Leslie
SPEAKERS

CAUTION
SEE SAFETY NOTE ON
NEXT SHEET

Not encluded

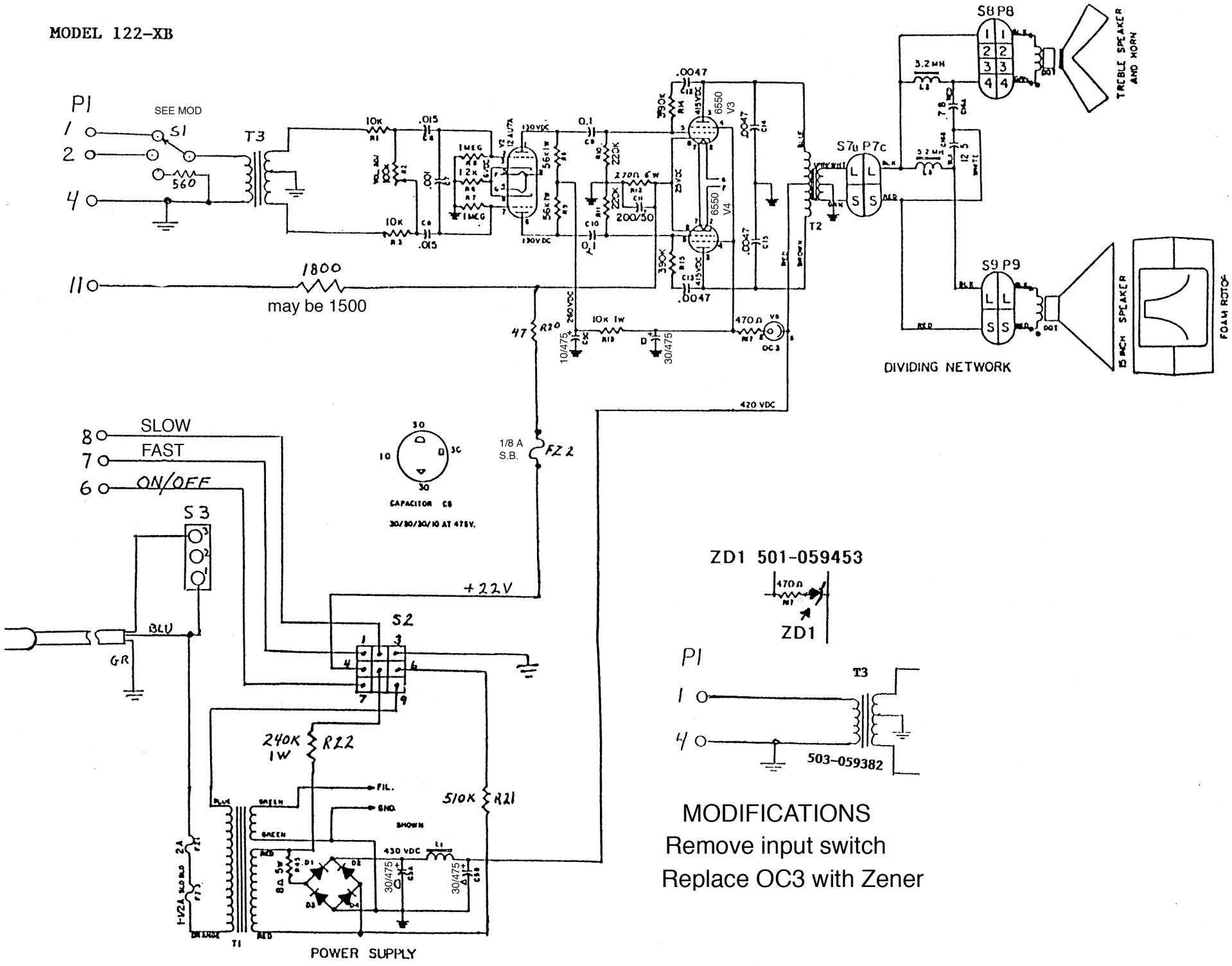
model

122XB

PRELIMINARY

Service Information
& Parts List

MODEL 122-XB



MODIFICATIONS

Remove input switch

Replace OC3 with Zener

MOTOR CONTROL BOARD 124-000735 THEORY OF OPERATION

The motor control circuitry consists of two opto isolator/triac combinations to pulse-width modulate and thus control speed in both the upper and lower motor assemblies. The desired speed is selected when control supply comm0r'1 is applied to one or the other control lines. Individual tachometer circuits for each motor provide feedback information to the motor control circuits. An automatic brake circuit is incorporated to minimize time between speed changes of the lower rotor.

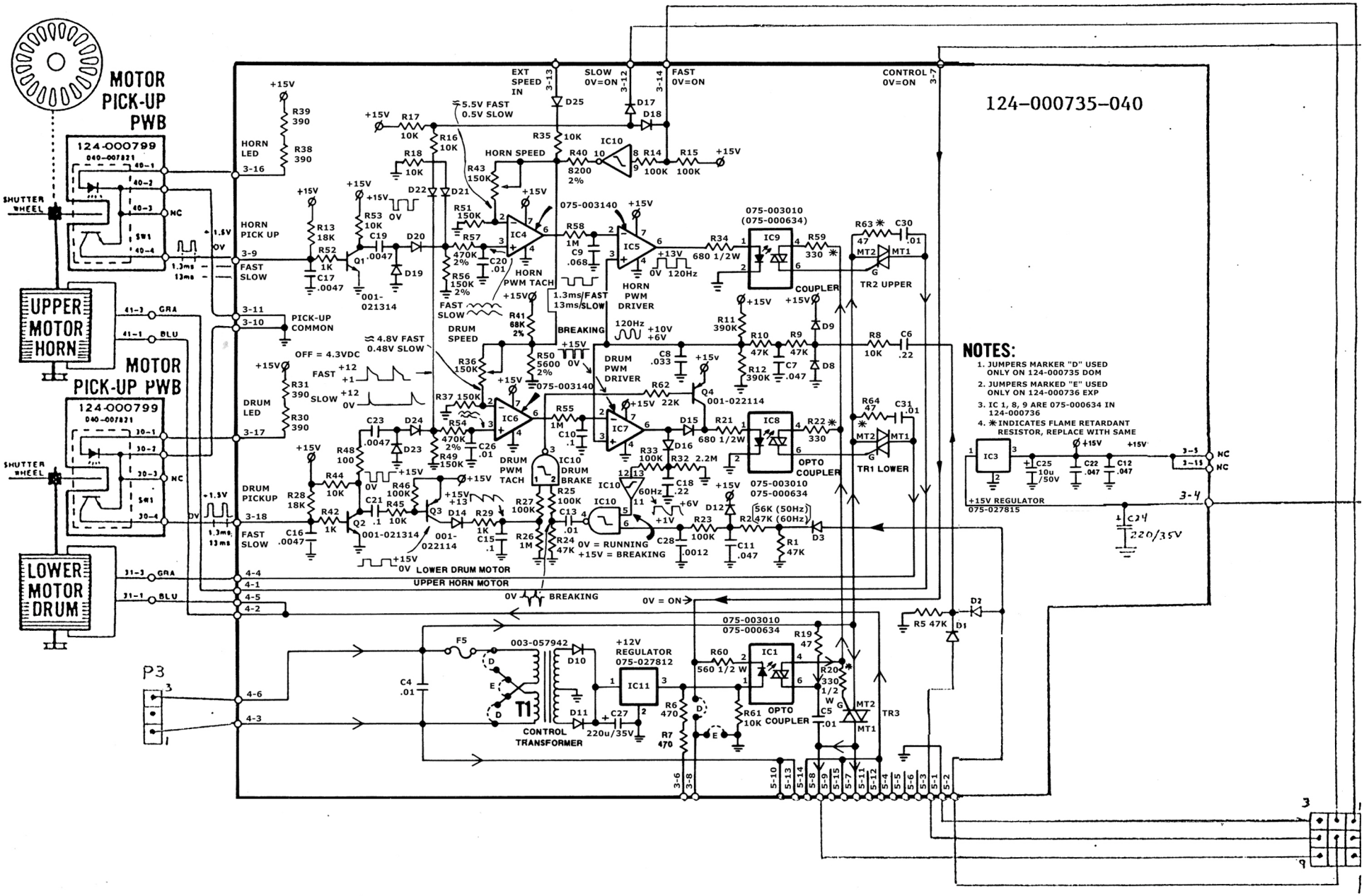
The majority of the circuitry on the PCB is concerned with motor control. There are two motor control circuits on the PCB. They are identical except for the incorporation of a dynamic brake circuit on the drum circuit. Since the operation of the two circuits is identical, only the drum portion will be described.

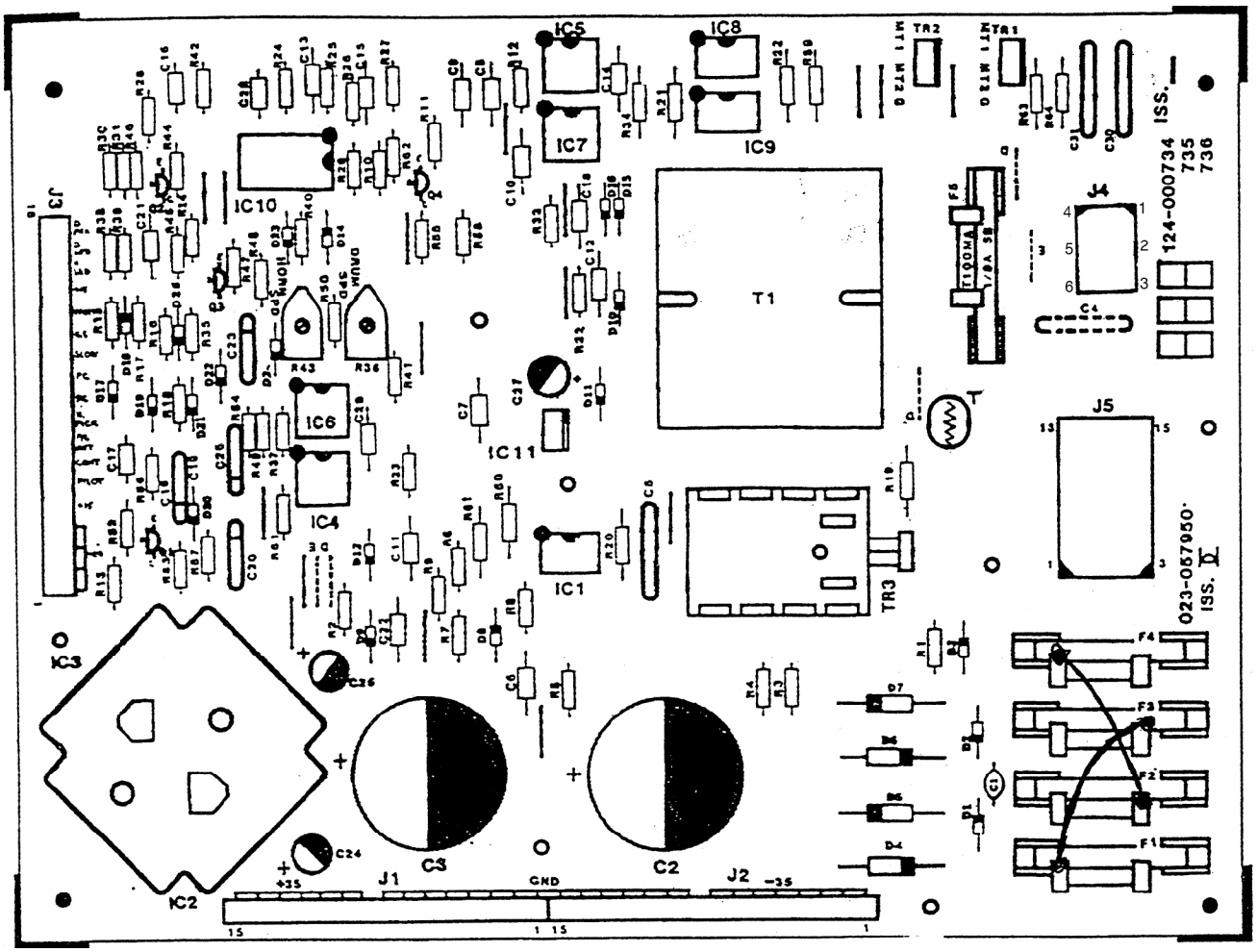
Tachometer feedback information in the form of square wave pulses enter the PCB at J3-18. R28 provides the DC load for the tachometer and C16 provides a degree of noise immunity. This signal is an approximately 1.5Vpp pulse and is routed to Q2. This results in a pulse of an amplitude and DC level which is determined by the motor speed. The pulse is smoothed somewhat by the action of C26, R54 and applied to IC6, which is configured as a comparator. This comparator has as one of its inputs a fixed DC voltage which is derived from the speed control switch and IC10. Some degree of adjustment is provided by a variable pot. IC6 compares the reference with the smoothed pulse (now similar to a triangle wave) and produces an output of varying pulse width. This output is integrated into a DC voltage by R55 and C10 and this DC voltage (which is now proportional to motor speed) is applied to IC? Power transformer secondary voltage is rectified by 01 and 02 to form pulsating DC at twice the line frequency and applied through C6and R8 to diodes 08 and 09.
These diodes ensure that the amplitude of the waveform is always within power supply limitations. C?, C8 and R10 provide filtering to smooth the waveform into one similar to a sine wave. This signal is applied to IC?, which is configured as a comparator.

The DC signal derived from R55/C 10 is used with the AC waveform to provide a pulse width signal which is synchronized to the AC line and whose width is. determined by the tachometer circuit. This pulse is applied to IC8 and used to gate triac TR1. If the motor speed is at the proper rate, only enough power will be supplied to it to maintain that rate. If an increased load occurs, the tachometer will slow down and the pulse width at IC? will increase. This will supply more power to the motor. When the tachometer reaches the proper speed, the pulse width will stabilize. This is essentially the operation of both circuits. The brake circuit is the exception. In normal tone cabinet operation, there are two spinning rotors. One is a relatively light weight assembly with a minimum of inertia. Therefore, the time lag between speed changes is small. The other rotor is somewhat large and more bulky. Its time lag is much larger. To minimize the time it takes to change speeds, the brake circuit is incorporated. This circuit operates on the principle that an AC motor is "locked" by the application of DC. Since no DC of the proper levels convenient for use, half wave AC which is suitable is used. Power transformer secondary AC is half wave rectified by 03 and applied to 012 and C11. These components provide much the same function as their counterparts in the previous circuitry. The signal is routed to IC10 and a NAND gate. This gate provides an output ONLY if the drum rotor does not have AC applied to it. The output from IC10 is applied to another NAND gate section of IC10. The output from this section only occurs if the rotor is running. Therefore, the brake will be applied only if the motor has no AC connected and only so long as it is in motion.

The output from the second section of IC 10 is applied to Q4, which is configured as an inverter. This transistor applies the half wave gating pulse to R21 which then drives the opto coupler.

MODEL 122-XB


MOTOR PICK-UP PWB
124-000799
040-007821
SHUTTER WHEEL
UPPER MOTOR HORN
MOTOR PICK-UP PWB
LOWER MOTOR DRUM
124-000735-040
EXT SPEED IN
SLOW 0V=ON
FAST 0V=ON
CONTROL 0V=ON
HORN LED
DRUM LED
HORN PICK UP
DRUM PICKUP
PICK-UP COMMON
FAST SLOW
HORN SPEED
HORN PWM TACH
HORN PWM DRIVER
DRUM SPEED
DRUM PWM DRIVER
DRUM PWM TACH
DRUM BRAKE
OPTO COUPLER
075-003010
075-000634
075-003140
001-021314
001-022114
LOWER DRUM MOTOR
UPPER HORN MOTOR
BREAKING
0V = RUNNING
+15V = BREAKING
0V = ON
+12V REGULATOR
075-027812
+15V REGULATOR
075-027815
003-057942
CONTROL TRANSFORMER
TR1 LOWER
TR2 UPPER
TR3
NOTES:
1. JUMPERS MARKER "D" USED ONLY ON 124-000735 DOM
2. JUMPERS MARKED "E" USED ONLY ON 124-000736 EXP
3. IC 1, 8, 9 ARE 075-000634 IN 124-000736
4. ✳INDICATES FLAME RETARDANT RESISTOR, REPLACE WITH SAME

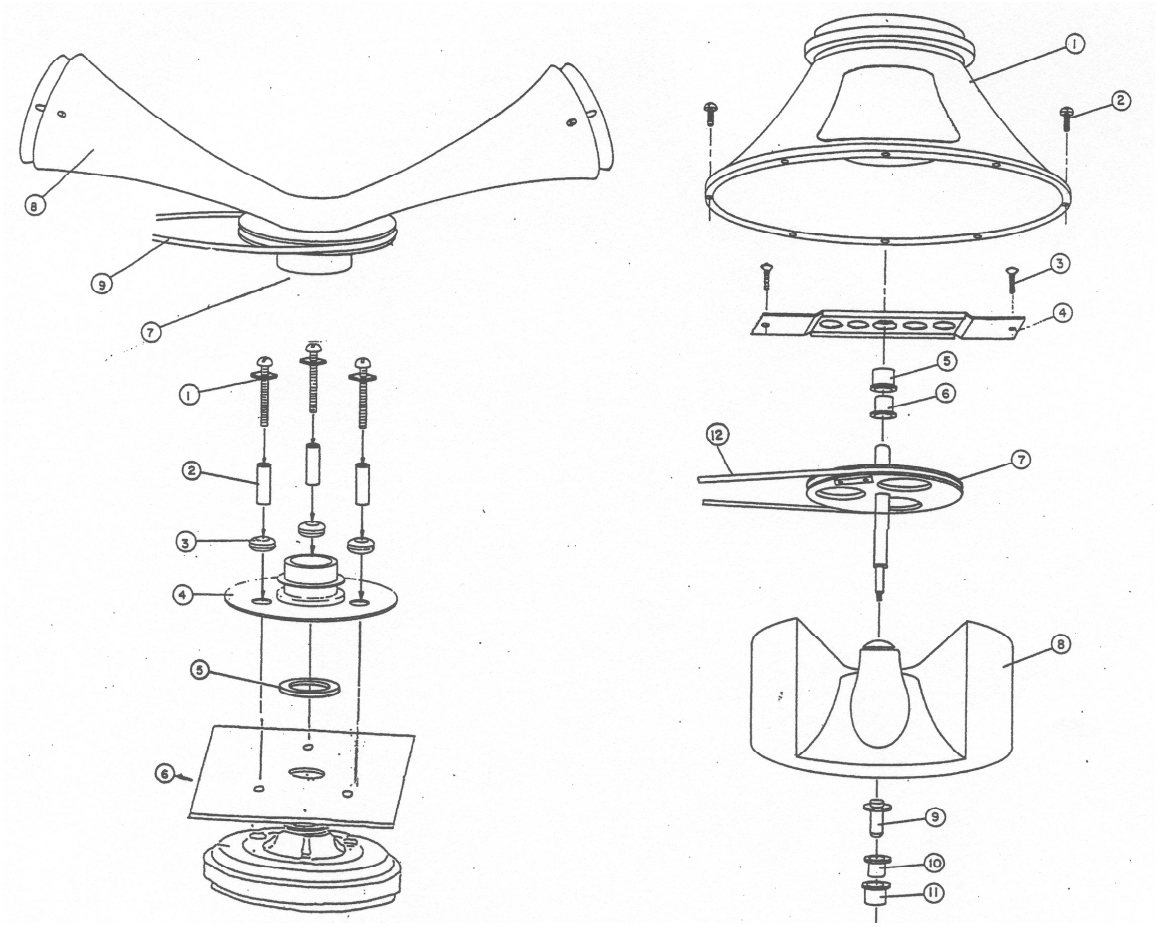


MOTOR CONTROL BOARD 124-000735-040

NOTE! BOARD IS NOT FULLY POPULATED

DESCRIPTION		PART NUMBER
Transistor Q1, 2	2N3858	001-021314
Q3,4	2N3905	001-022114
Diode, Rectifier		
D1, D2, D10, D11	*1A/400* P.I.V.	001-224054
Diode, Signal D3. 12-25	1N4148	001-226080
Triac TR1,2	*6A/200* P.I.V.	001-028022
TR3	*8A/400* P.I.V.	501-067561
Transformer T1		003-057942
18 Circuit Wafer	J3	005-044537
15 Circuit Wafer Connector	J1,2	005-044743
Plug & Terminal Asy	J4	005-053500
Receptacle & Terminal Asy	J5	*005-058032*
Fuse Clip (Domestic)	(10 used)	013-050528
(Export)	(10 used)	013-050529
Fuse Domestic .125A	(Plain)	016-050550
(Export) 100MA	(Cartridge)	016-050613
Thermistor/Surge Limiter		016-058379
Heat Sink for IC2,3		041-057481
Heat Sink for TR3		041-058011

Integrated Circuit IC1, 8, 9	(Domestic)	075-003010
IC 1,8,9	(Export)	075-000634
IC 4-7		075-003140
IC 11		075-027812
IC 3		075-027815
IC 10		075-004093
Capacitor, Electrolytic		
C 24, 25	10MFD/50V	432-106509
C 27	220MFD/35V	578-140827
Capacitor, Monolithic		
C 16, 17	4700MFD	438-210092
C 12, 14,22,29	.047MFD	438-210213
C 15, 21	.10MFD	438-210252
C 6, 18	.22MFD	438-210292
C 28	1200PFD	438-210262
C 13	.01MFD	440-210372
C 8	.033MFD	440-210432
C 7, 11	.047MFD	440-210452
C 9	.068MFD	440-210472
C 10	.1MFD	440-210492
Capacitor, Semko		
C 5, 30, 31	.01 (Export Only)	439-120251
Trimmer Pot R36, 43	150K	676-056994
Screw 4-40x3/8	(3 used)	827-040518
4-40x1-1/8	(2 used)	827-041718
Nut	(5 used)	999-001258



HORN ASSEMBLY 138681

Item	Part No.
1 Screw	589-026138
Lock Washer	589-138689
2 Bushing	517-051060
3 Grommet	543-050211
4. Spindle &Plate Assembly	*SEE BELOW
5 Washer, flat 5/8 x 1 1/2 x 1/8	589-050286
6 Ferro-fliud driver	514-059468
7 Bearing Hub	560-016816
Hub Screws (2 used)	589-019224
8 Horn Assembly	514-141155
9 Belt	522-141182

* Items 3, 4 & 5 purchased together as 560-059371

BASS ROTOR ASSEMBLY

Item	Part No.
1 Speaker, 15 inch, 16 ohm	514-052308
- - attaching parts -	
2 Screw, machine, 10-24 x 1 1/4	589-111570
3 Screw, machine, 8-32 x 3/4, Phillips	589-137380
4 Support, rotor	541-137256
5 Bearing, plastic	517-137264
6 Grommet, shoulder, neoprene	543-137255
7 Shaft and Pulley Assembly	522.137857
8 Rotor with Grommets, foam	548.137588.100
9 Shaft extension Assembly	520-137836
10 Bearing, plastic	517-137264
11 Grommet, shoulder, neoprene	543-137255
12 Belt, drive	522.141182