NO. 993-043989-0

TECHNICAL SERVICE INFORMATION for

TOUCHED BY SOUND
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Domestic Model 336
Export Model 336BX
(ABOVE SERIAL NO. 4160)

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INTRODUCTION

The Moog Prodigy Synthesizer, Domestic Model 336A and Export Model 336BX, consists of a 32 note F to C keyboard, two voltage controlled oscillators, two envelope generators, one voltage controlled low pass filter, one voltage controlled amplifier, and a regulated power supply.

ALIGNMENT PROCEDURE

The method outlined below is a suggested procedure for aligning a Prodigy using standard available test equipment.

TEMPERATURE ADJUSTMENT

> **NOTE**
> This adjustment should be made at an ambient temperature of 72°F (22°C) if possible. If not, use the appropriate correction factor shown in Table 1.

a) Before applying power to the board, apply a short across R17 and apply a separate short across R38. If power has already been connected, short out both resistors and allow five minute warm-up period before making the next measurement.

b) Measure the voltage at pin 5 of U2B with DVM. Note reading.

c) Remove short across R17 and adjust "Osc 1 Temp Trim" R14 until DVM reads 60mV below original reading. Wait 30 seconds and readjust if necessary. If ambient temperature is different from 72°F, use the following table:

TABLE 1 CORRECTION FACTOR

°F	°C	mV DROP
62	16	70
67	19	65
72	22	60
77	25	55
82	28	50

d) Repeat procedure for Osc 2 Temp adjustment except:

1. Use pin 5 of U4B for voltage adjustment.

2. Remove short on R38 and adjust for correct voltage drop using "Osc 2 Temp Trim" R35.

KEYBOARD SCALE ADJUSTMENT

a. Connect a Digital Voltmeter to pin 1 of U12A.

b. Depress and hold F1 and note voltage.

c. Depress and hold F2 and adjust "Keyboard Scale Trim" R192 until Digital Voltmeter indicates voltage noted in step b plus 1.000 volts.

OSCILLATOR 1 SCALE, FREQUENCY AND HI END ADJUSTMENTS

a. Allow unit to warm up for 15 minutes before making these adjustments.

b. Set the following controls:

1. TUNE	electrical 0
2. OSCILLATOR 1 OCTAVE	32′
3. PITCH wheel	center detent
4. OSCILLATOR MOD	OFF

c. Center the following trimpots:

1. "Osc 1 Freq Trim" R1
2. "Osc 1 Scale Trim" R7
3. "Osc 1 Hi End Trim" R42

d. Depress and hold F3 and zero beat against a frequency of 174.6Hz using "Osc 1 Freq Trim" R1.

e. Depress and hold F1 and zero beat against a frequency of 43.6Hz using "Osc 1 Scale Trim" R7.

f. Repeat steps d and e until perfect 2 octave spread is obtained.

g. Change OSCILLATOR 1 OCTAVE switch to 8′ range.

h. Depress and hold F1 and zero beat against a frequency of 174.6Hz using "Osc 1 Freq Trim" R1.

i. Depress and hold F3 and zero beat against a frequency of 698.4Hz using "Osc 1 Hi End Trim" R42.

j. Repeat steps h and i until a perfect 2 octave spread is obtained.

k. Repeat steps d through j until tuning is satisfactory on all ranges.

l. Change OSCILLATOR 1 OCTAVE switch to 32′ range. Depress F1 and tune "Osc 1 Freq Trim" R1 for a frequency of 43.6Hz.

OSCILLATOR 2 SCALE, FREQUENCY, AND HI END ADJUSTMENTS

a. Allow unit to warm up for 15 minutes before making these adjustments.

b. Set the following controls:

1. TUNE	electrical 0
2. OSCILLATOR 2 OCTAVE	16′
3. PITCH wheel	center detent
4. OSCILLATOR MOD	OFF
5. OSCILLATOR 2 INTERVAL	0

c. Center the following trimpots:

1. "Osc 2 Freq Trim" R20
2. "Osc 2 Scale Trim" R28
3. "Osc 2 Hi End Trim" R60

d. Depress and hold F3 and zero beat against a frequency of 349.2Hz using "Osc 2 Freq Trim" R20.

e. Depress and hold F1 and zero beat against a frequency of 88.8Hz using "Osc 2 Scale Trim" R28.

f. Repeat steps d and e until a perfect 2 octave spread is obtained.

g. Change OSCILLATOR 2 switch to 4′ range.

h. Depress and hold F1 and zero beat against a frequency of 349.2Hz using "Osc 2 Freq Trim" R20.

i. Depress and hold F3 and zero beat against a frequency of 1396.5Hz using "Osc 2 Hi End Trim" R60.

j. Repeat steps h and i until a perfect 2 octave spread is obtained.

k. Repeat steps d through j until tuning is satisfactory on all ranges.

l. Change OSCILLATOR 2 OCTAVE switch to 16′ range. Depress F1 and tune "Osc 2 Freq Trim" R20 for a frequency of 82.4Hz.

FILTER SCALE, EMPHASIS, AND FILTER CUTOFF FREQUENCY ADJUSTMENTS

a. Set the following controls:

1. FILTER KYBD TRACKING	OFF
2. EMPHASIS	fully clockwise
3. Filter CUTOFF FREQUENCY	0
4. CONTOUR AMOUNT	0

b. Depress and hold F1.

c. Verify filter is oscillating.

d. Adjust "Filter Freq Trim" R140 until frequency of oscillator is 660Hz ± 50Hz.

e. Adjust "Emphasis Trim" R135 until sine wave oscillation at output of U16B is -23dB ± 3dB.

f. Switch FILTER KYBD TRACKING control to FULL.

g. Using Filter CUTOFF FREQUENCY control R141, zero beat filter against a frequency of 349.2Hz.

h. Depress F3 and zero beat filter against a

frequency of 1396.5Hz using "Filter Scale Trim" R152.

i. Repeat steps g and h until perfect 2 octave spread is obtained.

j. Reset Filter CUTOFF FREQUENCY control R141 to 0 and FILTER KYBD TRACKING control to OFF.

k. Using "Filter Freq Trim" R140, reset filter frequency to 666Hz ± 10Hz.

VCA BALANCE ADJUSTMENT

a. Set the following controls:

1. MOD RATE	30Hz
2. MOD SHAPE	⎍
3. MIXER OSCILLATOR 2 and OSCILLATOR 2	fully counter-clockwise

b. Connect a 20K ohm resistor between output of U13A and emitter of Q39.

c. Adjust "VCA Balance Trim" R120 for minimum level at output of U16A.

SELECTED REPLACEMENT PARTS LIST

REF DESIG	PART NUMBER	DESCRIPTION	QTY
C1,C3	947-044464-470	Capacitor, Tubular, 47pf	2
C2,C4 thru C7, C10,C13,C16, C17,C18,C24, C37,C40,C41	947-044499-103	Capacitor, Tubular, .01uf	14
C8	946-040229-222	Capacitor, Polyester, .0022uf	1
C9,C15,C30	947-044464-101	Capacitor, Tubular, 100pf	3
C11,C19	947-044464-501	Capacitor, Tubular, 500pf	2
C12,C20	947-044464-100	Capacitor, Tubular, 10pf	2
C14	947-044346-102	Capacitor, Polypropylene, .001uf	1
C21	946-040231-003	Capacitor, Tantalum, 2.7uf/35V	1
C22	947-044464-102	Capacitor, Tubular, .001uf	1
C23	946-041978-334	Capacitor, Polyester, .33uf	1
C25	946-041978-105	Capacitor, Polyester, 1uf	1
C26	945-040209-005	Capacitor, Aluminum Electrolytic	1
C27,C32,C33, C34	946-041978-273	Capacitor, Polyester, .027uf	4
C28,C29,C31	946-041978-104	Capacitor, Polyester, .1uf	3
C35	945-040209-003	Capacitor, Aluminum Electrolytic, 220uf/6.3V	1
C36,C45	945-040209-015	Capacitor, Aluminum Electrolytic, 10uf/16V	2
C38,C39	946-040231-002	Capacitor, Tantalum, 10uf/20V	2
C42,C43	945-040209-007	Capacitor, Aluminum Electrolytic, 470uf/35V	2
C44,C46	946-040231-004	Capacitor, Tantalum, 6.8uf/20V	2
CR1,CR2,CR5 thru CR9	919-041075-001	Diode, Signal, 1N4148	7
CR3,CR4	919-044466-001	Diode, Low Leakage, FDH333	2
CR10 thru CR13	919-042019-001	Diode, Rectifier, 1N4004	4
CR14	939-041850-001	LED, 15mA, Red, Hi Intensity, Power	1
F1	939-041620-001	Fuse, Slo Blo, 125mA, 250V	1
F1*	939-044094-007	Fuse, 5mm x 20mm, 63mA	1
F2,F3*	939-044094-006	Fuse, 5mm x 20mm, 250mA	2
J1	910-041306-001	Phone Jack, 1 Circuit, .250 dia	1
Q6,Q12,Q15, Q17,Q19,Q38, Q42	991-041051-001	Transistor, NPN, 2N3904	7
Q13,Q14,Q16, Q20 Q18,Q37,Q39	991-041055-001	Transistor, FET, N-Chan, E112	4
Q40,Q41,Q43	991-041052-001	Transistor, PNP, 2N3906	6
Q23 thru Q28	991-042017-001	Transistor, NPN, 2N3392	6
R1	925-042526-003	Resistor, Trim Pot, 10K Ohm, Cermet	1
R7,R28	925-042526-006	Resistor, Trim Pot, 500 Ohm, Cermet	2
R14,R35	925-042389-004	Resistor, Trim Pot, 500 Ohm, Cermet	2
R19,R47,R74, R95,R141,R150, R162,R172	925-042550-002	Resistor, Rotary, 10K Ohm, Linear	8
R20	925-042526-003	Resistor, Trim Pot, 10K, Cermet	1
R42,R60	925-040275-004	Resistor, Trim Pot, 10K Ohm, Carbon	2
R83	925-042550-007	Resistor, Rotary, Audio, 10% LOG	1
R92	925-042389-002	Resistor, Trim Pot, 10K Ohm, Cermet	1
R106	925-042550-005	Resistor, Rotary, 2.5 Megohm, Audio, 10% CCW LOG	1

SELECTED REPLACEMENT PARTS LIST (Continued)

REF DESIG	PART NUMBER	DESCRIPTION	QTY
R120,R140	925-040275-001	Resistor, Trim Pot, 100K Ohm, Carbon	2
R122	925-042550-001	Resistor, Rotary, 5K Ohm, Audio LOG	1
R135	925-040275-002	Resistor, Trim Pot, 1K Ohm, Carbon	1
R136	925-042550-003	Resistor, Rotary, 50K Ohm, 10% CCW LOG	1
R152	925-040275-011	Resistor, Trim Pot, 470 Ohm, Carbon	1
R155,R158, R166,R169	925-042550-004	Resistor, Rotary, 1 Megohm, Audio	4
SW1,2,4,5,6,	960-041752-001	Switch, Slide, 2P3T, UID	6
SW3, 7 thru 10	960-041751-001	Switch, Slide, 2P2T, UID	4
U1,U3	991-041104-002	Integrated Circuit, Trans Array, CA3046	2
U2,U4,U12**	991-042908-001	Integrated Circuit, Dual Operational Amplifier, LF353	3
U5,U8,U11, U13,U16,U22	991-041146-001	Integrated Circuit, Dual Operational Amplifier, 4558	6
U6,U9	991-042388-001	Integrated Circuit, Dual Voltage Comparator, LM393	2
U7,U10	991-042386-001	Integrated Circuit, Operational Amplifier, TL081C	2
U14,U15	991-041104-001	Integrated Circuit, Trans Array, CA3046	2
U17	991-041089-003	Integrated Circuit, Operational Trans Amplifier, LM3080AN	1
U18,U19	991-041086-001	Integrated Circuit, CMOS, Dual Comp, Pair Invert, 4007	2
U20	991-041112-002	Integrated Circuit, + 12V Voltage Regulator, 78M12	1
U21	991-044316-001	Integrated Circuit, – 12V Voltage Regulator, 79M12	1
U23	991-041109-001	Integrated Circuit, Dual Timer, 556	1
T1	954-044309-001	Transformer, Domestic Model	1
T1*	954-044334-001	Transformer, 220V	1
	967-044089-001	Cabinet and Chassis	1
	915-040922-001	Cap, Glamor, Slide Switch, White	10
	932-041642-002	Carton, Shipping	1
	967-044093-001	Base	1
	961-041178-001	Detent, Spring	1
	962-041179-001	Detent, Teflon	1
	916-042584-001	Foot, 7/8 in. Dia. x 33/8 in., Black Rubber	4
	967-040935-001	Heat Sink	2
	997-041305-002	Knob Assembly	16
	979-044123-001	Keyboard, 32 Note	1
	997-044314-001	Owner's Manual	Ref
	997-041597-001	Wheel Assembly	2
	964-044471-001	White Key C	2
	964-044471-002	White Key D	2
	964-044471-003	White Key E	2
	964-044471-004	White Key F	3
	964-044471-005	White Key G	3
	964-044471-006	White Key A	3
	964-044471-007	White Key B	3
	964-044471-008	White Key, High C	1
	964-044472-001	Black Key	13
	975-044473-001	Spring No. 7	32
	960-044474-001	Switch Unit No. 6	3
	960-044474-002	Switch Unit No. 7	2
	914-044475-001	Damper 9B	1
	914-044475-002	Damper, 8B	1

* Used on Export Models Only

** On Later Versions Change Part Number of U12 to -002