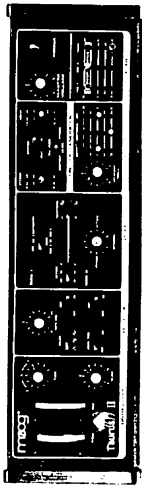
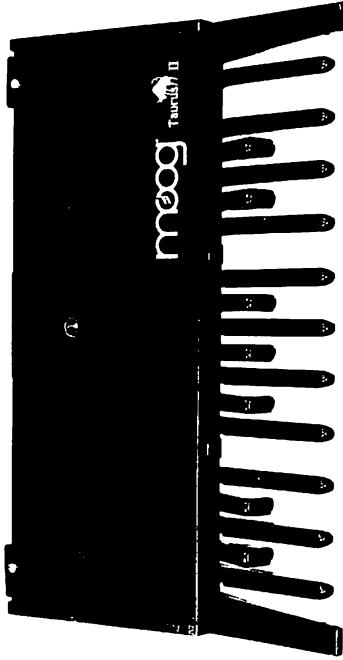


TECHNICAL SERVICE INFORMATION for



MODEL 343 A



MODEL 343 B

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.
2500 Walden Avenue, Buffalo, New York 14225
MOOG MUSIC
p/a Waalhaven Zuid Zijde 48, 3088 HJ, Rotterdam, The Netherlands

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SPECIFICATIONS

NOTE

All specifications are typical and may vary slightly from unit to unit.

POWER REQUIREMENTS

Operating Voltage Input to Instrument
24 volts AC nominal, 28 volts AC maximum; 50-60 Hertz
Power Consumption
6 watts

CONTROLLERS

Keyboard
18 note (C to F)
GLIDE control
Linear, continuously variable from 5 msec to 2.3 sec

TUNE CONTROL

Modulation Rate
Control
+/- 3 semitones
.3Hz to 31Hz

MODULATION RATE

Control
Triangle, Square or Sample and Hold

MODULATION SHAPE

Switch
Zero to 18 semitones

OSC MODULATION AMOUNT

Control
Zero to 4 octaves

PITCH WHEEL RANGE

Amount
+/- 7 semitones

OSCILLATORS

Reference frequency for Low F (Octave = 32')

OSC 1

32.7 Hz

OSC 2

32.7 Hz

WAVEFORMS

OSC 1
Sawtooth and 50% duty cycle; Square wave

OSC 2
Sawtooth and 85% duty cycle; Pulse wave

OCTAVES

OSC 1 and OSC 2
32', 16', 8'

SYNC OSC 2 TO OSC 1
Locks the fundamental frequency of OSC 2 to OSC 1;

OSC 1, ON
INTERVAL control sweeps OSC 2 four octaves

SYNC OSC 2 TO OSC 1, CONTOURED
Locks the fundamental frequency of OSC 2 to OSC 1; Contour envelope sweeps OSC 2 through the CONTOUR AMT Control (four octaves)

OSC 2 INTERVAL Control
16 semitones

CONTOUR GENERATOR

ATTACK Time
Minimum
4 milliseconds

Maximum
6 seconds

DECAY Time

Minimum
10 milliseconds

Maximum
20 seconds

Sustain Level at U12B with
Key depressed and SUSTAIN Switch IN
4.8 volts

VOLTAGE CONTROLLED FILTER (VCF)

Type: Patented 24dB/octave low pass filter

KEYBOARD TRACKING
Zero to 100% of keyboard control voltage effects the filter cutoff

Regeneration Frequency with
FILTER CUTOFF Control
740Hz

centered, KEYBOARD TRACKING min.,
CONTOUR AMT min.,
Range of FILTER CUTOFF
Control
11 octaves

FILTER CONTOUR AMT Range
6.3 octaves

VOLTAGE CONTROLLED AMPLIFIER (VCA)

(All outputs measured at AUDIO OUT)

OSC 1 Sawtooth
-2dB

OSC 2 Sawtooth
-2dB

NOISE
+6dB

REAR PANEL I/O

KEYBOARD IN
1 volt per octave

KEYBOARD OUT
1 volt per octave

S-TRIGGER IN
Short to ground triggers CONTOUR GENERATOR

S-TRIGGER OUT
Shorts J2 pin 5 to ground when key is depressed

V-TRIGGER IN
+3 to 10 volt gate triggers CONTOUR GENERATOR

V-TRIGGER OUT
+10 volts when key is depressed

AUDIO IN
Signal is processed by VCF and VCA; 18K input impedance

SIGNAL TO NOISE RATIO

Bleedthrough (all levels down,
MASTER VOL max)
50dB

WEIGHTS AND DIMENSIONS

Synthesizer Dimensions
21" wide x 6-3/4" deep x 4-3/8" high
(53cm x 17cm x 11cm)

Synthesizer Weight
7 pounds (3.2kg)

NOTE

All adjustments may be accomplished **WITHOUT** disassembly and are accessible through the rear panel holes using a 1/8-inch (3mm) screw driver. **DO NOT** use excessive force when inserting screw driver or damage to trim pot may result.

DISASSEMBLY PROCEDURE

NOTE

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

SYNTHESIZER UNIT REMOVING BASE

Base removal is accomplished by removing seven (7) self tapping screws on the bottom of the unit.

REMOVING CONTROL BOARD 1 AND POWER SUPPLY BOARD 2

Remove all rotary and slide pot knobs. Remove the four (4) 3/8 nuts and finishing washers from the phone jacks on the rear panel. Release Board 2 from the rear panel. Remove the three (3) screws securing the front of Board 1 to the housing. Remove the three (3) screws from the rear panel which secure the printed circuit board guide.

Remove P.C. Boards 1 and 2 together. Disconnect keyboard and left hand control connectors. Reconnect prior to reassembly of P.C. Boards into housing.

NOTE

During assembly, the switch levers must be placed in a mechanically centered position to clear the front panel mounting holes. This center position may be unrelated to the actual switch operating positions. Board 1 and Board 2 are hard wired together; avoid excessive flexing of wire solder connections.

BASS PEDAL UNIT BOTTOM COVER REMOVAL

Removal of bottom cover is accomplished by removing eight (8) No. 6 self tapping screws (4 on bottom, 2 each on front and rear). This allows access to pedal suspension components and pedal switch actuator adjustment tabs.

TOP ENCLOSURE REMOVAL

Removal of top enclosure is accomplished by removing thirteen (13) No. 8 self tapping screws (4 from top rear stand mount, 4 from bottom across front and 5 from rear of unit). Tilt enclosure back on to rear panel to expose (3) keyboard switch P.C. Boards, switch actuators and contacts.

PEDAL REMOVAL

Pedal Cap removal is accomplished by removing one (1) No. 8 sheet metal screw at top rear and one (1) machine screw together with the rubber foot under front of pedal. Pedal channel is removed by removing two (2) 1/4-20 shoulder bolts, two (2) white felt pivot washers at front, one (1) white and one (1) red felt guide washer at rear and compression spring.

SWITCH P.C. BOARD REMOVAL

Each switch P.C. Board is retained by two (2) No. 8 screws. Carefully unlock 4 position connector and slide P.C. Board assembly to side for removal. Removal of center P.C. Board requires removal of either left or right P.C. Board. Take care not to damage switch contact springs. Ensure contact springs are properly positioned relative to the plastic actuator on the pedal channel upon reassembly.

SWITCH CONTACT ADJUSTMENT

Adjustment of switch actuator position is accomplished by bending tab located at rear of pedal channel. Insert a flat blade screwdriver into slot provided in tab to adjust height of actuator.

Switch contact springs are located just above the pedal channel with one spring positioned inside the slot in the plastic actuator and the other directly above the actuator. Repair of a single switch can be made by removing two (2) pedal suspension bolts and pedal channel. For more extensive repair, remove top enclosure for access to switch P.C. Boards, spring contacts and actuators.

ALIGNMENT PROCEDURE

NOTE

Synthesizer alignment procedure must be performed with intended bass pedal keyboard as a matched set.

All trim adjustments can be made without opening the unit. This is done by using the trimpot access holes, the KEYBOARD IN/OUT jack and the AUDIO OUT jack which are located on the back of the unit. Allow unit to warm up for about 15 minutes before making these adjustments.

KEYBOARD SCALE ADJUSTMENT

Set GLIDE control R13 at minimum. Use DVM to monitor voltage at the tip of the KEYBOARD IN/OUT jack J1.

Alternately depress low F and high C keys. Adjust "Keyboard Scale Trim" R24 for a 1.41 VDC difference to achieve a 1 volt/octave scale factor.

OSCILLATOR 1 SCALE, FREQUENCY AND HI END ADJUSTMENTS

Set the following controls:
MASTER VOLUME, R148
OSC 1 LEVEL, R116
Maximum
Maximum

OSC 2 & NOISE LEVEL, R118 & R120

FILTER CUTOFF, R68 Minimum
FILTER EMPHASIS, R129 Maximum
FILTER CONTOUR AMT, R66 Minimum
VCA MODE, SW9 Minimum
OSC SYNC, SW6 Bypass
OCTAVE, SW4 Off
OSC WAVEFORM, SW7 3Z[†] Sawtooth
OSC 2 INTERVAL, R86 Unison
OSC, VCF MODE, SW2, SW5 Off
TUNE, R16 Centered
PITCH WHEEL, R160 Centered

Center the following trim pots:

"Range 1 Trim" R58
"Scale 1 Trim" R54
"Osc 1 Hi-End Trim" R97

Monitor the audio output frequency at the AUDIO OUT jack J5.

Depress and hold low C. Using "Range 1 Trim" R58, adjust OSC 1 for 32Hz.

Depress and hold high C. Using "Scale 1 Trim" R54, adjust OSC 1 for 65Hz.

Repeat two previous steps until a perfect one octave spread is obtained.

Change OCTAVE switch SW4 to 8[†].

Depress and hold low C. Adjust "Octave Trim" R155 for 65Hz.

Depress high C and adjust "Hi-End Trim" R97 for 130Hz.

Repeat two previous steps until a perfect one octave spread is obtained.

Repeat above steps as required until tuning is satisfactory on all ranges.

OSCILLATOR 2 SCALE, FREQUENCY AND HI END ADJUSTMENTS

Set the controls as in OSC 1 tune up procedure except as indicated below:

OSC 2 LEVEL, R118 Minimum
OSC 2 LEVEL, R118 Maximum

VCA R139 OSC 2 HI END R72
OSC 2 HI END R72

RNG 2 R51 SCL 1 R54 R55 R58 RING 1 R48 R58

KBD SCL R24

OSC 1 HI END R97

J5 J1

Center the following trim pots:

"Range 2 Trim" R51
"Scale 2 Trim" R48
"Osc 2 Hi-End Trim" R72

Monitor the audio output at the AUDIO OUT jack, J5. Depress and hold low C. Using "Range 2 Trim" R51, adjust OSC 2 for 32Hz.

Depress and hold high C. Using "Scale 2 Trim" R48, adjust OSC 2 for 65Hz.

Repeat two previous steps until a perfect one octave spread is obtained.

Change OCTAVE switch SW4 to 8[†].

Depress and hold low C and adjust "Range 2 Trim" R51 for 65Hz.

Depress and hold high C and adjust "Osc 2 Hi-End Trim" R72 for 130Hz.

Repeat two previous steps until a perfect one octave spread is obtained.

Repeat above steps as required until tuning is satisfactory on all ranges.

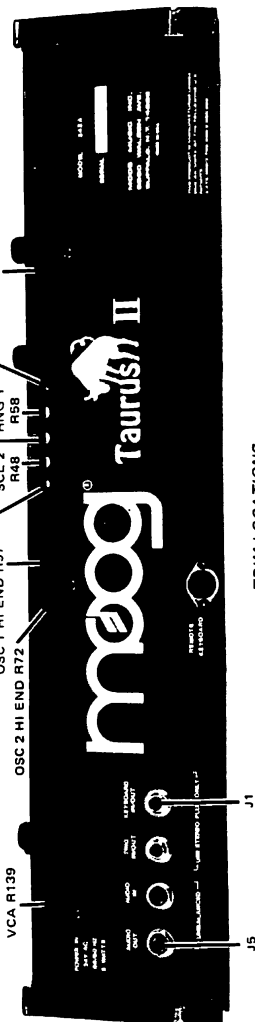
VCA BALANCE ADJUSTMENTS

Set the following controls:

MASTER VOLUME, R148 Maximum
OSC 1 LEVEL, R116 Minimum
OSC 2 LEVEL, R118 Minimum
NOISE LEVEL, R120 Minimum
VCA MODE, SW9 Keyed
FILTER CUTOFF, R68 Maximum
FILTER EMPHASIS, R129 Minimum
FILTER CONTOUR AMT, R66 Minimum
MODULATION RATE, R43 30
AUTO TRIG, SW1 On

Monitor at the AUDIO OUT jack J5.

Adjust "VCA Trim" R139 for minimum output level.



TRIM LOCATIONS

MECHANICAL REPLACEMENT PARTS LIST

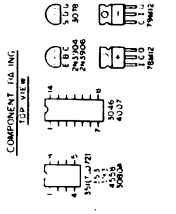
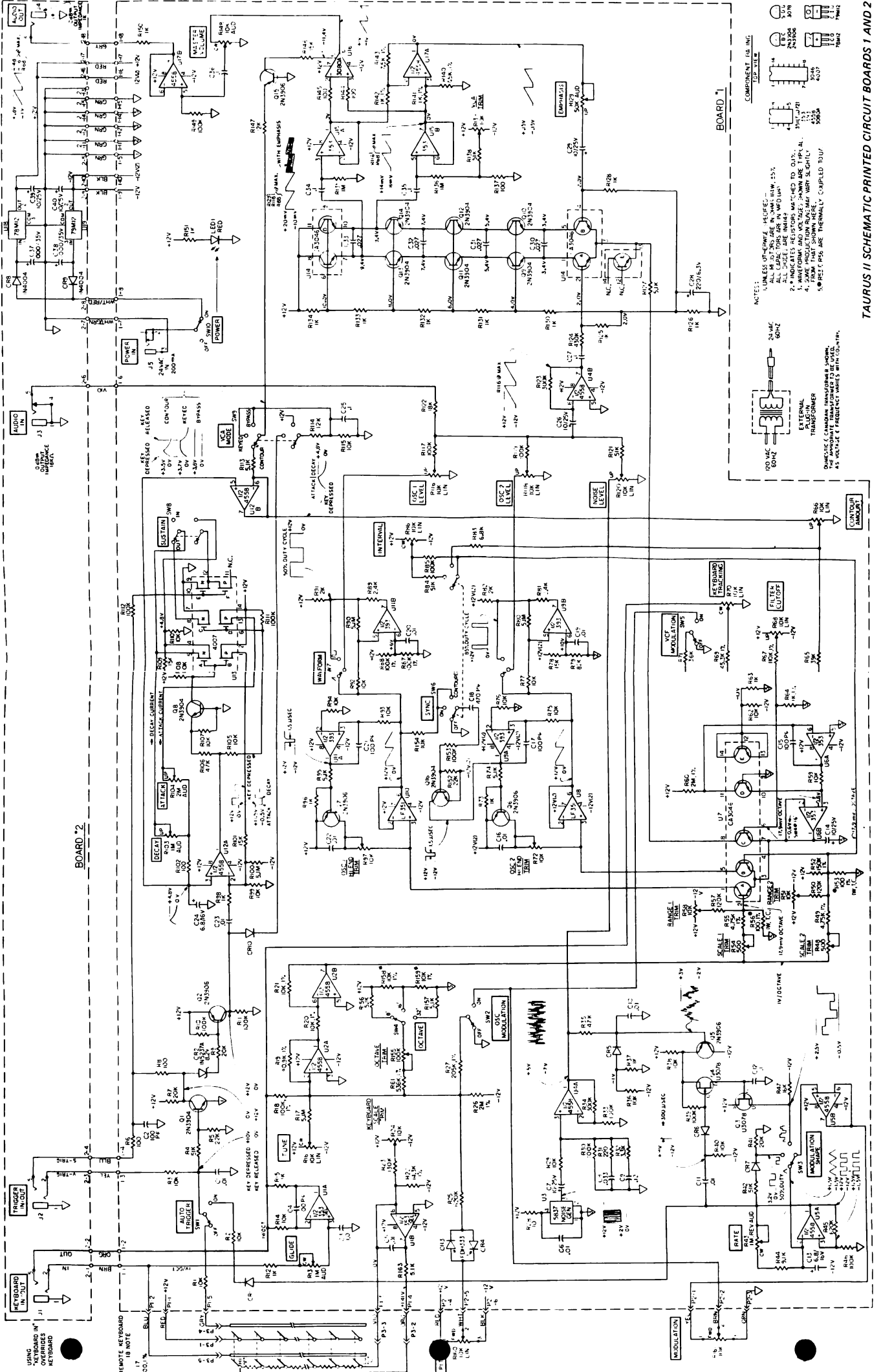
REF DESIG	DESCRIPTION	PART NO.
	P.C. Board Assembly, Synth.	996-045367-002
	P.C. Board Assembly, Keyboard, Left	996-045431-001
	P.C. Board Assembly, Keyboard, Center	996-045431-002
	P.C. Board Assembly, Keyboard, Right	996-045431-003
	Base Pedal Keyboard Assembly	979-045445-001
	Pedal Cap, Black	915-003863-000
	Pedal Cap, Brown	915-003866-000
	Actuator, Switch	964-030990-000
	Contact, Spring	917-030494-000
	Buss Bar Assembly	997-032370-000
	Bolt, Shoulder, Front	903-027479-000
	Bolt, Shoulder, Rear	903-027482-000
	Washer, Pivot	904-005076-000
	Washer, Guide	904-025503-000
	Spring, Compression	975-027479-000
	Stand Assembly (MSC)	935-045620-001
	Flange, Stand, 5/8-27 (AD-11)	962-045428-001
S1	Connector, CIS, Socket Housing, 5 Pin	906-040298-005
S2	Connector, CIS, Socket Housing, 6 Pin	906-040298-006
S3	Connector, DIN, 5 Pin	910-045322-005
	Seal, Foam, Front Panel, Left	914-045372-001
	Seal, Foam, Front Panel, Right	914-045373-001
	Grommet, Power Plug	977-045386-001
	Wheel Assembly	997-041597-001
	Detent, Spring	961-041178-001
	Detent, Teflon	962-041179-001
	Knob, Slide Pot, Assembly, Blue Insert	915-040272-951
	Knob Assembly, Skirted, Clear Spun Aluminum	915-042764-943
R161	Resistor, Rotary Control, MOD WHEEL, 10K, Special Taper	925-040269-001
R160	Resistor, Rotary Control, PITCH WHEEL, Linear, 10K	925-040830-003
	Cabinet Assembly	967-045358-941
	Base	967-045429-001
	Foot, Rubber, 5/8 in. dia. x 5/16	916-045475-001
	Transformer, Plug-In, 120V, 50/60Hz	935-045370-001
	Transformer, Plug-In, 220V, 50/60Hz	935-045385-001
	Stand Assembly, Telescoping	935-045620-001

PRINTED CIRCUIT BOARD ASSEMBLY SELECTED REPLACEMENT PARTS LIST

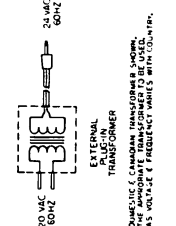
REF DESIG	DESCRIPTION	PART NO.
L1	LED, Red, High Intensity	939-041850-004
CR1, CR5, CR6,	Diode, Signal, 1N4148	919-041075-001
CR7, CR10	Diode, Zener, 8.2 Volt, 1N5237A	919-0411349-004
CR2	Diode, Low Leakage, FDH333	919-044466-001
CR3, CR4	Diode, Rectifier, 1N4004	919-042019-001
CR8, CR9		

PRINTED CIRCUIT BOARD ASSEMBLY SELECTED REPLACEMENT PARTS LIST (Continued)

REF DESIG	DESCRIPTION	PART NO.
C7, C14, C24,	Capacitor, Alum. Elect., 10ufd, 25V	945-044465-003
C39, C40	Capacitor, Low Leakage, Alum. Elect., 6.8ufd, 16V	945-045049-001
C13, C24	Capacitor, Alum. Elect., 220ufd, 6.3V	945-040209-003
C28	Capacitor, Alum. Elect., 1000ufd, 35V	945-040209-011
C37, C38	Resistor, Rotary, Audio, 1 Meg	925-045012-004
R13		
R16, R24, R72,	Resistor, Carbon Trim, Vertical Mount, 10K	925-045364-001
R97, R139	Resistor, Rotary, Rev. Audio, 1 Meg	925-045012-005
R43	Resistor, Cermet Trim, Vertical Mount, 500Ω	925-042526-006
R48, R54	Resistor, Cermet Trim, Vertical Mount, 100K	925-042526-005
R155	Resistor, Cermet Trim, Vertical Mount, 10K	925-042526-003
R51, R58	Resistor, 1 Watt +/- 1%, Temp. Comp., 100Ω	924-040183-002
R53, R56	Resistor, Slide, Linear, 10K	925-045013-001
R66, R68, R120	Resistor, Rotary, Linear, 10K	925-045012-001
R70, R86	Resistor, Slide, Audio, 1 Meg	925-045013-002
R103, R104	Resistor, Slide, Linear, 10K	925-045013-001
R116, R118	Resistor, Slide, Audio, 50K	925-045013-004
R129	Resistor, Rotary, Audio, 10K	925-045012-003
R148	Socket, Component Lead	906-045374-001
	Socket, 7 Pin, SIL	906-040307-007
	Heat Sink	967-040935-001
J1, J2	Jack, Phone, 2 Circuit, Switchcraft 111	910-041306-004
J3	Jack, Phone, Ins. 2 Circuit, Switchcraft N-112	910-041306-007
J4	Jack, Phone, Ins. 2 Circuit, Switchcraft N11	910-041306-006
J5	Jack, Miniature	910-045371-001
SW1, SW2, SW5,	Switch, Lever, 2P2T	960-045214-001
SW7, SW8, SW10		
SW3, SW4, SW6,	Switch, Lever, 2P3T	960-045216-001
SW9	IC, Dual Operational Amplifier, Special, LF353	991-042908-002
U1	IC, Dual Operational Amplifier, 4558	991-041146-001
U2, U4, U5,	IC, Noise Generator, 5837	991-042016-001
U12, U17	IC, Dual Operational Amplifier, LF353	991-042908-001
U3	IC, Trans Array, 3046	991-041104-001
U6, U15	IC, Operational Amplifier, LF351	991-042739-001
U7, U14	IC, Dual Voltage Comparator, LM393	991-042388-001
U8, U10	IC, CMOS, Dual Complementary Pair plus Inverter, 4007	991-041086-001
U9, U11	IC, Operational Amplifier, 3080A	991-041089-001
U13	IC, +12 Volt Regulator, 78M12	991-041112-002
U16	IC, -12 Volt Regulator, 79M12	991-0444316-001
U18	Transistor, NPN, 2N3904	991-041051-002
Q1, Q14, Q16	Transistor, PNP, 2N3906	991-041052-002
Q2, Q5, Q6, Q15	Transistor, N-Channel FET, U3078	991-042659-001
Q3, Q4		



NOTES:
 1. UNLESS OTHERWISE SPECIFIED, ALL RESISTORS ARE IN OHMS (R, K, M, Ω).
 2. * INDICATES RESISTOR MATCHED TO OUTPUT.
 3. WAVEFORM INDICATED IN SHOWN ARE TYPICAL FROM THAT POINT IN THE CIRCUIT.
 4. RESISTORS ARE THERMALLY COUPLED TO U/P.



BOARD 2

BOARD 1

USING KEYBOARD IN-OVERRIDE IN-TUNE KEYBOARD

KEYBOARD IN-TUNE

REMOTE KEYBOARD

RECEIVE KEYBOARD

TRIGGER IN-TUNE

TRIGGER OUT-TUNE

KEYBOARD IN-TUNE

KEYBOARD OUT-TUNE

KEYBOARD IN-TUNE

KEYBOARD OUT-TUNE

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