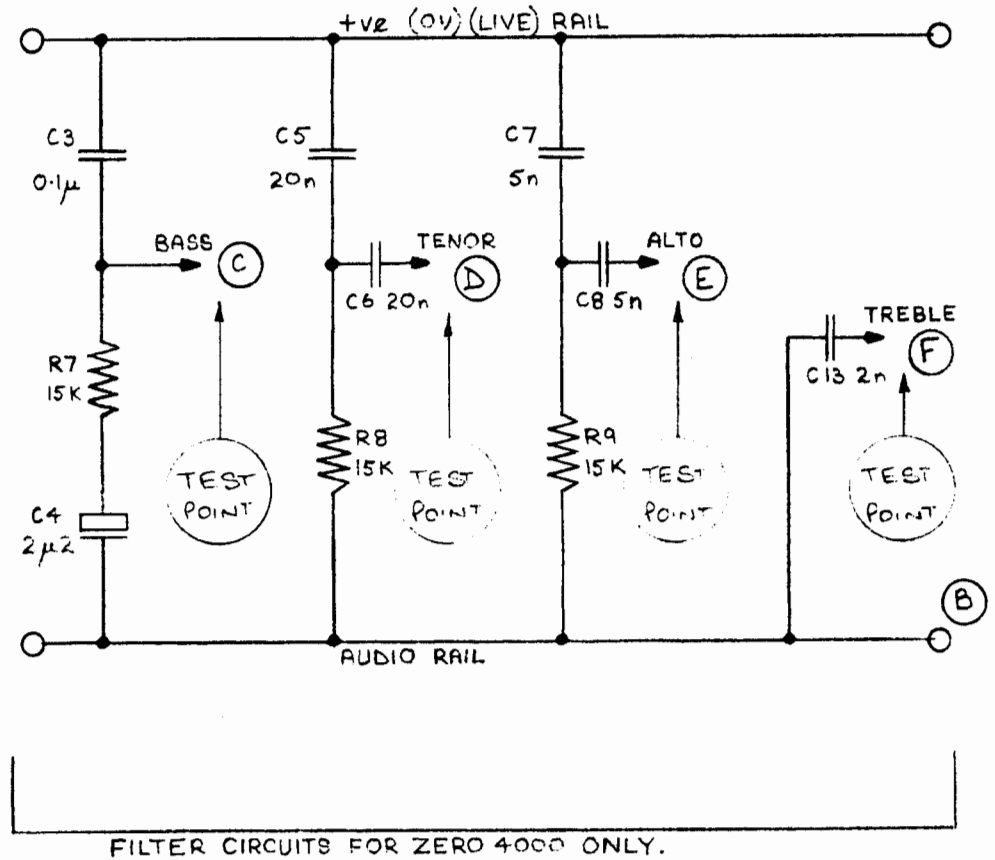
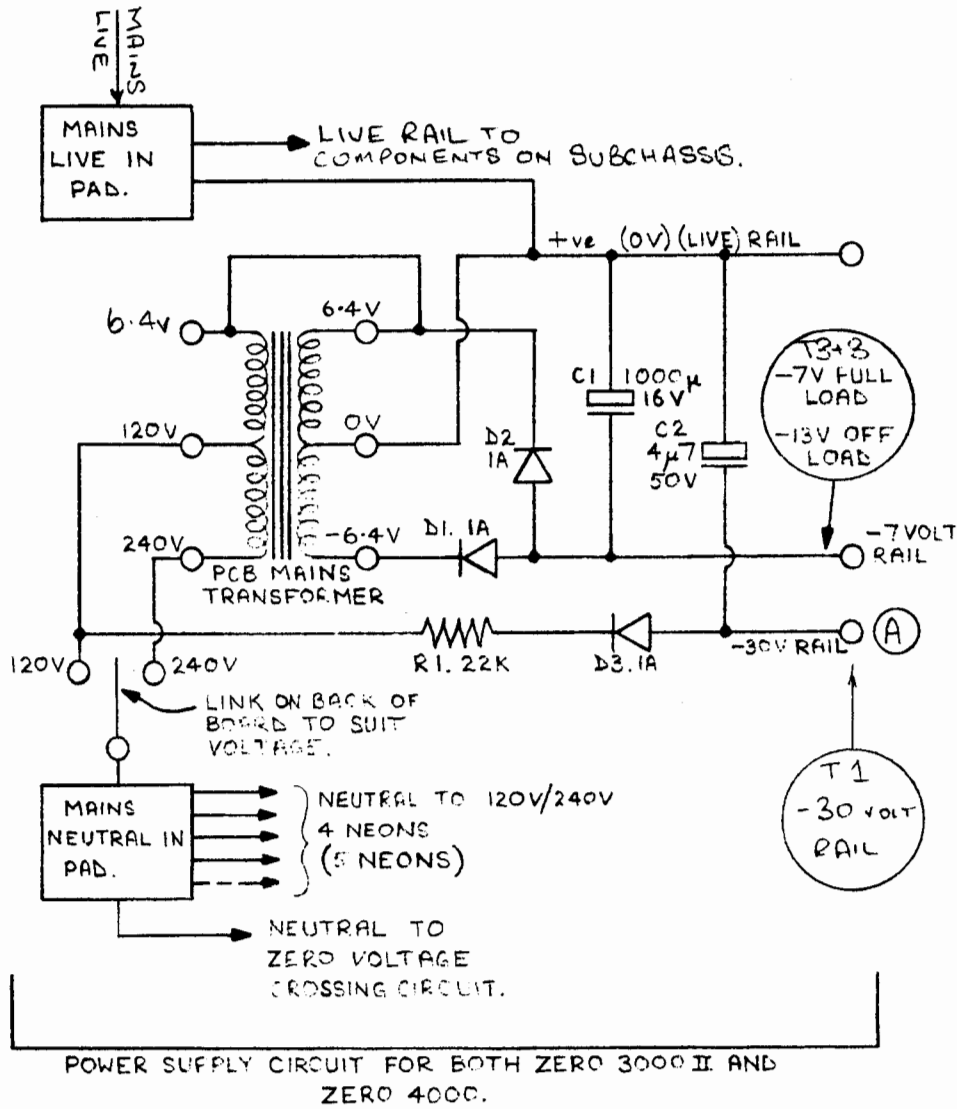


N.B. INFORMATION IN BRACKETS OR DOTTED LINES REFERS TO ZERO 4000 ONLY.

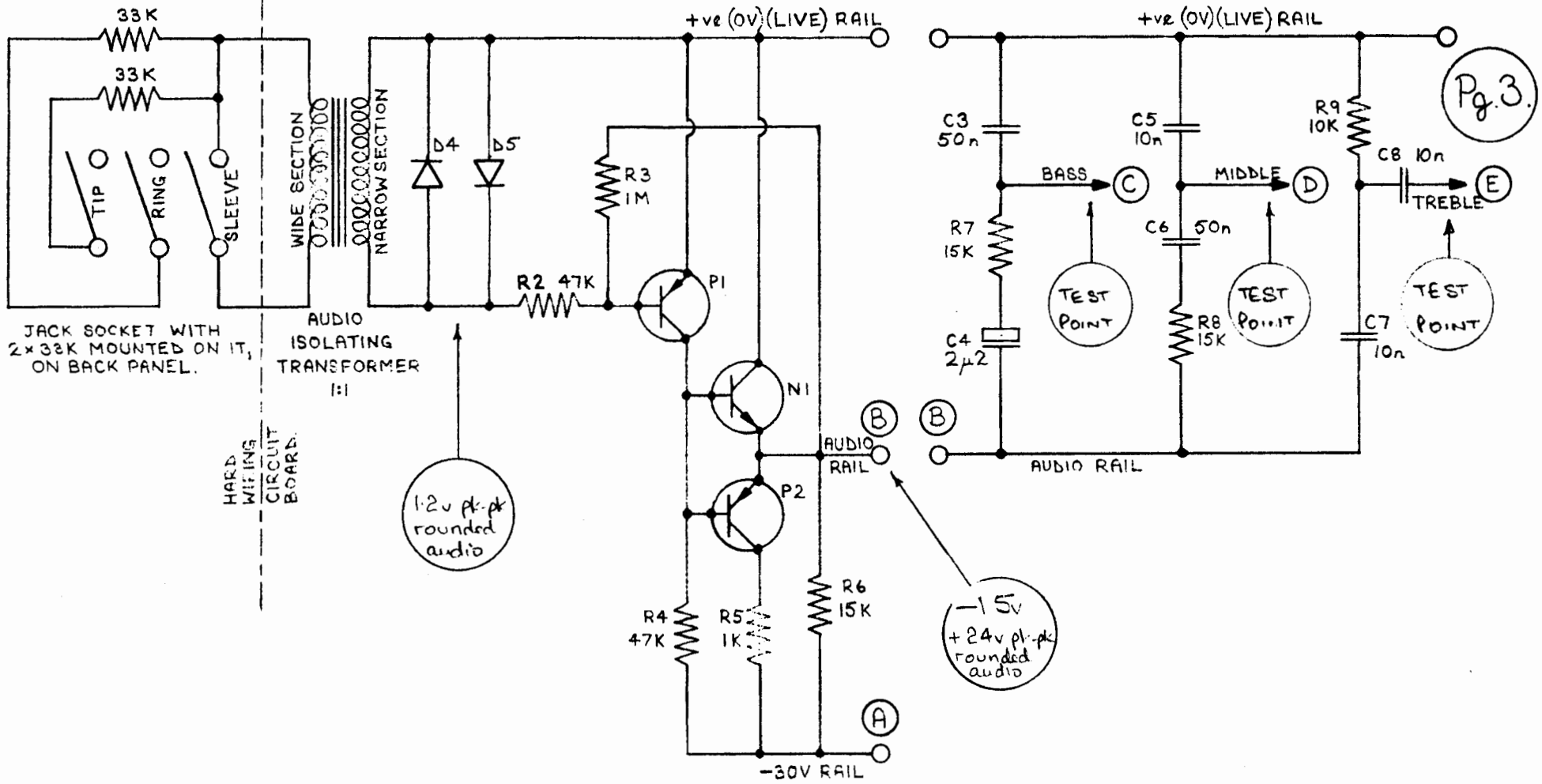
COMPONENT
LISTS
Pg 9+10



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ZERO 3000 II AND ZES 24000 CIRCUIT DIAGRAM

16/10/80 R.T.M.

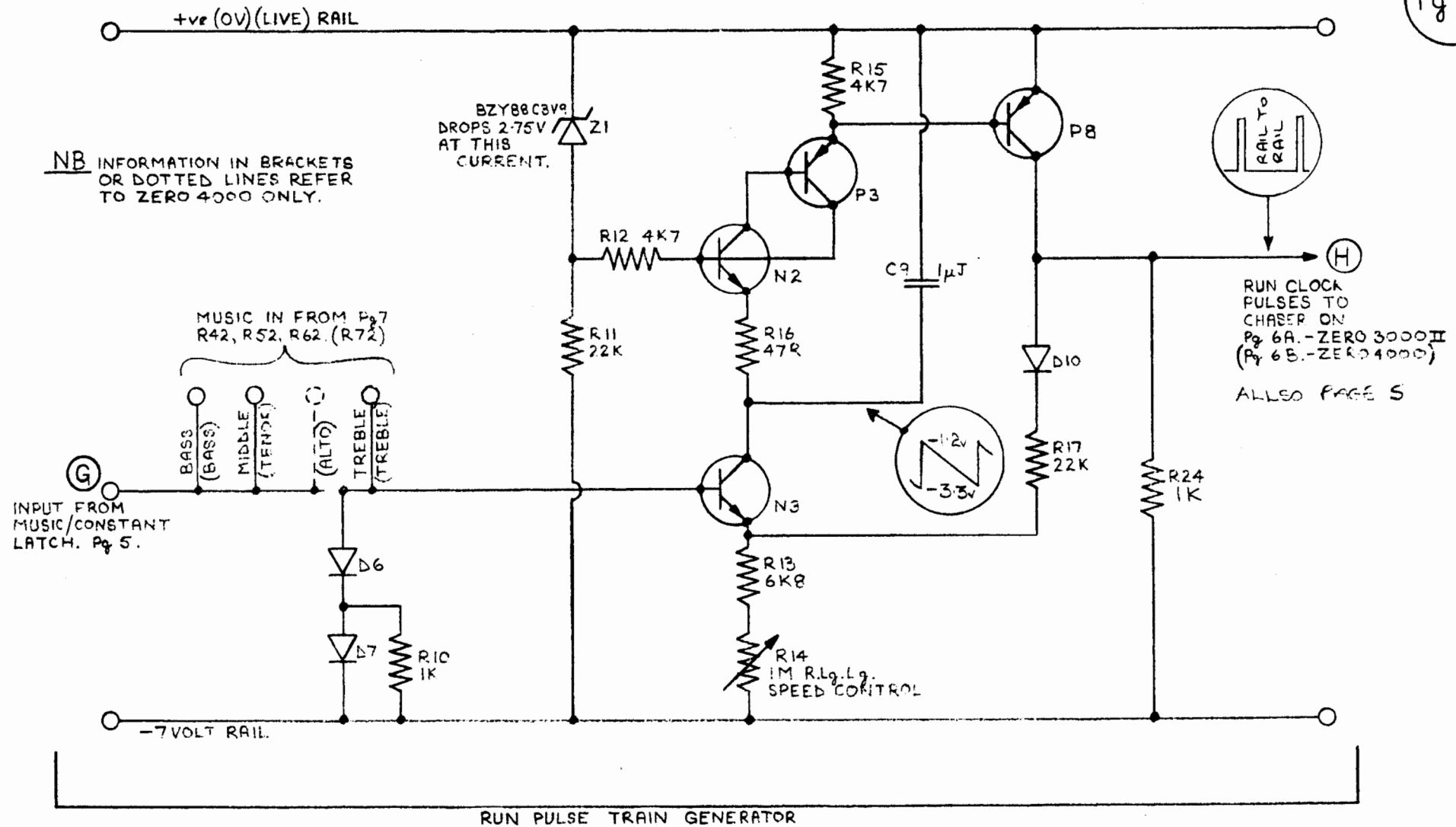


JACK SOCKET

ISOLATING LOG AUDIO AMP.

FILTER CIRCUITS FOR ZERO 3000 II ONLY.

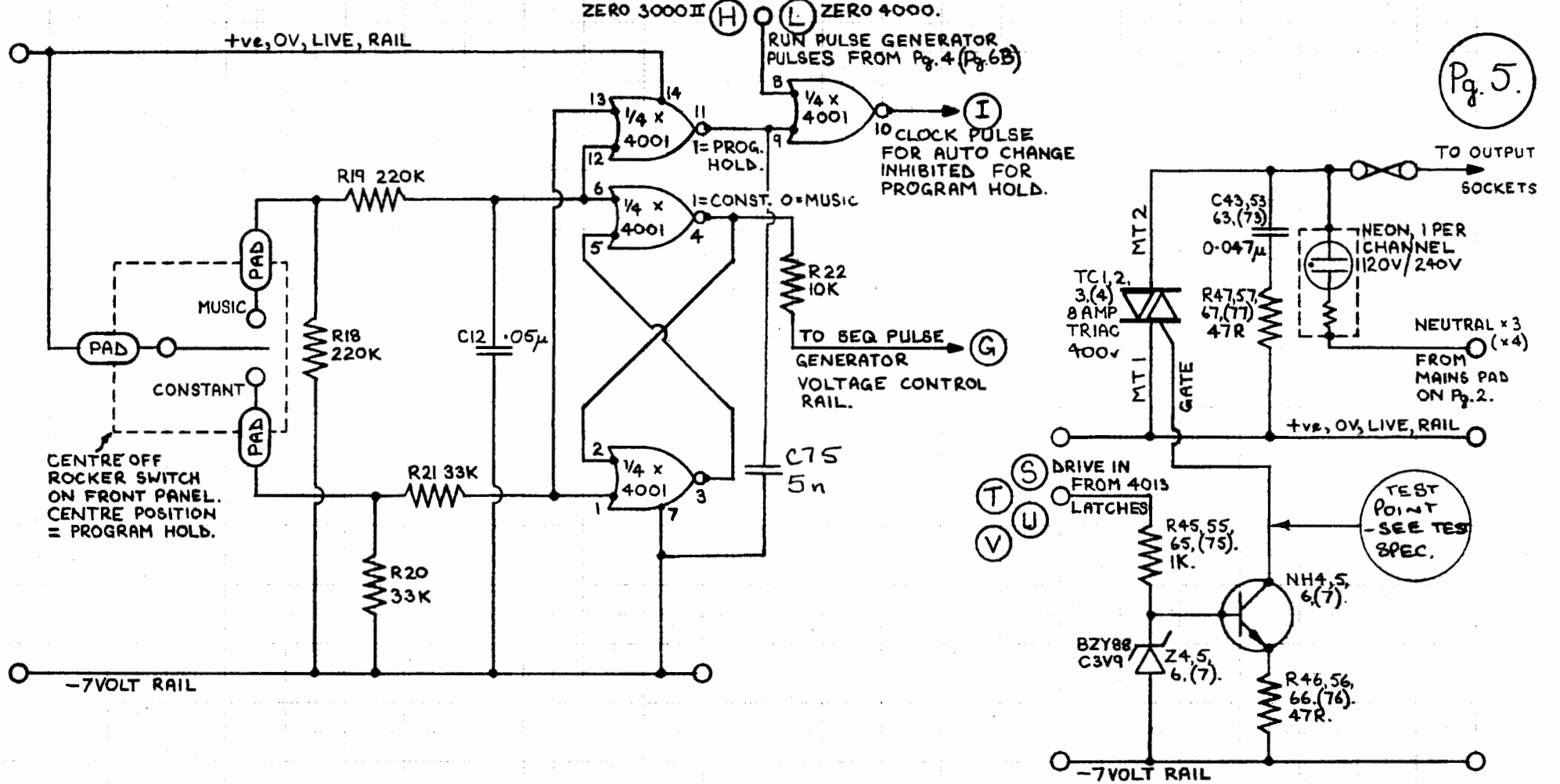
Pg. 3.



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ZERO 3000 II AND ZERO 4000 CIRCUIT DIAGRAM.

20/10/80 RJM



Pg. 5.

CENTRE OFF
ROCKER SWITCH
ON FRONT PANEL.
CENTRE POSITION
= PROGRAM HOLD.

RUN PULSE GENERATOR
PULSES FROM Pg. 4 (Pg. 6B)

10 CLOCK PULSE
FOR AUTO CHANGE
INHIBITED FOR
PROGRAM HOLD.

TO SEQ PULSE
GENERATOR
VOLTAGE CONTROL
RAIL.

NEON, 1 PER
CHANNEL
1120V/240V

NEUTRAL x 3
(x4)
FROM
MAINS PAD
ON Pg. 2.

TEST
POINT
- SEE TEST
SPEC.

MUSIC/PROGRAM HOLD/CONSTANT, LOGIC CIRCUIT.

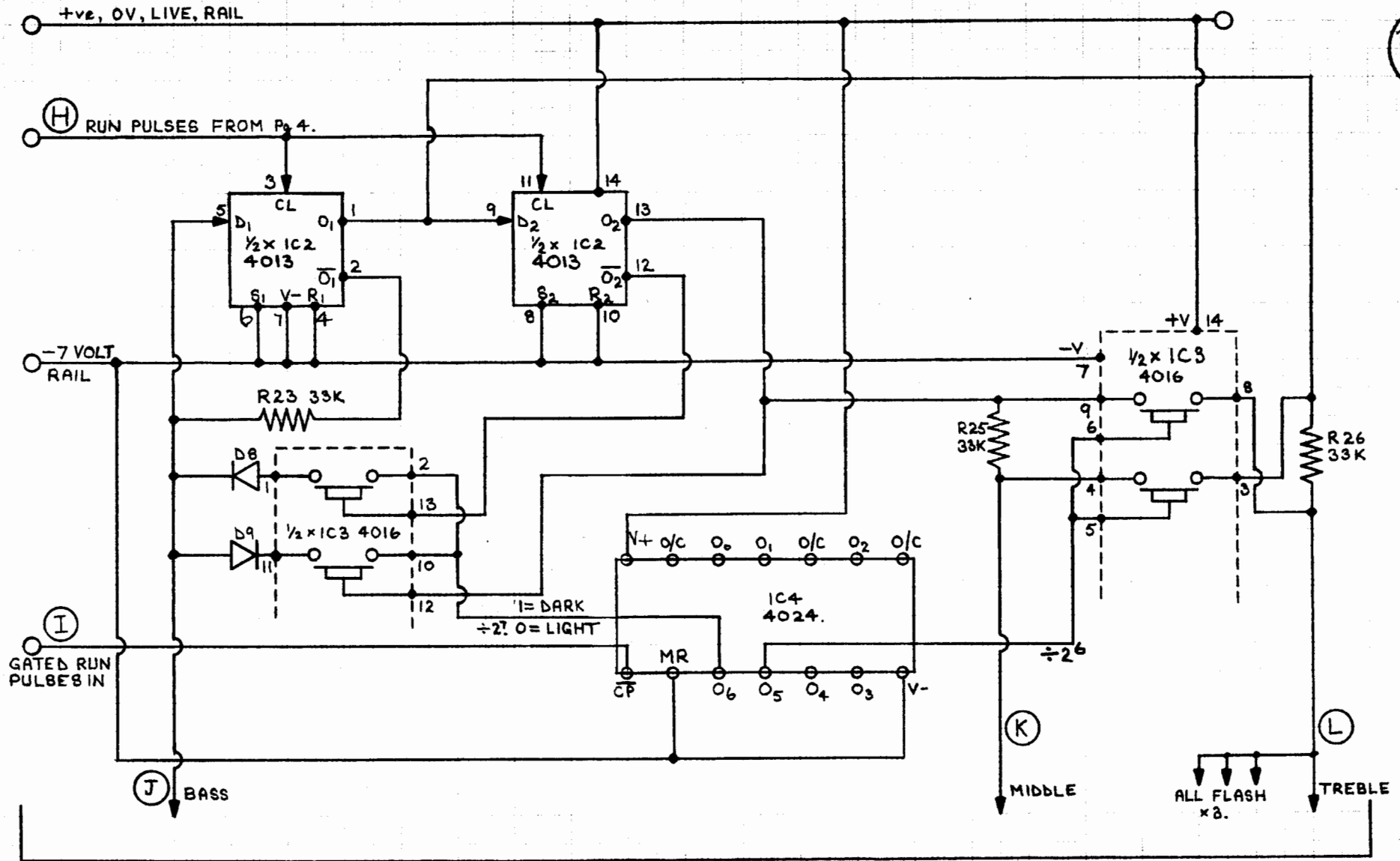
TRIACS MUST BE TO-220
ISOLATED TAB.
TRIAC DRIVE CIRCUIT AND TRIAC x3.(x4).

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ZERO 3000 CIRCUIT DIAGRAM

21/10/80 RTM.

Pg. 6A.



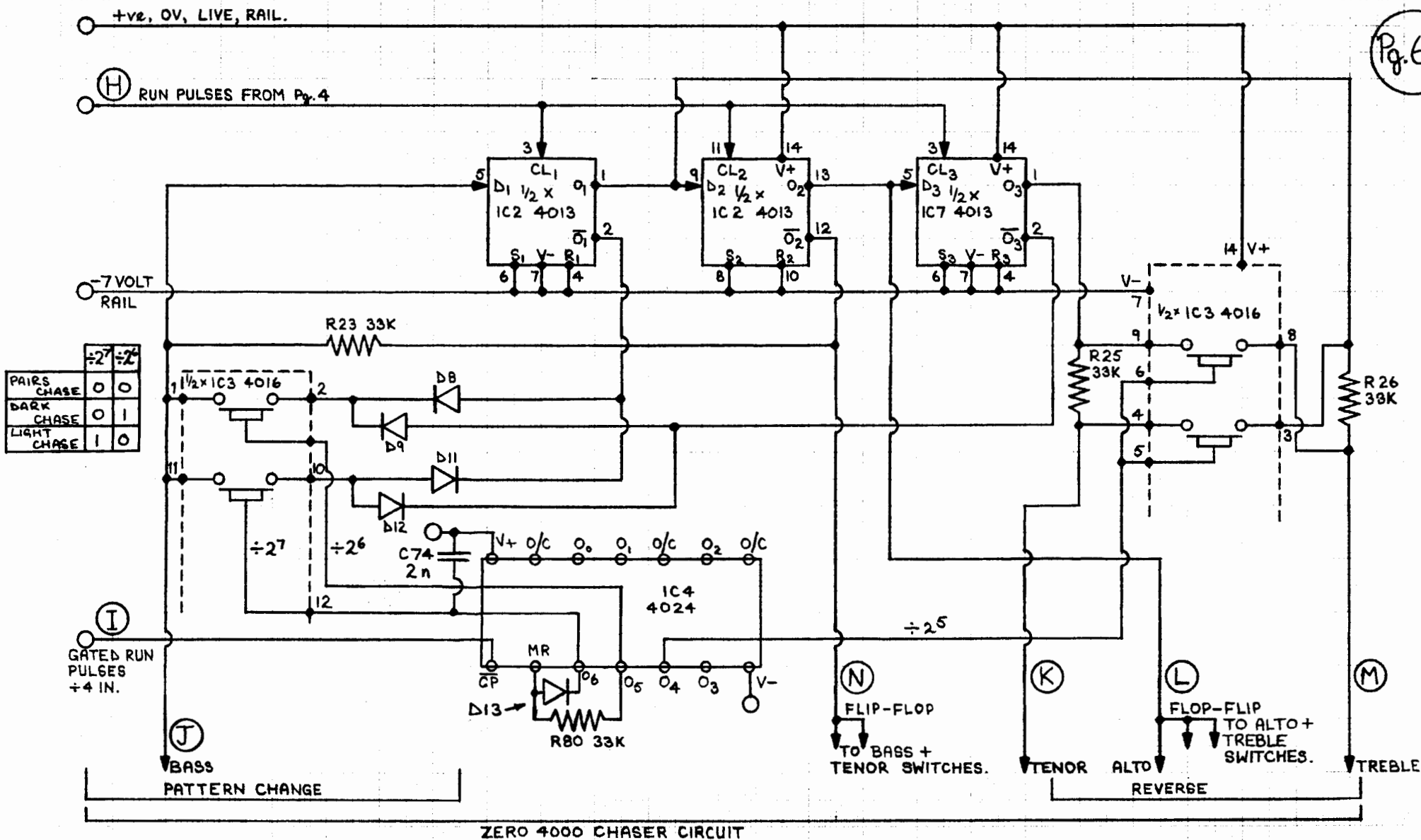
ZERO 3000 II CHASER CIRCUIT

© PULSAR LIGHT

ZERO 4000 CIRCUIT DIAGRAM

21/10/80.RJM

Pg. 6B



ZERO 4000 CHASER CIRCUIT

© PULSAR LIGHT

ZERO 3000 II AND ZERO 4000 CIRCUIT DIAGRAM

28/10/80 RJM

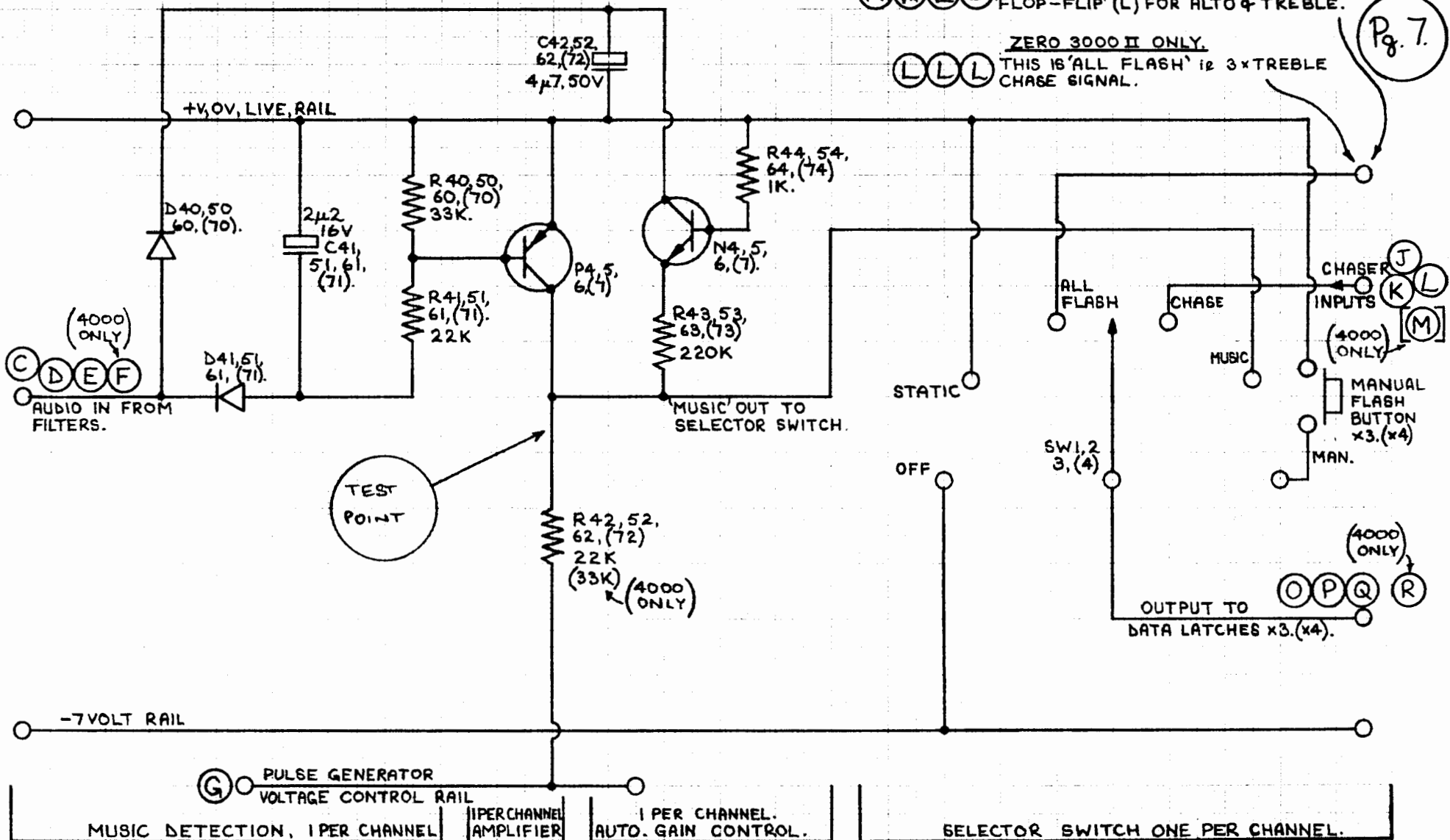
ZERO 4000 ONLY

(N N L L) THIS IS 'FLIP-FLOP' (N) FOR BASS & TENOR.
'FLOP-FLIP' (L) FOR ALTO & TREBLE.

ZERO 3000 II ONLY

(L L L) THIS IS 'ALL FLASH' ie 3x TREBLE CHASE SIGNAL.

Pg. 7.



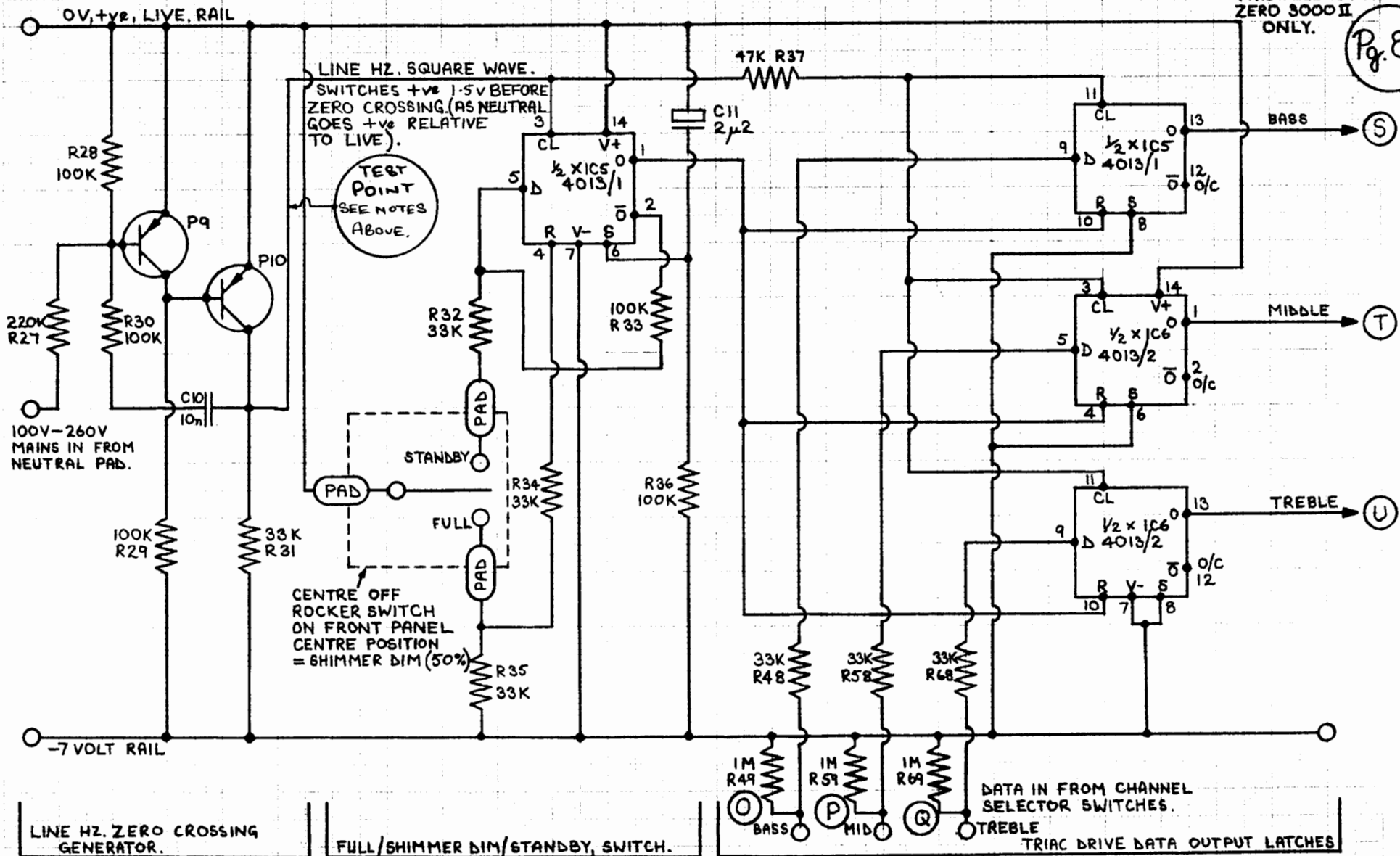
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ZERO 3000CIRCUIT DIAGRAM.

29/10/80 RJM.

THIS PAGE IS FOR
ZERO 3000II
ONLY.

Pg. 8A

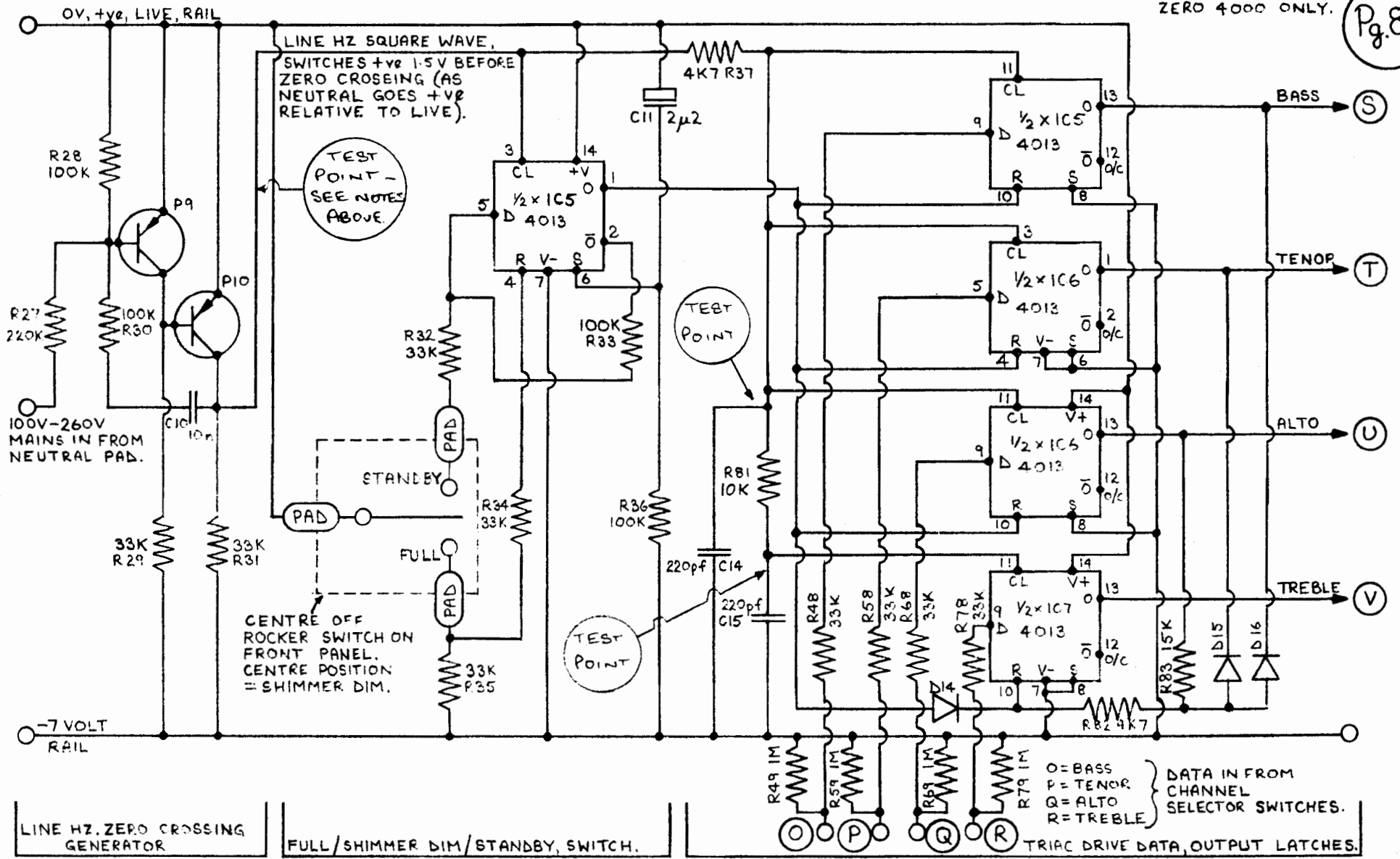


LINE HZ. ZERO CROSSING GENERATOR.

FULL/SHIMMER DIM/STANDBY SWITCH.

BASS (S)
MIDDLE (T)
TREBLE (U)

THIS PAGE IS FOR ZERO 4000 ONLY.



LINE HZ. ZERO CROSSING GENERATOR

FULL/SHIMMER DIM/STANDBY, SWITCH.

0 = BASS
 P = TENOR
 Q = ALTO
 R = TREBLE

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ZERO 3000II AND ZERO 4000 CIRCUIT DIAGRAM.

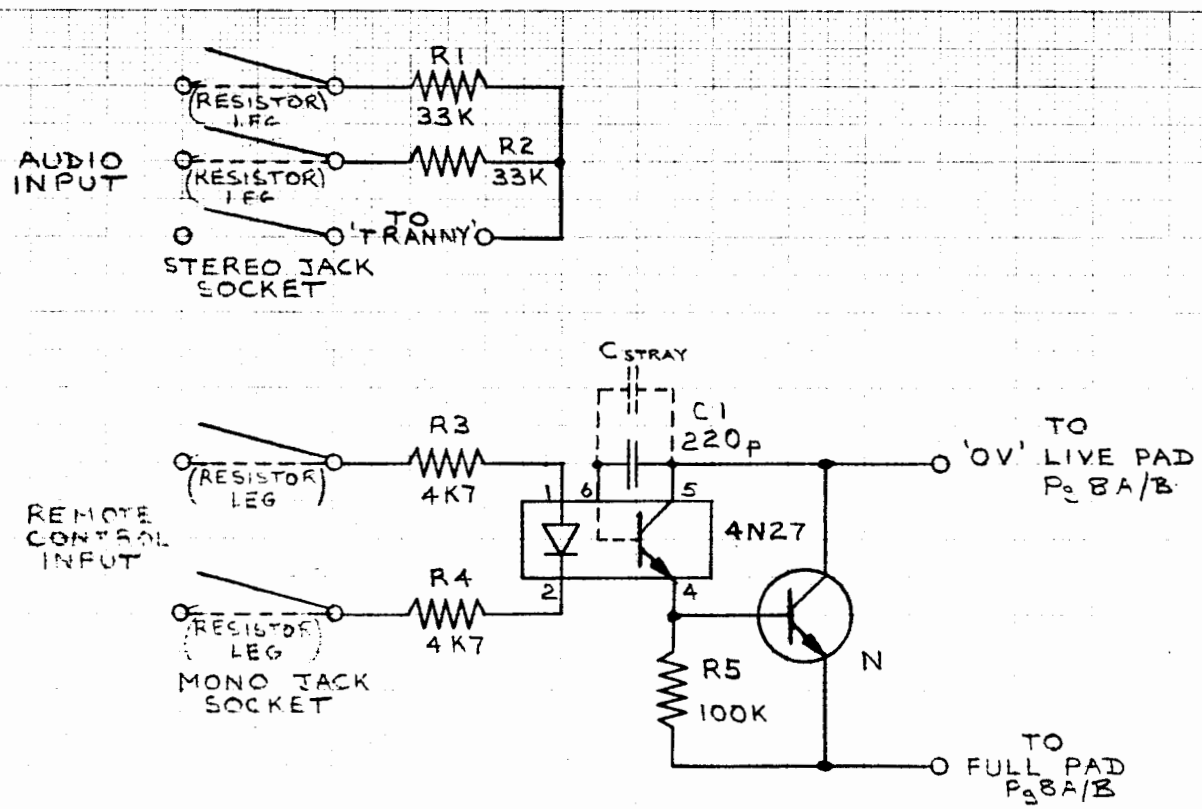
5/11/80 R.J.M.

Ⓢ 9.

No.	VALUE IN 3000. Pg.	VALUE IN 4000. Pg.	NOTES.
RESISTORS.			
R1	22K 2	22K 2	-30V RAIL DROPPER.
R2	47K 3	47K 3	LOG AUDIO AMP. R IN
R3	1M 3	1M 3	FEEDBACK
R4	47K 3	47K 3	P1 LOAD
R5	1K 3	1K 3	P2/N1 PROTECTION
R6	15K 3	15K 3	SETS QUIESCENT CURRENT
R7	15K 3	15K 2	BASS FILTER
R8	15K 3	15K 2	MIDDLE FILTER
R9	10K 3	15K 2	TREBLE FILTER
R10	1K 4	1K 4	G RAIL LOAD
R11	22K 4	22K 4	Z1 CURRENT SUPPLY
R12	4K7 4	4K7 4	P3 COLLECTOR LOAD
R13	6K8 4	6K8 4	LIMIT MAX SPEED
R14	1MRL4 4	1MRL4 4	SPEED CONTROL
R15	4K7 4	4K7 4	P8 TURN OFF
R16	47R 4	47R 4	LIMITS RESET CURRENT
R17	22K 4	22K 4	N3 TURN OFF DURING RESET
R18	220K 5	220K 5	INPUT PULL DOWN
R19	220K 5	220K 5	INPUT PROTECTION AND FILTERING.
R20	33K 5	33K 5	INPUT PULL DOWN
R21	33K 5	33K 5	INPUT PROTECTION
R22	10K 5	10K 5	SWAMP CURRENT FOR CONSTANT SPEED
R23	33K 6A	33K 6B	DATA FEEDBACK
R24	1K 4	1K 4	P8 COLLECTOR LOAD
R25	33K 6A	33K 6B	ALLOW SIGNAL THROUGH FOR FORWARD-BYPASS FOR REVERSE.
R26	33K 6A	33K 6B	
R27	220K 8A	220K 8B	MAINS SIGNAL IN
R28	100K 8A	100K 8B	ADVANCED SQ. WAVE
R29	100K 8A	33K 8B	PA COLLECTOR LOAD
R30	100K 8A	100K 8B	HYSTERESIS FOR MAINS SPIKE IMMUNITY
R31	33K 8A	33K 8B	PI0 COLLECTOR LOAD

No.	VALUE IN 3000. Pg.	VALUE IN 4000. Pg.	NOTES.
R32	33K 8A	33K 8B	INPUT PROTECTION
R33	100K 8A	100K 8B	DATA FEEDBACK
R34	33K 8A	33K 8B	INPUT PROTECTION
R35	33K 8A	33K 8B	INPUT PULL DOWN
R36	100K 8A	100K 8B	C11 CHARGE DOWN.
R37	47K 8A	4K7 8B	SQ. WAVE DELAY.
R40	33K 7	33K 7	PA TURN OFF
R41	22K 7	22K 7	PA INPUT
R42	22K 7	33K 7	PA COLLECTOR LOAD
R43	220K 7	220K 7	A.G.C. CURRENT
R44	1K 7	1K 7	N4 PROTECTION
R45	1K 5	1K 5	NH4 BASE DRIVE
R46	47R 5	47R 5	SETS GATE CURRENT
R47	47R 5	47R 5	SNUBBER NETWORK
R48	33K 8A	33K 8B	INPUT PROTECTION
R49	1M 8A	1M 8B	INPUT PULL DOWN
R50	33K 7	33K 7	P5 TURN OFF
R51	22K 7	22K 7	P5 INPUT
R52	22K 7	33K 7	P5 COLLECTOR LOAD
R53	220K 7	220K 7	A.G.C. CURRENT
R54	1K 7	1K 7	N5 PROTECTION
R55	1K 5	1K 5	NH5 BASE DRIVE
R56	47R 5	47R 5	SETS GATE CURRENT
R57	47R 5	47R 5	SNUBBER NETWORK
R58	33K 8A	33K 8B	INPUT PROTECTION
R59	1M 8A	1M 8B	INPUT PULL DOWN
R60	33K 7	33K 7	P6 TURN OFF
R61	22K 7	22K 7	P6 INPUT
R62	22K 7	33K 7	P6 COLLECTOR LOAD
R63	220K 7	220K 7	A.G.C. CURRENT
R64	1K 7	1K 7	N6 PROTECTION
R65	1K 5	1K 5	NH6 BASE DRIVE

No.	VALUE IN 3000. Pg.	VALUE IN 4000. Pg.	NOTES.
R66	47R 5	47R 5	SETS GATE CURRENT
R67	47R 5	47R 5	SNUBBER NETWORK
R68	33K 8A	33K 8B	INPUT PROTECTION
R69	1M 8A	1M 8B	INPUT PULL DOWN
R70		33K 7	P7 TURN OFF
R71		22K 7	P7 INPUT
R72		33K 7	P7 COLLECTOR LOAD
R73		220K 7	A.G.C. CURRENT
R74		1K 7	N7 PROTECTION
R75		1K 5	NH7 BASE DRIVE
R76		47R 5	SETS GATE CURRENT
R77		47R 5	SNUBBER NETWORK
R78		33K 8B	INPUT PROTECTION
R79		1M 8B	INPUT PULL DOWN
R80		33K 6B	DATA FEEDBACK
R81		10K 8B	SQ. WAVE 2ND DELAY
R82		4K7 8B	RESET CIRCUIT FOR TREBLE IF OTHER
R83		15K 8B	3 CHANNELS ARE ON
SWITCHES			
SW1	2P6W 7	2P6W 7	} 2 POLE 6 WAY CHANNEL FUNCTION SELECTORS
SW2	» 7	» 7	
SW3	» 7	» 7	
SW4	» 7	» 7	
TRIACS			
TC1	TXAL 228B 5	TXAL 228B 5	400VOLT 8AMP
TC2	» 5	» 5	TO-220 PACKAGE
TC3	» 5	» 5	ISOLATED TAB
TC4		» 5	
TRANSFORMERS.			
TY1	PCB MAINS TRANNY. 1 OFF IN Z3000 & Z4000		
TY2	AUDIO ISOLATING TRANNY. 1 OFF IN 3000 & 4000.		



AS USED ON ZERO 3000 II AND ZERO 4000

CAPACITORS.				SEMI-CONDUCTORS				SEMI-CONDUCTORS			
No.	VALUE IN 3000.	VALUE IN 4000.	NOTES.	No.	VALUE IN 3000.	VALUE IN 4000.	NOTES.	No.	VALUE IN 3000.	VALUE IN 4000.	NOTES.
	Py.	Py.			Py.	Py.			Py.	Py.	
C1	1000 μ _{10V}	2	1000 μ _{10V}	2	RAIL RESERVOIR	D1	IN4005	2	IN4005	2	RAIL RECTIFIERS
C2	4 μ 7	2	4 μ 7	2	-30V RAIL RESERVOIR	D2	"	2	"	2	} A.C.C. CURRENT SOURCE
C3	50n	3	1 μ	2	BASS FILTER	D3	"	2	"	2	
C4	2 μ 2	3	2 μ 2	2	D.C. BLOCKING.	D4	IN4148	3	IN4148	3	
C5	10n	3	20n	2	MIDDLE/TENOR FILTER	D5	"	3	"	3	} AUDIO LOGGING
C6	50n	3	20n	2	} TREBLE/ALTO FILTER	D6	"	4	"	4	
C7	10n	3	5n	2		D7	"	4	"	4	
C8	10n	3	5n	2	} RUN PULSE TIMING HYSTERESIS FOR MAINS SPIKE IMMUNITY	D8	"	6A	"	6B	} HOLD VOLTAGE 'G' IN 0.6-1.2V RANGE
C9	1 μ J	4	1 μ J	4		D9	"	6A	"	6B	
C10	10n	8A	10n	8B	LIGHTS OFF AT SWITCH ON	D10	"	4	"	4	
C11	2 μ 2	8A	2 μ 2	8B	SWITCH CONTACT DEBOUNCE	D11	"	"	"	6B	
C12	50n	5	50n	5	TREBLE FILTER	D12	"	"	"	6B	
C13			2n	2	FIRST SQ. WAVE DELAY	D13	"	"	"	6B	} AND GATE WITH R80 PART RESET 'OR' GATE
C14			220pf	8B	SECOND 80. WAVE DELAY	D14	"	"	"	8B	
C15			220pf	8B	MUSIC SMOOTHING	D15	"	"	"	8B	
C41	2 μ 2	7	2 μ 2	7	A.C.C.	D16	"	"	"	8B	} PART RESET 'AND' GATE.
C42	4 μ 7	7	4 μ 7	7	MUSIC SMOOTHING	D40	"	7	"	7	
C43	.047 μ X 250VAC	5	.047 X 250VAC	5	A.C.C.	D41	"	7	"	7	
C51	2 μ 2	7	2 μ 2	7	SNUBBER NETWORK	D50	"	7	"	7	} PEAK-PEAK DETECTION OF AUDIO BANDS
C52	4 μ 7	7	4 μ 7	7	MUSIC SMOOTHING	D51	"	7	"	7	
C53	.047 μ X 250VAC	5	.047 μ X 250VAC	5	A.C.C.	D60	"	7	"	7	
C61	2 μ 2	7	2 μ 2	7	SNUBBER NETWORK	D61	"	7	"	7	} STABILIZE RUN SPEED
C62	4 μ 7	7	4 μ 7	7	MUSIC SMOOTHING	D70	"	"	"	7	
C63	.047 μ X 250VAC	5	.047 μ X 250VAC	5	A.C.C.	D71	"	"	"	7	
C71			2 μ 2	7	SNUBBER NETWORK	Z1	BZY88 C3V9	4	BZY88 C3V9	4	} STABILIZE TRIAC GATE CURRENT
C72			4 μ 7	7	MUSIC SMOOTHING	Z4	"	5	"	5	
C73			.047 μ X 250VAC	5	A.C.C.	Z5	"	5	"	5	
C74			2n	6B	SNUBBER NETWORK	Z6	"	5	"	5	} AUDIO OUTPUT RESET TRIP WITH P3
C75	5n	5	5n	5	FALL DELAY.	Z7	"	"	"	5	
					SAKE REMOVAL	N1	NPN ⁸⁸ BC107	3	NPN ⁸⁸ BC107	3	
						N2	"	4	"	4	
N3	NPN ⁸⁸ BC107	4	NPN ⁸⁸ BC107	4	VOLTAGE CONTROLLED IS	N4	"	7	"	7	} A.C.C. CURRENT SOURCE
N5	"	7	"	7		N6	"	7	"	7	
N7	"	7	"	7		N7	"	7	"	7	
P1	PNP ⁸⁸ BC214	3	PNP ⁸⁸ BC214	3	AUDIO AMPLIFIER	P2	"	3	"	3	} AUDIO OUTPUT RESET SWITCH WITH N2
P3	"	3	"	3		P3	"	4	"	4	
P4	"	3	"	3		P4	"	7	"	7	
P5	"	4	"	4		P5	"	7	"	7	} DETECTED MUSIC AMPLIFIER
P6	"	7	"	7		P6	"	7	"	7	
P7	"	7	"	7		P7	"	7	"	7	
P8	"	7	"	7		P8	"	4	"	4	} OUT PUT + N3 TURN OFF ZERO CROSSING DETECT ZERO CROSSING OUTPUT
P9	"	7	"	7		P9	"	8A	"	8B	
P10	"	7	"	7		P10	"	8A	"	8B	
NH4	NPN ⁸⁸ BC184	5	NPN ⁸⁸ BC184	5	TRIA C GATE DRIVERS	NH5	"	5	"	5	} TRIAC GATE DRIVERS
NH6	"	5	"	5		NH6	"	5	"	5	
NH7	"	5	"	5		NH7	"	5	"	5	
IC1	1/2x4001	5	1/2x4001	5	SWITCH IN HOLD POSITION?	IC1	1/2x4001	5	1/2x4001	5	} SWITCH IN HOLD POSITION? CLOCK PULSE STOP
IC1	1/2x4001	5	1/2x4001	5		IC1	1/2x4001	5	1/2x4001	5	
IC2	4013	6A	4013	6B	CROSS COUPLED LATCH	IC2	4013	6A	4013	6B	
IC3	1/2x4016	6A	1/2x4016	6B	CHASE LATCHES	IC3	1/2x4016	6A	1/2x4016	6B	} FWD/REV SWITCHES
IC3	1/2x4016	6A	1/2x4016	6B		IC3	"	6A	"	6B	
IC3	"	6A	"	6B	LITE/DARK SWITCHES	IC3	"	6A	"	6B	
IC4	4024	6A	4024	6B	PROP. CHANGE COUNTER	IC4	4024	6A	4024	6B	} FULL/HALF/OFF CONTROL LATCH
IC5	1/2x4013	8A	1/2x4013	8B		IC5	1/2x4013	8A	1/2x4013	8B	
IC5	"	8A	"	8A	BASS OUTPUT DATA LATCH	IC5	"	8A	"	8A	
IC6	"	8A	"	8B	MIDDLE/TREBLE/ALTO DATA LATCH	IC6	"	8A	"	8B	} MIDDLE/TREBLE/ALTO DATA LATCH
IC6	"	8A	"	8B		IC6	"	8A	"	8B	
IC6	"	8A	"	8B	TREBLE/ALTO DATA LATCH	IC6	"	8A	"	8B	
IC7	"	8B	"	8B	TREBLE DATA LATCH	IC7	"	"	"	8B	} TREBLE DATA LATCH
IC7	"	8B	"	8B		IC7	"	"	"	8B	
IC7	"	8B	"	8B	CHASE LATCH	IC7	"	"	"	8B	