transistor, NPN, 2N3392	991-042017-002
Q26	Transistor, NPN, 2N3392	991-042017-002
Q27	Transistor, NPN, 2N3392	991-042017-002
Q28	Transistor, NPN, 2N3392	991-042017-002
Q29	Transistor, NPN, 2N3392	991-042017-002
Q33	Transistor, NPN, 2N3904	991-041051-002
Q34	Transistor, PNP, 2N3906	991-041052-002
Q35	Transistor, NPN, 2N3904	991-041051-002
Q36	Transistor, PNP, 2N3906	991-041052-002
Q37	Transistor, PNP, 2N3906	991-041052-002
Q38	Transistor, NPN, 2N3904	991-041051-002
Q39	Transistor, PNP, 2N3906	991-041052-002
CR1	Diode, Signal, 1N4148	919-041075-001
CR2	Diode, Signal, 1N4148	919-041075-001
CR3	Diode, Signal, 1N4148	919-041075-001
CR4	Diode, Signal, 1N4148	919-041075-001

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RT NO. SERIES
52-312XXX-001
53-42XXXX-031

AND BOARD 6

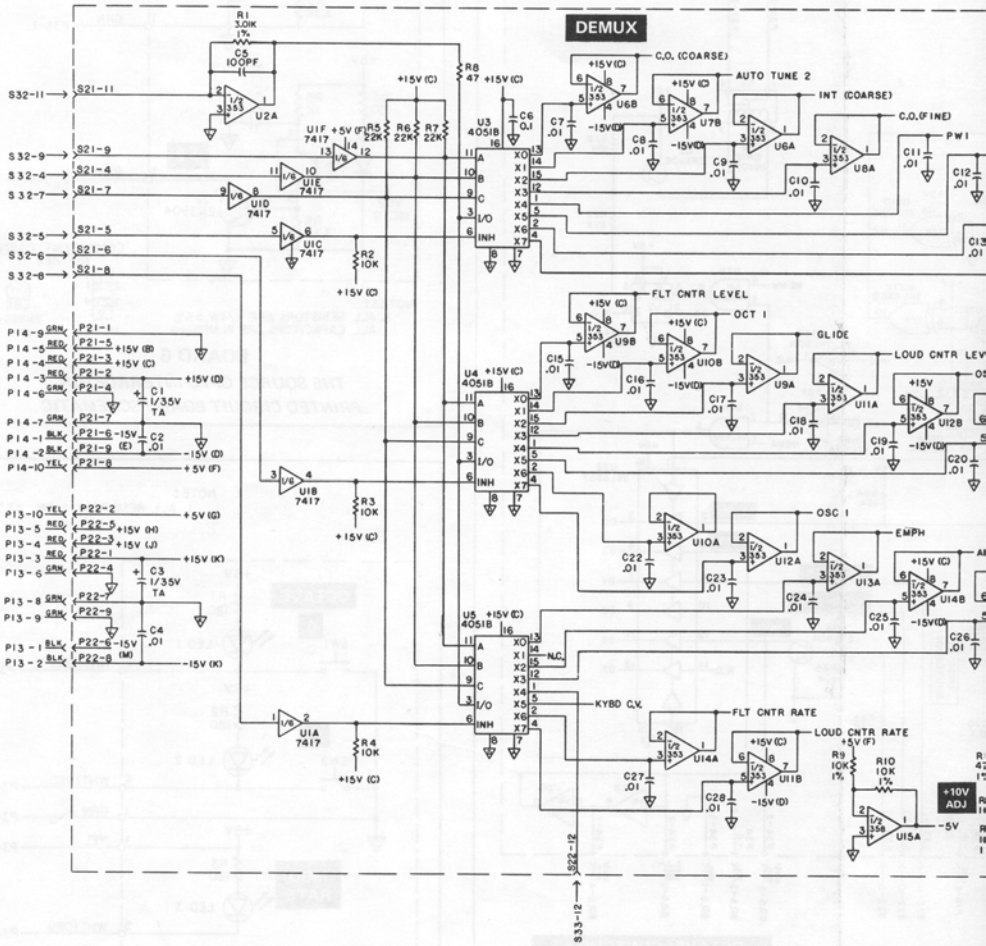
PART NO.
910-042392-005
939-041850-004
991-041097-001
939-042633-001
991-041097-001
939-045310-001
991-041097-001
939-045310-001
947-045011-103
925-045323-001
960-040223-016
960-040223-017
939-045311-001
991-041051-002

SYNTHESIZER PRINTED CIRCUIT BOARD 2 (Continued)

REF DESIG	DESCRIPTION	PART NO.
CR5	Diode, Signal, 1N4148	919-041075-001
CR6	Diode, Signal, 1N4148	919-041075-001
CR7	Diode, Signal, 1N4148	919-041075-001
CR8	Diode, Signal, 1N4148	919-041075-001
C1	Capacitor, Tantalum, 1 uf/35V	946-040231-009
C2	Capacitor, Tubular, .01 uf	947-045011-103
C3	Capacitor, Tantalum, 1 uf/35V	946-040231-009
C4	Capacitor, Tubular, .01 uf	947-045011-103
C5	Capacitor, Tubular, 100 pf	947-045008-101
C6	Capacitor, Monolithic, 0.1 uf	947-045183-104
C7	Capacitor, Polyester, .01 uf	946-041978-103
C8	Capacitor, Polyester, .01 uf	946-041978-103
C9	Capacitor, Polyester, .01 uf	946-041978-103
C10	Capacitor, Polyester, .01 uf	946-041978-103
C11	Capacitor, Polyester, .01 uf	946-041978-103
C12	Capacitor, Polyester, .01 uf	946-041978-103
C13	Capacitor, Polyester, .01 uf	946-041978-103
C14	Capacitor, Polyester, .01 uf	946-041978-103
C15	Capacitor, Polyester, .01 uf	946-041978-103
C16	Capacitor, Polyester, .01 uf	946-041978-103
C17	Capacitor, Polyester, .01 uf	946-041978-103
C18	Capacitor, Polyester, .01 uf	946-041978-103
C19	Capacitor, Polyester, .01 uf	946-041978-103
C20	Capacitor, Polyester, .01 uf	946-041978-103
C21	Capacitor, Monolithic, 0.1 uf	947-045183-104
C22	Capacitor, Polyester, .01 uf	946-041978-103
C23	Capacitor, Polyester, .01 uf	946-041978-103
C24	Capacitor, Polyester, .01 uf	946-041978-103
C25	Capacitor, Polyester, .01 uf	946-041978-103
C26	Capacitor, Polyester, .01 uf	946-041978-103
C27	Capacitor, Polyester, .01 uf	946-041978-103
C28	Capacitor, Polyester, .01 uf	946-041978-103
C29	Capacitor, Polyester, .01 uf	946-041978-103
C30	Capacitor, Polyester, .01 uf	946-041978-103
C31	Capacitor, Tubular, 100 pf	947-045008-101
C32	Capacitor, Polyester, .22 uf	946-041978-224
C33	Capacitor, Polyester, .001 uf	946-041978-102
C34	Capacitor, Tubular, 100 pf	947-045008-101
C35	Capacitor, Tubular, 470 pf	947-045008-471
C36	Capacitor, Tubular, .01 uf	947-045011-103
C37	Capacitor, Tubular, 47 pf	947-045008-470
C38	Capacitor, Tubular, 47 pf	947-045008-470
C39	Capacitor, Polyester, 0.1 uf	946-041978-104
C40	Capacitor, Polyester, .068 uf	946-041978-683
C41	Capacitor, Polyester, .015 uf	946-041978-153
C42	Capacitor, Polyester, .22 uf	946-041978-224
C43	Capacitor, Polyester, .0022 uf	946-041978-222
C44	Capacitor, Tubular, 100 pf	947-045008-101
C45	Capacitor, Tubular, 470 pf	947-045008-471
C46	Capacitor, Tubular, 47 pf	947-045008-470
C47	Capacitor, Tubular, 47 pf	947-045008-470
C48	Capacitor, Polyester, .47 uf	946-041978-474
C49	Capacitor, Aluminum Electrolytic, 220 uf/6.3V	945-044465-006
C50	Capacitor, Polyester, .01 uf	946-041978-103
C51	Capacitor, Polyester, .01 uf	946-041978-103
C52	Capacitor, Polyester, .01 uf	946-041978-103
C53	Capacitor, Polyester, .01 uf	946-041978-103
C54	Capacitor, Tubular, 470 pf	947-045008-471
C55	Capacitor, Aluminum Electrolytic, 10 uf/16V	945-044465-007
C56	Capacitor, Polyester, .047 uf	946-041978-473
C57	Capacitor, Polyester, .047 uf	946-041978-473
C58	Capacitor, Polyester, .33 uf	946-041978-334
C59	Capacitor, Monolithic, 0.1 uf	947-045183-104
R12, R39	Resistor, Trim Pot, Carbon, 10K	925-040275-004
R19	Resistor, Trim Pot, Carbon, 100K	925-040275-001
R70	Resistor, Trim Pot, Carbon, 5K	925-040275-003
R71	Resistor, Trim Pot, Cermet, 50K	925-042389-001
R72	Resistor, Trim Pot, Cermet, 500 ohm	925-042389-004
R78	Resistor, Trim Pot, Carbon, 100K	925-040275-001
R83	Resistor, Trim Pot, Carbon, 1K	925-040275-002
R100	Resistor, Trim Pot, Carbon, 10K	925-040275-004
R122	Resistor, Trim Pot, Cermet, 5K	925-042389-001
R123	Resistor, Trim Pot, Cermet, 500 ohm	925-042389-004
R127	Resistor, Trim Pot, Carbon, 100K	925-040275-001
R131	Resistor, Trim Pot, Carbon, 1K	925-040275-002
R146	Resistor, Trim Pot, Carbon, 100K	925-040275-001
R152	Resistor, Trim Pot, Carbon, 100K	925-040275-001
R155	Resistor, Trim Pot, Cermet, 500Ω	925-042389-004
R164	Resistor, Trim Pot, Carbon, 470Ω	925-040275-011
R167	Resistor, Trim Pot, Carbon, 10K	925-040275-004
R168	Resistor, Trim Pot, Carbon, 100Ω	925-040275-014
R179	Resistor, Trim Pot, Carbon, 100K	925-040275-001
R201	Resistor, Trim Pot, Carbon, 100K	925-040275-001
R205	Resistor, Trim Pot, Carbon, 100K	925-040275-001
R223	Resistor, Trim Pot, Carbon, 100K	925-040275-001

DIGITAL PRINTED CIRCUIT BOARD 3

REF DESIG	DESCRIPTION	PART NO.
P31	6 Position Flat Cable Connector	910-045148-006
P32	6 Position Flat Cable Connector	910-045148-006
P33	6 Position Flat Cable Connector	910-045148-006
P34	5 Pin CIS Header, .1 Ctrs.	910-040299-005
P35	4 Pin CIS Header, .1 Ctrs.	910-040299-004
P36	4 Pin CIS Header, .1 Ctrs.	910-040299-004
P37	7 Pin CIS Header, .1 Ctrs.	910-040299-007
P38	8 Pin CIS Right Angle Header, .1 Ctr., Keyed	910-042392-008
BT1	Battery, Lithium, 3V	926-045312-001
Y1	Crystal, Quartz, 4MHz	921-045313-001
K1	Relay, Reed, 500 Ohm Coil	921-045141-001
U1	IC, 74LS378, Hex D, Flip-Flop	991-043559-001
U2	IC, 7404, Hex Inverter	991-045304-001
U3	IC, 74LS378, Hex D, Flip-Flop	991-043559-001
U4	IC, 74LS378, Hex D, Flip-Flop	991-043559-001
U5	IC, 74LS378, Hex D, Flip-Flop	991-043559-001
U6	IC, 74LS04, Hex Inverter	991-042553-001
U7	IC, 74LS00, Quad NAND	991-043577-001
U8	IC, 4502B, CMOS Hex Inverter	991-043521-001
U9	IC, 4502B, CMOS Hex Inverter	991-043521-001
U10	IC, 78L05A, +5V Regulator	991-043687-001
U11	IC, 74LS378, Hex D, Flip-Flop	991-043559-001
U12	IC, 74LS378, Hex D, Flip-Flop	991-043559-001
U13	IC, 74LS155, Dual Decade	991-045301-001
U14	IC, 74LS393, Dual Binary Counter	991-043550-001
U15	IC, 74LS74, Dual D, Flip-Flop	991-045299-001
U16	IC, 74LS04, Hex Inverter	991-043553-001
U17	IC, 74LS00, Quad NAND	991-043577-001
U18	IC, 74LS125, Quad Tri Buffer	991-045300-001
U19	IC, 40106B, CMOS Hex Schmitt	991-043520-001
U20	IC, 4013B, CMOS Dual D, Flip-Flop	991-041110-001
U21	IC, 74LS386, Quad OR	991-045303-001
U22	IC, 74LS74, Dual D, Flip-Flop	991-045299-001
U23	IC, 2532 PROM	991-045307-001
U24	IC, Z-80 CPU	991-045306-001
U25	IC, 74LS02, Quad NOR	991-043552-001
U26	IC, 74LS138, Decoder	991-043555-001
U27	IC, 6514, RAM	991-045308-001
U28	IC, 6514, RAM	991-045308-001
U29	IC, AM6012PC, D/A Converter	991-045356-001
U30	IC, 4558, Dual Operational Amplifier	991-041146-001
U31	IC, 3290A, Dual Comparator	991-043565-001
U32	IC, 74LS367, Hex Buffer	991-045302-001
Q1	Transistor, NPN, 2N3904	991-041051-002
Q2	Transistor, PNP, 2N3906	991-041052-002
Q3	Transistor, NPN, 2N3904	991-041051-002
Q4	Transistor, NPN, 2N3904	991-041051-002
Q5	Transistor, NPN, 2N3904	991-041051-002
CR1	Diode, Signal, 1N4148	919-041075-001
CR2	Diode, Signal, 1N4148	919-041075-001
CR3	Diode, Signal, 1N4148	919-041075-001
CR4	Diode, Signal, 1N4148	919-041075-001
CR5	Diode, Signal, 1N4148	919-041075-001
CR6	Diode, Signal, 1N4148	919-041075-001
CR7	Diode, Rectifier, 1N4004	919-042019-001
CR8	Diode, Signal, 1N4148	919-041075-001
CR9	Diode, Signal, 1N4148	919-041075-001
CR10	Diode, Rectifier, 1N4004	919-042019-001
CR11	Diode, Signal, 1N4148	919-041075-001
CR12	Diode, Rectifier, 1N4004	919-042019-001
CR13	Diode, Signal, 1N4148	919-041075-001
CR14	Diode, Signal, 1N4148	919-041075-001
CR15	Diode, Signal, 1N4148	919-041075-001
CR16	Diode, Signal, 1N4148	919-041075-001
CR17	Diode, Signal, 1N4148	919-041075-001
CR18	Diode, Signal, 1N4148	919-041075-001
CR19	Diode, Signal, 1N4148	919-041075-001
C1	Capacitor, Monolithic, 0.1 uf	947-045183-104
C2	Capacitor, Polyester, .0015 uf	946-041978-152
C3	Capacitor, Tubular, .01 uf	947-045011-103
C4	Capacitor, Tubular, .01 uf	947-045011-103
C5	Capacitor, Aluminum Electrolytic, 47 uf/16V	945-044465-008
C6	Capacitor, Monolithic, 0.1 uf	947-045183-104
C7	Capacitor, Tubular, .01 uf	947-045011-103
C8	Capacitor, Tubular, .01 uf	947-045011-103
C9	Capacitor, Tubular, .01 uf	947-045011-103
C10	Capacitor, Tubular, .001 uf	947-045008-102
C11	Capacitor, Monolithic, 0.1 uf	947-045183-104
C12	Capacitor, Monolithic, 0.1 uf	947-045183-104
C13	Capacitor, Monolithic, 0.1 uf	947-045183-104
C14	Capacitor, Tubular, .01 uf	947-045011-103
C15	Capacitor, Polyester, .0027 uf	946-041978-272
C16	Capacitor, Tubular, 220 pf	947-045008-221
C17	Capacitor, Polyester, .0047 uf	946-041978-472
C18	Capacitor, Tubular, 100 pf	947-045008-101
C19	Capacitor, Monolithic, 0.1 uf	947-045183-104
C20	Capacitor, Monolithic, 0.1 uf	947-045183-104
C21	Capacitor, Tubular, .001 uf	947-045008-102
C22	Capacitor, Disc, 10 pf	947-042020-100
R60	Resistor, Trim Pot, Carbon, 100K	925-040275-001
R62	Resistor, Trim Pot, Cermet, 10K	925-042389-002
R72	Resistor, Trim Pot, Cermet, 500Ω	925-042389-004



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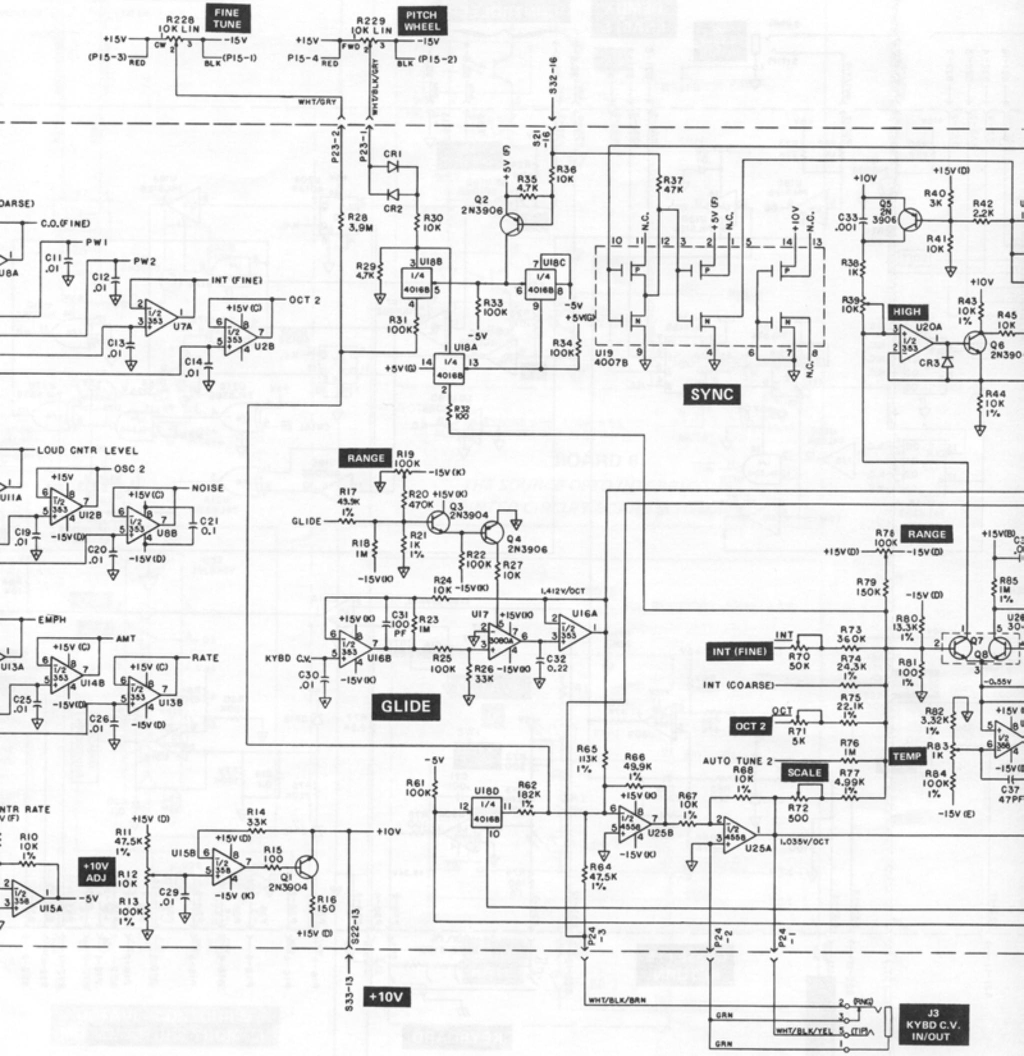
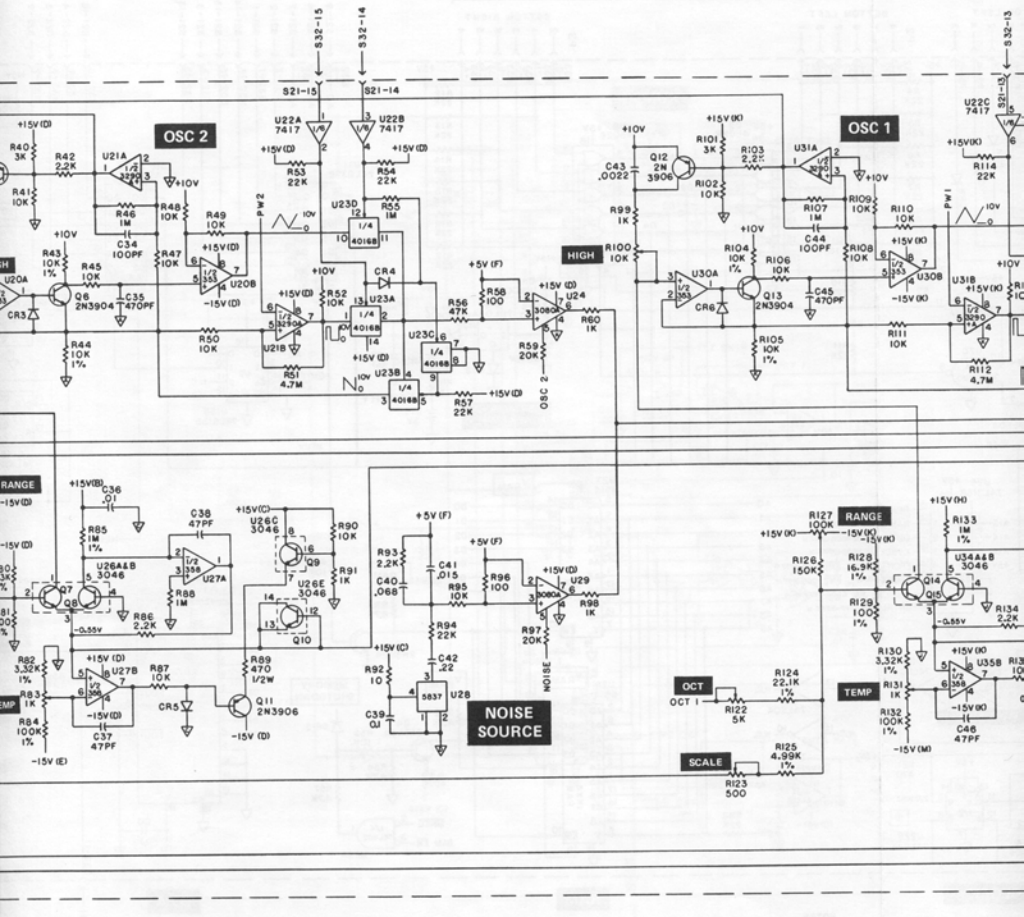

FINE TUNE
R228 10K LIN
+15V
-15V
(P15-3) RED
BLK (P15-1)
PITCH WHEEL
R229 10K LIN
P15-4 RED
BLK (P15-2)
WHT/GRY
WHT/BLK/GRY
S32-16
P23-2
P23-1
S21-16
CR1
CR2
R28 3.9M
R30 10K
R29 4.7K
U18B 1/4 4016B
R31 100K
R33 100K
Q2 2N3906
R35 4.7K
R36 10K
U18C 1/4 4016B
R34 100K
U18A 1/4 4016B
R32 100
R37 47K
U19 4007B
N.C.
SYNC
C.O. (FINE)
PW1
PW2
C11 .01
C12 .01
INT (FINE)
OCT 2
U7A
U2B
U8A
C13 .01
C14 .01
LOUD CNTR LEVEL
OSC 2
NOISE
U11A
U12B
U8B
C19 .01
C20 .01
C21 0.1
EMPH
AMT
RATE
U13A
U14B
U13B
C25 .01
C26 .01
RANGE
R19 100K
R17 43.9K 1%
GLIDE
R18 1M
R20 470K
R21 1K 1%
Q3 2N3904
Q4 2N3906
R22 100K
R27 10K
R24 10K
C31 100 PF
R23 1M
U17 3080A
1.412V/OCT
U16A
U16B
KYBD C.V.
C30 .01
R25 100K
R26 33K
C32 0.22
GLIDE
-5V
R61 100K
U18D 1/4 4016B
R62 182K 1%
R65 113K 1%
R66 49.9K 1%
R64 47.5K 1%
U25B
R67 10K 1%
R68 10K 1%
SCALE
R72 500
U25A
1.035V/OCT
R10 10K 1%
U15A
+10V ADJ
R11 47.5K 1%
R12 10K
R13 100K 1%
C29 .01
U15B
R14 33K
R15 100
Q1 2N3904
R16 150
+10V
S22-13
S33-13
+10V
P24-3
P24-2
P24-1
WHT/BLK/BRN
GRN
WHT/BLK/YEL
2 (RING)
5 (TIP)
J3 KYBD C.V. IN/OUT
+10V
+15V (D)
C33 .001
Q5 2N 3906
R40 3K
R42 2.2K
R41 10K
R38 1K
R39 10K
HIGH
U20A
R43 10K 1%
R45 10K
CR3
Q6 2N390
R44 10K 1%
RANGE
R78 100K
R79 150K
R85 1M 1%
R80 13.3K 1%
Q7
Q8
R81 100 1%
INT (FINE)
R70 50K
R73 360K
R74 24.3K 1%
INT (COARSE)
OCT 2
R71 5K
R75 22.1K 1%
R76 1M
AUTO TUNE 2
TEMP
R77 4.99K 1%
R82 3.32K 1%
R83 1K
R84 100K 1%
C37 47PF
-0.55V

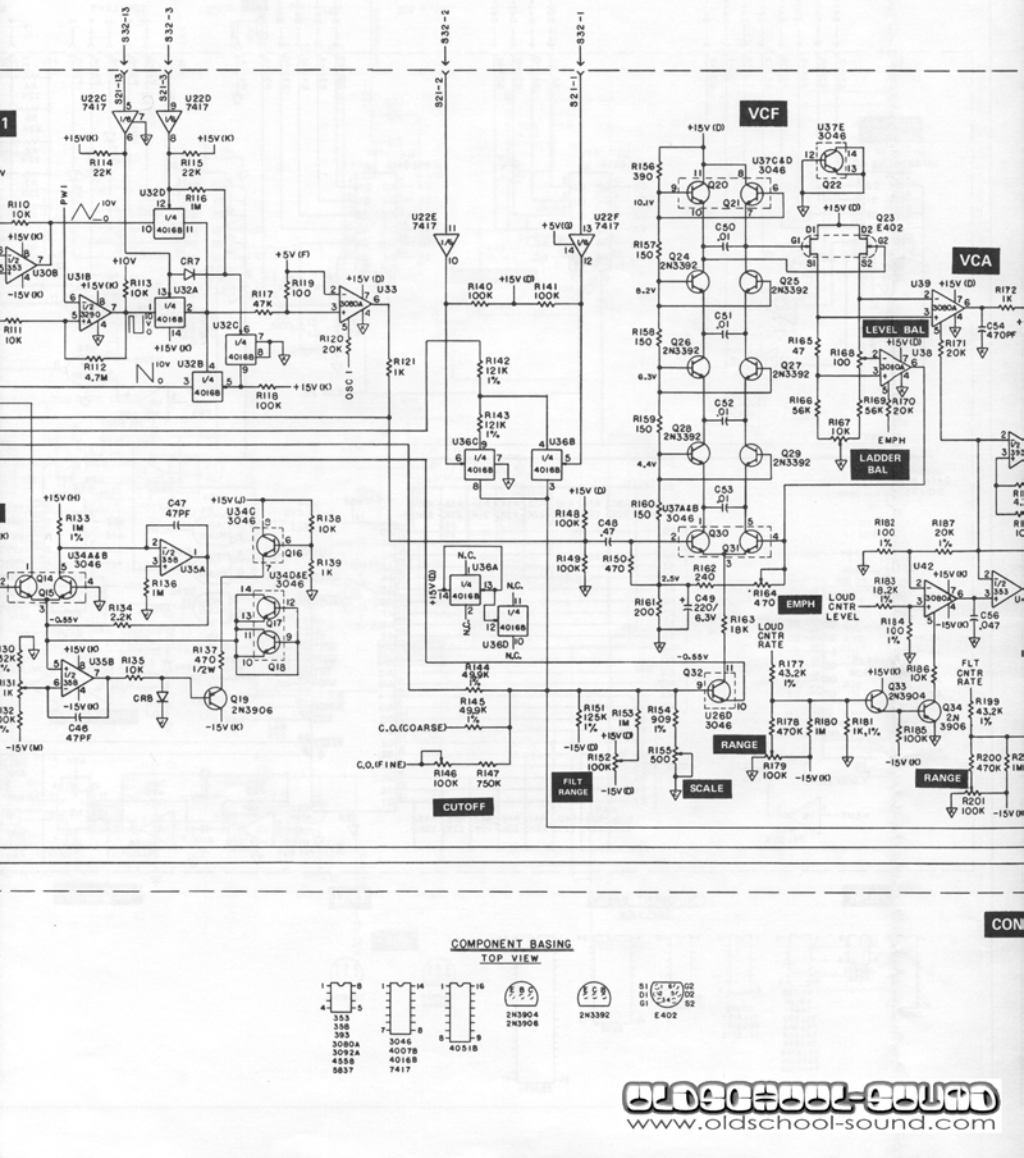


NOTES

1. UNLESS OTHERWISE SPECIFIED -
   ALL RESISTORS ARE IN OHMS 1/4W ±5%
   ALL CAPACITORS ARE IN MFD (mf)
   ALL DIODES ARE IN4148

ALL ⏚ ARE (DIGITAL GND)

ALL ⏚ ⏚ ⏚ ⏚ ⏚ ⏚ ARE (ANALOG GND)



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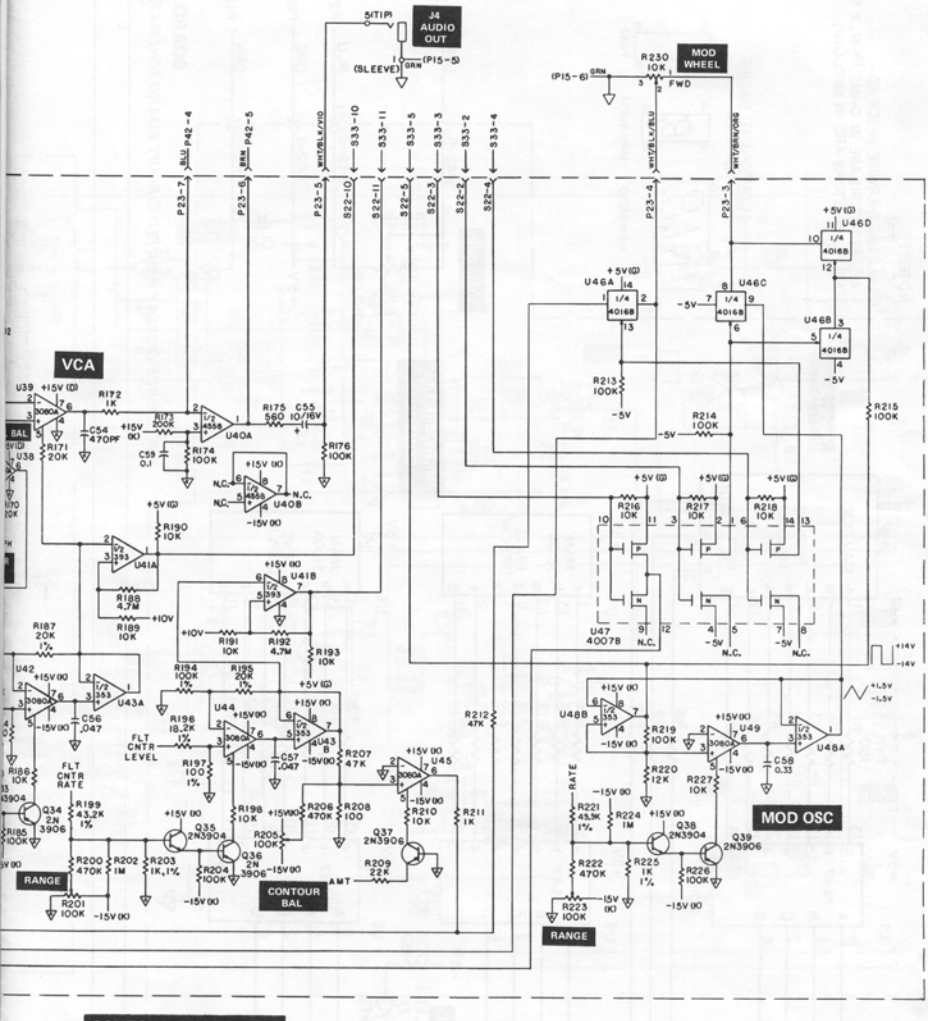

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BOARD 2

THE SOURCE SYNTHESIZER BOARD SCHEMATIC

Part Number: 997-045295-990
February 9, 1983
SOURCE ADDENDA - Software Revisions 3.2 and above

MUSIC INC.
2500 Walden Avenue
Buffalo, NY 14225 Phone (716) 681-7200

SEQUENCER TRANSPOSE

The sequencer may be transposed by the keyboard. The "zero" point - point of no transposition - is the first note of the sequence, transposed to the middle octave of the keyboard. For example:

- A sequence is recorded starting on low F♯.
- When this sequence is played back, F♯ in the middle octave is the zero point; playing this key will have no effect on the pitch of the sequence. Playing any other key will transpose the sequence.

Basing the transpose function in the middle octave allows any sequence to be transposed up or down, no matter where on the keyboard the original sequence was played. Note that this expands the instrument's range above and below the normal keyboard span.

Stopping the sequencer and restarting it with the CONTINUE function will retain the last transposition. Starting the sequencer with the PLAY function will cancel all transposition.

DRUM INTERFACE

Your SOURCE has several new rear panel connections not mentioned in the owner's manual. They are used to interface THE SOURCE with the various drum and rhythm units currently on the market.

The DIN connector (formerly used for cassette connections) is now used to connect to drum machines made by Roland and others who use these types of connectors. This connection allows the drum unit's CLOCK to also drive THE SOURCE's sequencers. The 12' DIN cable that connects THE SOURCE and the drum unit is available from the Moog Service Department. The TRIGGER IN jack connects to any output from a drum unit that puts out a trigger, ONLY on the downbeat. This trigger restarts the sequencer or steps the arpeggiator so the drumbeat and sequence will always be synchronized.

RECORDING A SEQUENCE FOR USE WITH A DRUM UNIT:

- Start the drum unit. This ensures that both instruments will be synchronized.
- Set THE SOURCE for sequencer record (as explained in the manual).
- On the downbeat, play the desired sequence.
  NOTE: Be sure to release the last note before this final downbeat. For best synchronization, hit STOP slightly after the downbeat.

PLAYING BACK A SEQUENCE IN SYNCHRONIZATION:

- On THE SOURCE, hit LEVEL 2, then SEQUENCE PLAY. With the drum interface connections in place, THE SOURCE will not play.
- At the desired time, start the playback of the drum unit. THE SOURCE will immediately begin playing the sequence in synchronization with the drum unit.

  NOTE: The trigger pulse provided by the drum unit automatically restarts the sequence. Make sure to hit STOP at the right time when recording the sequence or else the final note may be "chopped off" during playback when the sequence restarts.

CASSETTE INTERFACE

The cassette routine for storage and retrieval of digital program information has been improved to work with a greater variety of cassette recorders. The front panel controls function as explained in the owner's manual but the rear panel connections and display indicators have been updated.

The jack labeled FROM TAPE should be connected to the earphone or headphone output for best results, but a line level signal may also be used. The REMOTE jack should be used if the cassette recorder has a remote microphone on/off switching input. The TO TAPE jack should be connected to the aux or line input on the cassette recorder.

If you are using a stereo cassette recorder, be sure to only use one channel and make sure the inputs and outputs are connected to the same channel. The connectors used between THE SOURCE and a cassette recorder may be purchased locally from any electronics distributor.

When loading information from cassette, be sure the tape is wound back to the beginning of the "tone leader". If the tape is not wound enough, THE SOURCE may receive only a partial load. Note the tape counter settings carefully before starting any cassette operation.

SOUND CHARTS

The sound charts of the factory programs are approximate. Some controls, such as OSC 2 FREQUENCY and FILTER CUTOFF, have resolution higher than the incremental readout can display. Small differences from instrument to instrument may result in a setting that does not exactly match the manual.As long as the program sounds correct, it is not a problem.

ERRATA

Page 1 - Line 3 - Phrase should read "harmful static charges".

Page 22 - In the second paragraph of #3, change "blank leader" to "tone leader" with the display indicating "2o" instead of "CC". As data is being saved, the display will indicate a closed parenthesis "()" instead of "So".

- In the two lines after the #1, change "blank leader" to "tone leader".

Page 44 - All "eighth-notes" should be "sixteenth-notes".

Page 49-50 - The trigger cable diagrams should be reversed; on the older version instruments, the TRIG IN/OUT jack output signal appears at the ring, and the input connection is at the tip. Note that later versions split the shorting trigger (S-Trig) into both an S-TRIG INPUT and S-TRIG OUTPUT.

Page 49 - First sentence - delete "and filter".

MANUFACTURER and MODEL	IN/OUT CONFIGURATION		MOOG MODEL & S/N	IN/OUT CONFIGURATION		SPECIAL NOTES 06:17:83
ROLAND DR. RHYTHM	CLOCK	OUT-1/8" MINIJACK	SOURCE>3180	SYNC IN	5 PIN DIN JACK	Rewire Taurus cable 957-045453-001.
	ACCENT	OUT-1/8" MINIJACK	SOURCE>3180	TRIGGER IN	1/4" PHONE JACK	Buy or fabricate locally.
ROLAND CR-6000 COMPURHYTHM	CLOCK	OUT-AVAILABLE INSIDE	SOURCE>3180	SYNC IN	5 PIN DIN JACK	Rewire Taurus cable 957-045453-001.
	STEP	OUT-1/4" PHONE JACK	SOURCE>3180	TRIGGER IN	1/4" PHONE JACK	Use standard cable.
ROLAND DRUMATIX TR-606	CLOCK/SYNC	OUT-5 PIN DIN JACK	SOURCE>3180	SYNC IN	5 PIN DIN JACK	Use Taurus cable 957-045453-001.
	TRIGGER	OUT-(2)1/8" MINIJACKS	SOURCE>3180	TRIGGER IN	1/4" PHONE JACK	Buy or fabricate locally.
ROLAND TR-808	CLOCK/SYNC	OUT-5 PIN DIN JACK	SOURCE>3180	SYNC IN	5 PIN DIN JACK	Use Taurus cable 957-045453-001.
	TRIGGER	OUT-1/4" PHONE JACK	SOURCE>3180	TRIGGER IN	1/4" PHONE JACK	Use standard guitar cable.
KORG KPR-77	CLOCK/SYNC	OUT-5 PIN DIN JACK	SOURCE>3180	SYNC IN	5 PIN DIN JACK	Requires DIN rewiring.
	TRIGGER	OUT-1/4" PHONE JACK	SOURCE>3285X	TRIGGER IN	1/4" PHONE JACK	Use standard guitar cable.
E-MU SYSTEMS INC. DRUMULATOR	CLOCK	OUT-RCA PIN"PHONO" JACK	SOURCE>3180	SYNC IN	5 PIN DIN JACK	No direct interface.
	TRIGGER	OUT-RCA PIN"PHONE" JACK	SOURCE>3285X	TRIGGER IN	1/4" PHONE JACK	needs "pulsed" clock signal.
	WILL WORK WITH DR. CLICK					
LINN ELECTRONICS LINNDRUM	SYNC	OUT-1/4" PHONE JACK	SOURCE>3180	SYNC IN	5 PIN JACK	No direct interface.
	TRIGGER	OUT-1/4" PHONE JACK	SOURCE>3285X	TRIGGER IN	1/4" PHONE JACK	needs "pulsed" clock signal.
GARFIELD ELECTRONICS DR. CLICK	SYNC	OUT-5 PIN DIN JACK	SOURCE>3180	SYNC IN	5 PIN DIN JACK	Use Taurus cable 957-045453-001.
	STEP(?)	OUT-1/4" PHONE JACK	SOURCE>3285X	TRIGGER IN	1/4" PHONE JACK	Use standard guitar cable.
OBERHEIM DMX	---- USE DR. CLICK ----		SOURCE>3180	SYNC IN	5 PIN DIN JACK	No direct interface.
			SOURCE>3285X	TRIGGER IN	1/4" PHONE JACK	needs "pulsed" clock signal.
???FUTURE???			SOURCE>3285X	TRIGGER IN	1/4" PHONE JACK	needs "pulsed" clock signal.
ANY MANUFACTURER'S SEQUENCERS	VARIOUS		SOURCE ALL	"Will not interface due to software generated trigger in Source."		
	VARIOUS		SOURCE ALL			
MOOG TAURUS II "CONTROLLER"	C/V OUT	1/4" PHONE JACK	SOURCE ALL	KB-CV IN/OUT	1/4" STEREO JACK	"TIP" to "RING" cable 957-046077-901
	S-TRIGGER	1/4" PHONE JACK	SOURCE ANY	S-TRIG IN	1/4" VARIOUS JACKS	Use standard guitar cable. Pitch output is additive and drifts slightly during "source only" usage. Add DPDT External Synthesizer switch to Taurus. See Interface Note #1.
MOOG TAURUS II "SYNTHESIZER"	KYBD IN/OUT	1/4" STEREO JACK	SOURCE ALL	KB-CV IN/OUT	1/4" STEREO JACK	"TIP" to "RING" cable w/1K pot.
	TRIG IN/OUT	1/4" STEREO JACK	SOURCE ANY	S-TRIG IN	1/4" VARIOUS JACKS	Use standard guitar cable. Connection requires pitch. See Interface Note #2.
OTHER MANUFACTURER'S SYNTHESIZERS	PITCH OUT	VARIOUS JACKS	SOURCE ALL	KB-CV IN/OUT	1/4" STEREO JACK	"TIP" to "RING" w/1K pot.
	GATE OUT	VARIOUS JACKS	SOURCE ANY	S-TRIG IN	Unusable jack.	Add circuitry for GATE (V-TRIG). Rescale pitch. Interface Notes #2 and #3.

SOURCE DRUM INTERFACE UPDATE BULLETIN #1741

DIGITAL BOARD MODIFICATIONS

DELETE	ADD	PART NUMBER	COMMENTS
R2 470 OHM	R2 1K OHM	852-317102-001	Update schematic
C1 .1 uf	C1 .01 uf	947-045183-103	Update schematic
Jumper at the C2 location.	Step 1 - mount and solder C2, a 2.2 uf/25V capacitor with negative side towards P37-3. Step 2 - Mount a 100K, R89 from right side of R2 to negative side of C2.	945-040209-014 852-312104-001	Update schematic by showing R89 from ground to the negative side of C2.
R3 22K	Deletion only	Not applicable	Update schematic.
R63 100 Ohm	R63 10K	852-312103-001	Update schematic
C15 .01uf	C15 .1uf	946-041978-104	Update schematic
R65 22K	R65 Add 100K from top of old R65 location to the bottom of CR16 location (CR16 location is not used).	852-312104-001	Update schematic by showing R65 from +5V to U30 Pin 5.
R68 47K Ohm	R68 100K Ohm	852-312104-001	Update schematic
R67 750K Ohm	R67 100K Ohm	852-312104-001	Update schematic
R66 47K Ohm	R66 100K Ohm	852-312104-001	Update schematic
R69 4.7M Ohm	R69 2M Ohm	852-312205-001	Update schematic
C16 220pf	C16 470pf	947-045008-471	Update schematic
Not applicable	Insulated white wire jumper from the top of R66 to bottom of the old R65 location.	987-040751-999	Update schematic by shorting R64 to pin 6 of U30.
Not applicable	CR20 and CR21- Add two 1N4748A diodes at P37 Pins 1 and 2.	919-041255-002	Solder two 22 volt 1 watt 5% zener diodes to the traces coming from Pins 1 and 2 of P37 and join cathodes together.
EPROM U23 Old version	EPROM U23 Version 3.2	991-045307-910	Return old EPROM version to Moog for recycling. Be sure to return it in black black velostat foam provided.
K1 .5 amp closure rating	K1 1 amp closure rating	921-045141-002	Replace old relay with one of larger current rating.

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DIGITAL BOARD WIRING

S71 (7 PIN Connector)	Digital Board
Pin 1 (brown)	On trace running from U12 pin 14 to U11 pin 14.
Pin 2 (yellow)	Top side of C8 the .01uf
Pin 3 (white)	On pin 11 of U13
Pin 4 (blue)	On trace running from U12 pin 4 to U11 pin 4
Pin 6 (orange)	On trace running from U12 pin 6 to U11 pin 6
Pin 7 (green)	Bottom of C8 the .01uf

TRIGGER-IN JACK BOARD ASSEMBLY

DESIGNATOR	PART NUMBER	DESCRIPTION
Not applicable	980-046071-001	Printed circuit board
P71	910-040299-007	Header CIS 7 pin 0.1 ctrs.
Not applicable	906-045188-016	16 Pin IC socket
J2	910-045552-003	Jack 1/4" Phone (RN113B)
U1	991-043521-001	IC4502B CMOS Hex Buffer
C1, C2, C4	947-045183-103	Capacitor .01 MFD Ceramic
C3	947-045008-471	Capacitor 470 PFD Ceramic
R1, R3, R5	852-312104-001	Resistor 100K 1/4W +/-5%
R2, R4, R6	852-312474-001	Resistor 470K 1/4W +/-5%

JACK WIRING

JACK	FROM
DIN Pin 1	Blue wire from jack board
DIN Pin 2	Green wire from jack board
DIN Pin 3	Brown wire from jack board
NEW JACKS	
S-trig out (hot)	White/yellow wire shorten to 9" from S37 Pin 6
S-trig in (hot)	White/violet wire shorten to 9" from S37 Pin 7
S-trig in (gnd)	Green wire from S15 Pin 7
S-trig out (gnd)	Bare wire 1.5" long to S-trig In (gnd)
To tape (hot)	Black wire shorten to 8" from S37 Pin 3
To tape (gnd)	Shield wire shorten to 8" from S37 Pin 4
From tape (hot)	White/blue wire shorten to 8" from S37 Pin 5
From tape (gnd)	Green wire 2" long to tape (gnd)
Remote (plastic thread) (hot)	White/black/red wire shorten to 8" from S37 Pin 1; add 4.7 ohm resistor, part number 852-512047-001 in series with this wire and cover with heat shrink tubing.
Remote (plastic thread) (gnd)	White/black/orange wire shorten to 8" from S37 Pin 7. Tie wrap where necessary

SYNTHESIZER BOARD MODIFICATIONS

DELETE	ADD	PART NUMBER	COMMENTS
R225 1K Ohm 1%	R225 909 Ohm 1%	853-429090-031	Adjust R223 to 250 Hz maximum and update schematic and test procedures accordingly
R224 1MEG	Deletion only	"As required"	Delete this resistor only if unable to adjust R223 to the 250Hz requirement above.

SOURCE SOFTWARE AND ACCESSORIES
Moog Music Inc.
2500 Walden Avenue
Buffalo, NY 14225

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DESCRIPTION	PART NUMBER	$ EACH	TOTAL
Cassette of factory programs	935-044665-001	$10.00	
Cassette of programs by Jan Hammer featuring FEEDBACK, STEEL DRUM, SYNC and many bass programs.	935-044665-002	$10.00	
Cassette of DEVO programs by Mark Mothersbaugh from his latest album cuts.	935-044665-003	$10.00	
Cassette of programs by Gary Wright from his ENDANGERED SPECIES, LIGHT OF SMILES, DREAM WEAVER and WRIGHTS PLACE albums.	935-044665-004	$10.00	
"DIN" CABLE, 12', double ended, for use with rhythm unit interfacing.	957-045453-001	$15.00	
"DIN" CABLE, 6', terminated with two 1/4" phone plugs for use with rhythm unit interfacing for SYNC and START/STOP.	957-045453-002	$15.00	
"CV INPUT" cable 10' 1/4" stereo to 1/4" mono (ring to ground connection). NOTE: "CV OUTPUT" can be accomplished with a standard mono guitar cable.	957-046077-901	$10.00	
TAPE RECORDER cable and other general purpose uses. Molded 1/4" phone to RCA (phono) plug - 6' long.	957-043396-001	$10.00	
GENERAL INTERFACING cable. 1/4" phone to 1/8" (3.5mm) miniature plug.	957-043396-002	$10.00	
POWER CORD, detachable 120V U.S.A.	957-041794-001	$ 8.00	
POWER CORD, detachable 220V EUROPE	957-043400-001	$ 9.00	
PAINTER'S CAP - White cotton with plastic white bill and 1-1/2" black MOOG logo. Adjustable back strap - one size fits all.	935-044681-001	$ 5.00	
SOURCE T-SHIRT - 50% cotton/polyester, full cut with set-in sleeves and ribbed neck. Light blue with a screened SOURCE superimposed on an expanding grid pattern with lettering "MAY THE SOURCE BE WITH YOU".	Small 935-043322-961	$ 6.00	
	Medium 935-043322-962	$ 6.00	
	Large 935-043322-963	$ 6.00	
	X-Large 935-044322-964	$ 6.00	
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	N.Y. Residents add 7% Tax		
	Shipping and handling		$ 3.00
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