

SERVICE MANUAL

8050 • 8250

DUAL DISK DRIVES

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8050 • 8250 DISK DRIVES PRODUCT SPECIFICATIONS

GENERAL DESCRIPTION

The 8050 and 8250 are dual, 5-1/4 inch floppy disk drive units. The 8050 uses a 77 track, 100 TPI, single headed drive. The 8250 has double the amount of tracks, 154, with a 100 TPI double headed drive. They are intelligent devices containing their own microprocessors, RAM, ROM and operating system software.

MAXIMUM STORAGE

8050 — 1.05 Megabytes of data (formatted).
Free Blocks — 2052

8250 — 2.12 Megabytes of data (formatted).
Free Blocks — 4133

MEDIA

5-1/4 inch floppy disk.
8050 — single sided, double density
8250 — double sided, double density

INPUT/OUTPUT

IEEE Interface

CONTROLLERS

2 MOS 6502 microprocessors — 1 MHz clock

MEMORY

4K RAM, 16K ROM

DATA TRANSFER RATE

400 Bytes/sec

FILE TYPES

Program, sequential, relative, random-access and user

COMPUTERS

PET, 4000 series, 8000 series, B128

POWER REQUIREMENTS

120 Volts AC, 60Hz — integral power supply with external 1 Amp fuse

POWER CONSUMPTION

50 Watts maximum — 8050
60 Watts maximum — 8250

ASSEMBLY IDENTIFICATION

There have been 4 different drive assemblies used in the dual disk drive models 8050 and 8250. The various suppliers are listed, along with the respective PCB assemblies used in these units.

TYPE		DRIVE #	ANALOG #	DIGITAL #
Micropolis	8050	8050031-01	8050006-01 8250023-02	8050002-01
	8250	8250016-01	8250023-01	8050002-04
Microp Safari	8050	8250039-01	8250023-02	8050002-04
	8250	8250039-02	8250023-01	8050002-04
Tandon	8050	8050047-01	8050044-01	8050002-02
	8250	8250015-01	8050044-01	8050002-03
MPI	8050	8050059-01/02	8250023-03	8050002-05
	8250	8250029-01/02	8250023-03	8050002-06

Please note that the analog boards vary with the drive assembly but the digital board is the same PCB with ROM, CONTROLLER and JUMPER changes.

DOS/CONTROLLER ROMS FOR DIGITAL PCB #8050002

DESCRIPTION	PCB PART NO.	DOS CONTROLLER ROMS		
		UL1	UH1	UK3
2.5 Micropolis	8050002-01	901482-07	901482-06	901483-03
2.5 Tandon	8050002-02	901482-07	901482-06	901483-04
2.7 Tandon	**8050002-03	901887-01	901888-01	901884-01
2.7 Micropolis	**8050002-04	901887-01	901888-01	901885-04
2.7 MPI 8050	8050002-05	901887-01	901888-01	901869-01
2.7 MPI 8250	8050002-06	901887-01	901888-01	901869-01

* *Pcb part numbers 8050002-03 and -04 are stocked with the appropriate jumpers for use in an 8250. Before installing in an 8050, remove the two jumpers.

The 8250 jumper locations are illustrated on the PCB layout drawing on page 23.

ACCESSORY PARTS

REPLACEMENT CASEWORK FOR METAL UNITS IS NO LONGER AVAILABLE.

POWER CORD	C 903501-01
DEMO DISKETTE 8050	C 8050050-01
DEMO DISKETTE 8250	C 8250002-01
USER'S MANUAL	C 320899-01

INTERFACE CABLES:

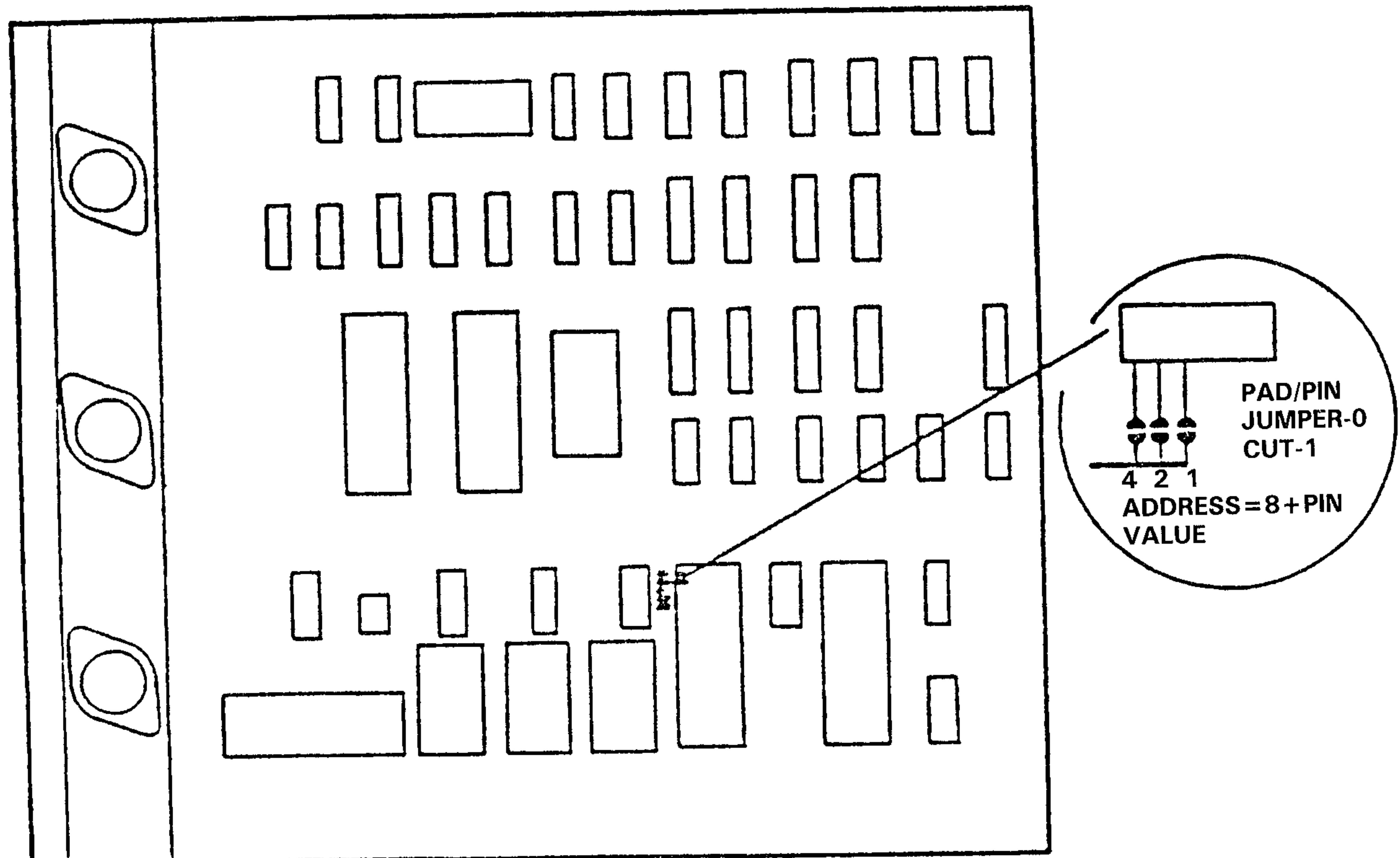
IEEE TO IEEE	C 905080-01
PET TO IEEE	C 320101-01
HARNESS ASSEMBLY POWER ANALOG	C 320814-01
RIBBON CONNECT CABLE	C 903000-01

THE 8050/8250 DEVICE NUMBER

The 8050/8250 disk drives have been assigned device #8 on the IEEE-488. However, it is possible for the digital board to be altered to select device numbers 8 thru 15.

At power-on reset, the three pins 22, 23 and 24 of the 6532 at location UE1 are read as a binary input. The factory supplied board has the pins tied to ground, so the inputs will read as binary 0's. By lifting one or a combination of pins, this input can be altered. The corresponding input will read as a binary 1 and is added to the base device number of 8 to derive the final device number. All subsequent communications will use this computed device number.

To compute the desired device number consider that pin 24 is the least significant bit and pin 22 is the most significant bit. For example, to select device #9, pin 24 would be cut and the input would be read as $8 + 1 = 9$. Lifting the remaining pins or combinations of pins will result in the additional device number selections.



DEVICE CHANGE PIN LOCATION

CARE AND MAINTENANCE

- DO NOT use MAGNETIZED tools when repairing or adjusting a disk drive.
- DO NOT place a disk drive near any device which generates "noise" e.g., — motors, radios, televisions.
- DO NOT stack drives upon each other or in any way inhibit air flow around the unit. HEAT BUILD-UP can cause disk failures.
- Periodically CLEAN the read/write head with 90% isopropyl alcohol and a cotton swab. CHECK load pad for excess wear. Clean or replace as necessary.
- Take the following precautions when handling a diskette:
 ALWAYS store a diskette in its jacket.
 Use ONLY felt-tip pens when writing on the label of a diskette.
 Do not bend or physically damage a diskette.
 Do not place a diskette in the area of a magnetic field.
 Do not attempt to clean a diskette.
 Do not touch the exposed area of a diskette.

DIAGNOSTIC and ADJUSTMENT procedures are outlined in the diagnostic disk and manual package. Order Part #314052-01 Version 3.0 & 3.5 Diagnostic Package.

POWER UP DIAGNOSTIC FOR 8050/8250 FLASH CODE

On power up, the three LED's on the drive should blink. The drive LED's go off and the center Tri-State LED remains green. The system has a built in self diagnostic which can be read in the form of a flash code. In the event of a failure, the 3 LED's will blink in a repetitive sequence. The number of blinks between intervals will indicate the possible location of a failure.

ERROR INDICATIONS

NUMBER OF FLASHES	ERROR CAUSE	COMPONENT /LOCATION
1	Zero Page	6532 UC1,UE1
2	ROM \$E000-\$FFFF	2364 UL1
3	ROM \$C000-\$DFFFF	2364 UH1
4	Unused	
5	Zero Page	6530 UK3
		6502 UH3
6	Common RAM \$1000-\$13FF	2114 UC4,UC5
7	Common RAM \$2000-\$23FF	2114 UD4,UD5
8	Common RAM \$3000-\$33FF	2114 UE4,UE5
9	Common RAM \$4000-\$43FF	2114 UF4,UF5
10	Controller ROM	6530 UK3
		6502 UH3

If the LED's come on and stay on, the microprocessor UN1 is probably at fault.

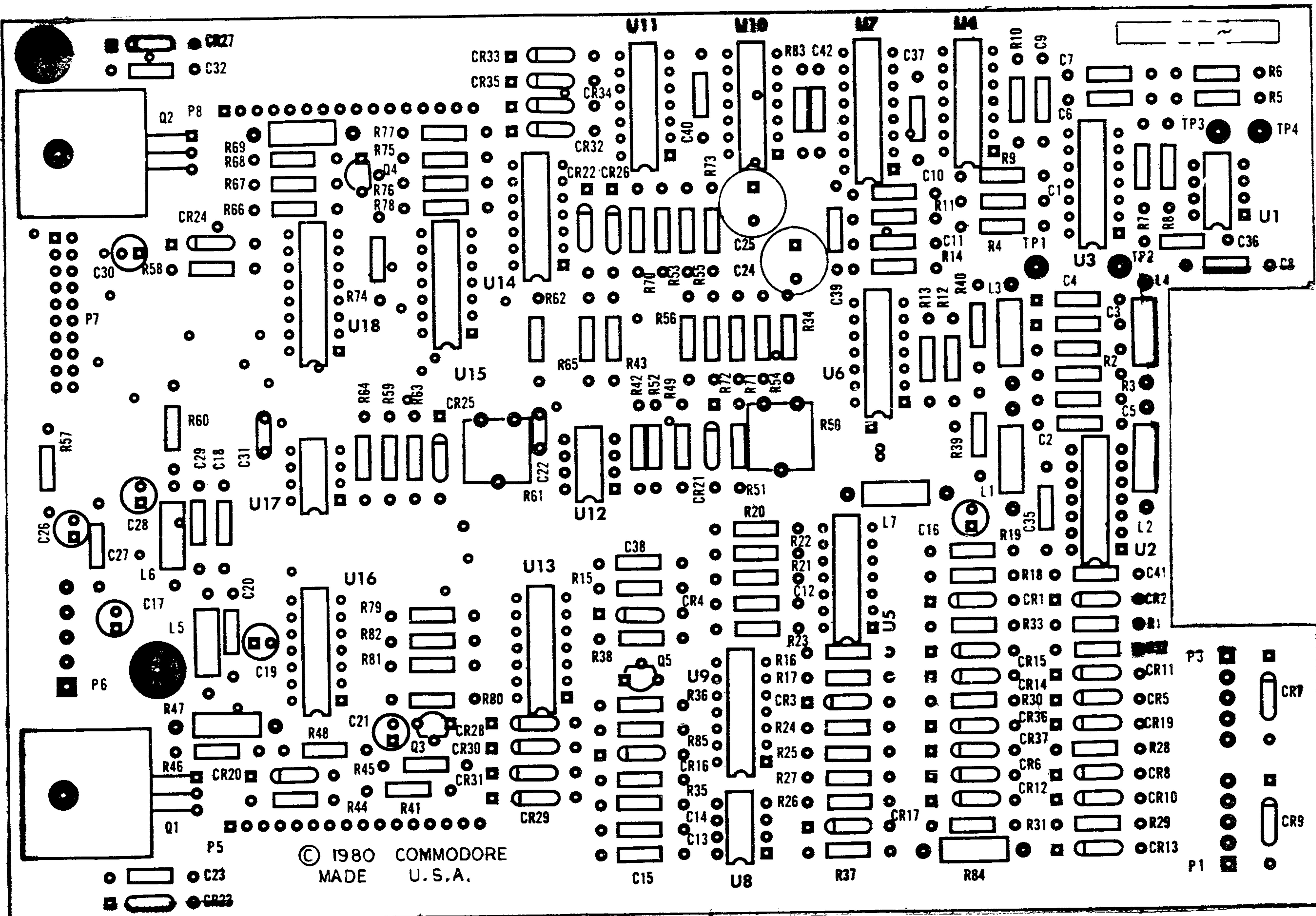
TROUBLESHOOTING GUIDE

NOTE: Always check for latest ROM/ECO upgrade, refer to schematic notes and ROM chart. If socketed IC is suspected bad, be sure to check socket with ohmmeter.

SYMPTOM:	POSSIBLE SOLUTION:
No LED's on power up.	Is Power cord plugged into wall outlet correctly? Is Power cord plugged into the disk drive correctly? Check line fuse. Check power switch. Check clock on 6502 pin 37. Check +5 and +12 volt lines.
Flash code.	See power-up diagnostic on page 5.
Device not present message appears.	Check for device number change. Check UA2 (7414) and the ATN line on the IEEE. Check UB1, UB2, UD2 (MC3446).
AC ripple in 5 or 12 volt lines.	Check power supply filter caps.
No reset pulse.	Check 555 and related components on digital board.
Motor won't run and head does not move.	Check UM3 (6522). Check UJ2 (741s00). Check +12 voltage sources.
One or both drive motors run continuously.	Check +12V. Check UH3, 6522 and logic gates. Check ROMs.
Loads programs with red error LED flashing.	Check drive speed. Check stepper motor. Check drive alignment. Check controller ROM UK3.
Loading is intermittent.	Check ROMs. Check drive speed. Check drive alignment.
Does not load when hot.	Check ROMs.
Locks-up when loading.	Check IEEE components. Check ROMs.
Message of 'FILE NOT FOUND' is displayed.	Clean drive head w/alcohol. Check read circuits. Check alignment.
Drive fails to read.	Check the 311, 9602, 592's, etc. on analog board. Check stepper and drive motors.

TROUBLESHOOTING GUIDE (Continued)

SYMPTOM:	POSSIBLE SOLUTION:
When loading a program, the time is excessive and stepper motor is heard (bump sound) a number of times.	Check that the diskette is centered properly. Check drive speed. Check drive alignment.
Data file error.	Check GCR ROM UK6.
Appears to load but won't run.	Check 6532's. Check UK3 controller ROM.
Won't format/write.	Check write protect tab in disk and switch on drive. Check write circuitry on analog board. Check write enable on digital board.



BOARD LAYOUT
PCB ASSEMBLY #8050006

PARTS LIST


PCB ASSEMBLY #8050006

PLEASE NOTE:

Commodore part numbers are provided for reference only and do not indicate the availability of parts from Commodore. Industry standard parts (Resistors, Capacitors, Connectors) should be secured locally. Approved cross-references for TTL chips, Transistors, etc. are available in manual form through the Service Department, order part #314000-01. Unique or non-standard parts will be stocked by Commodore and are indicated on the parts list by a "C". Vendor Name and part number have been provided for your convenience in ordering custom or unique parts.

INTEGRATED CIRCUITS		RESISTORS (Continued)			
U1	311	R55	220	R67	1K
U2,3	592	R56	47K	R68	470
U4	74LS86	R57	1K	R69	1 1/2W, 5%
U5	Q2T2905 Trans Pk	R58	150K	R70,71	1K
U6	74LS74	R59	270	R72	47K
U7	9602	R60	10K	R73	220
U8	555	R61	5K Potentiometer	R74	1K
U9	7417	R62	10K	R75-82	750
U10	74LS14	R63	12K	R83	6.8K
U11	74LS32	R64	47K	R84	390 1/2W, 5%
U12	741	R65	1K	R85	180
U13,14	FPQ3724 Trans Pk	R66	470		
U14,16					
U17					
U18	74LS139				
TRANSISTORS		CAPACITORS			
Q1,2	TIP110	C1	CER	2200pF, 50V	
Q3,4,5	2N4400	C2	CER	750pF, 50V	
		C3,4	CER	.47μF, 50V	
		C5	CER	.1μF, 50V	
		C6,7	CER	.022μF, 50V	
		C8	CER	.330pF, 50V	
		C9	CER	470pF, 50V	
		C10	CER	150pF, 50V	
		C11	CER	470pF, 50V	
		C12	CER	.1μF, 50V	
		C13	CER	.047μF, 50V	
		C14,15	CER	.1μF, 50V	
		C16,17	TANT	3.3μF, 25V	
		C18	CER	.1μF, 50V	
		C19	TANT	3.3μF, 25V	
		C20	CER	.1μF, 50V	
		C21	TANT	3.3μF, 25V	
		C22	MONOLITHIC	.1μF, 50V	
		C23	CER	.1μF, 50V	
		C24,25	ELECT	220μF, 16V	
		C26	TANT	3.3μF, 25V	
		C27	CER	.1μF, 50V	
		C28	TANT	3.3μF, 25V	
		C29	CER	.1μF, 50V	
		C30	TANT	3.3μF, 25V	
		C31	MONOLITHIC	.1μF, 50V	
		C32	CER	.1μF, 50V	
		C35-40	CER	.1μF, 50V	
		C41	CER	.47μF, 50V	
		C42	CER	47pF, 50V	
MISCELLANEOUS					
R1	22K	R27	3.16K 1/4W, 1%	L1,2	RF Shielded Choke, 100μH
R2,3	150	R28-31	12K	L3,4	RF Shielded Choke, 27μH
R4	100	R32,33	27K	L5,6	RF Shielded Choke, 10μH
R5,6	470	R34	1K	L7	RF Shielded Choke, 100μH
R7,8	2.2K	R35	17.4K 1/4W, 1%	P1,3	Header, St. Post, 5 pin
R9	510	R36	6.19K 1/4W, 1%	P5	Header, Rt. Angle, 16 pin
R10	330	R37	12K	P6	Header, 5 pin, .156 center
R11	18K	R38	1K	P7	Header, Dual Row 20 pin, .1 center
R12,13	1K	R39,40	220	P8	Header, Rt. Angle, 16 pin
R14	330	R41	10K		
R15	270	R42	47K		
R16	1K	R43	1K		
R17	1.5K	R44	470		
R18	560	R45	1K		
R19	1K	R46	470		
R20	1.5K	R47	1 1/2W, 5%		
R21	1K	R48	150K		
R22	1.5K	R49	270		
R23	2.2K	R50	5K Potentiometer		
R24	22K	R51	10K		
R25	3.16K 1/4W, 1%	R52	12K		
R26	22K	R53,54	1K		

SCHEMATIC 8050005




2. ALL CAPACITOR VALUES ARE IN MICROFARADS
AND ARE 50 VDC.

1. ALL RESISTOR VALUES ARE IN OHMS $\pm 5\%$
ARE 1/4 WATT.

NOTES - UNLESS OTHERWISE SPECIFIED:

MICROPOLIS ANALOG PCB ASSEMBLY #8050006 SHEET 1 OF 3


SCHEMATIC 8050005



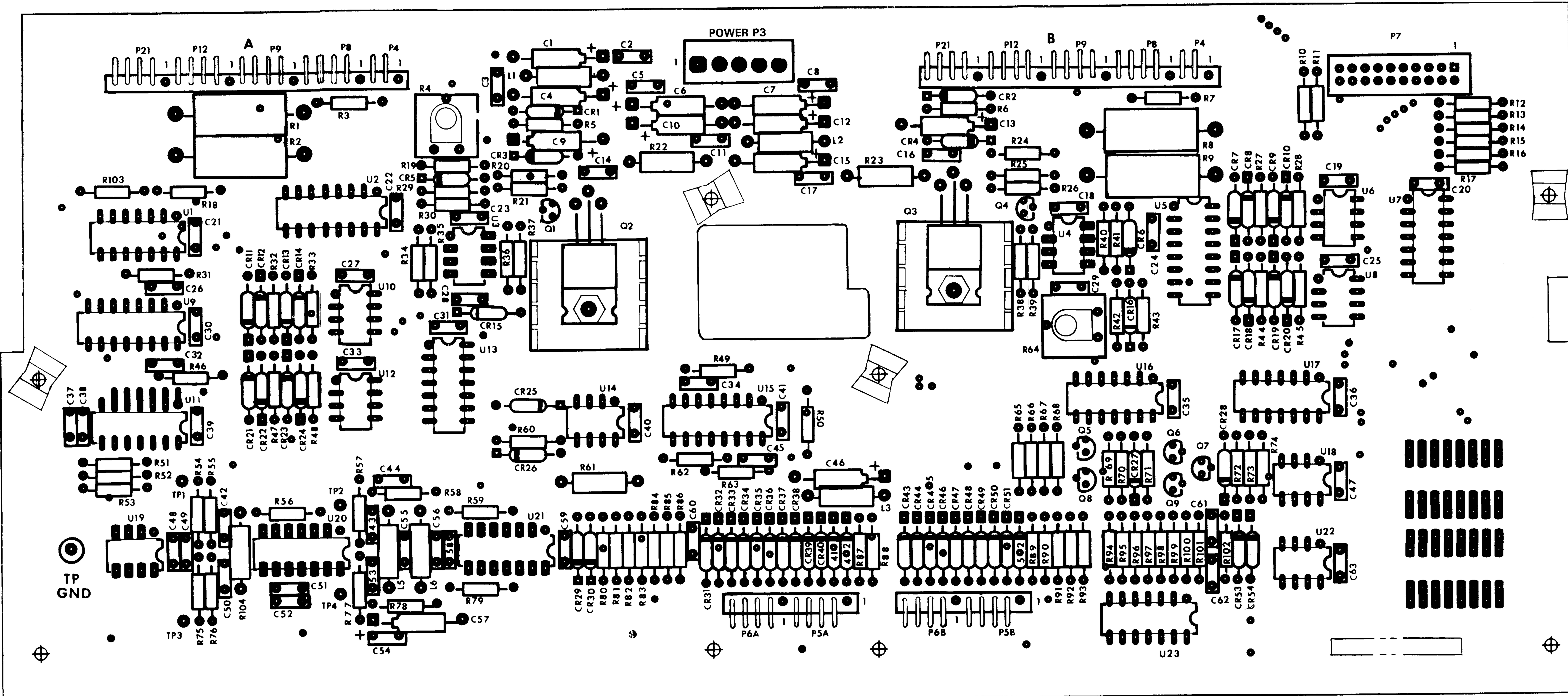
PIN #	IC #	GND
1	U1	P6-2
7	U4, 6, 9, 10, 11, 15, 16	P6-2
8	U7, 18	P6-2

NOT USED	
IC #	PINS
U9	5, 6, 8, 9, 10, 11, 12, 13
U10	8, 9
U11	1, 2, 3, 11, 12, 13

SCHEMATIC 8050005



BOARD LAYOUT
PCB ASSEMBLY #8050044



PARTS LIST

TANDON ANALOG

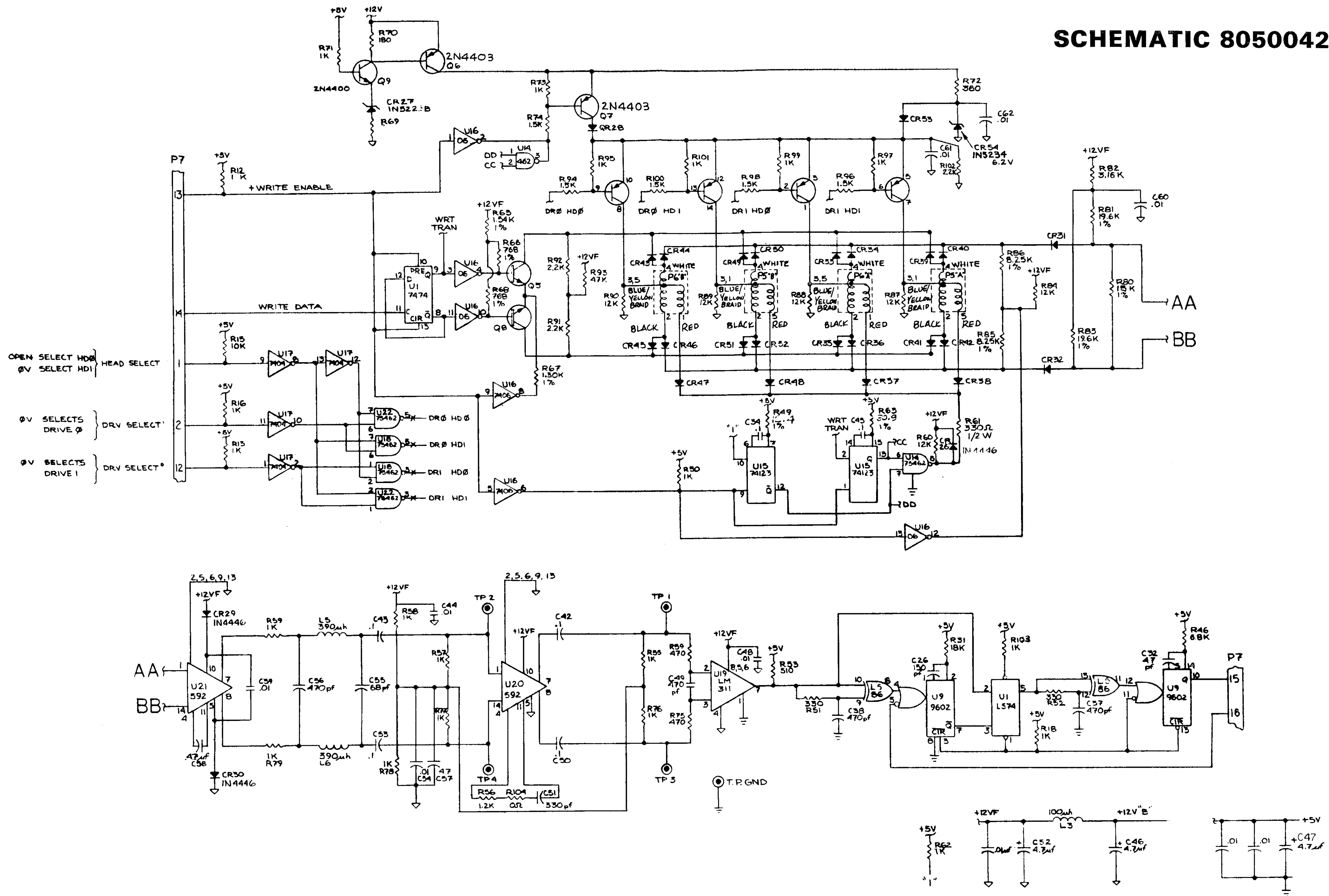
PCB ASSEMBLY #8050044

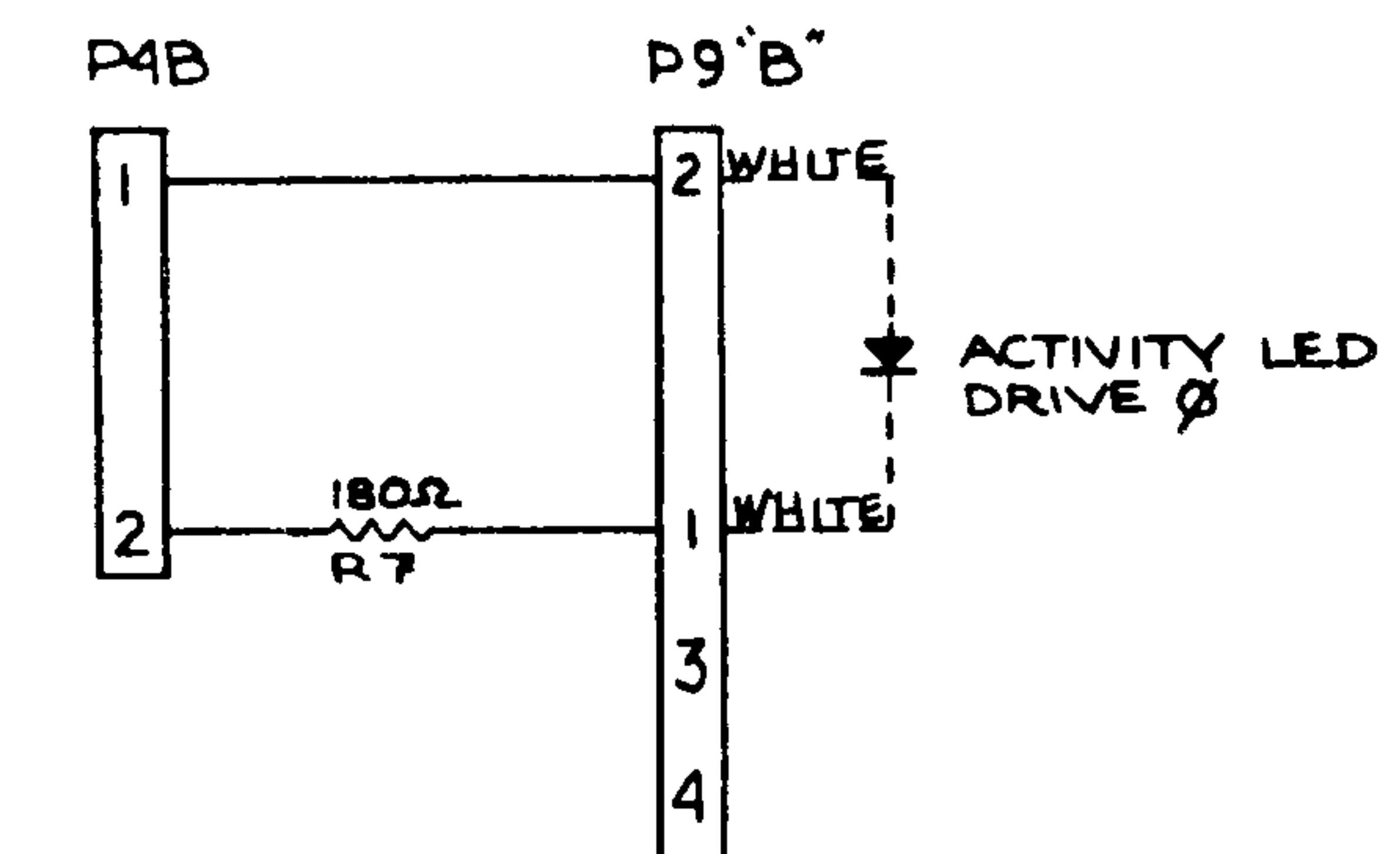
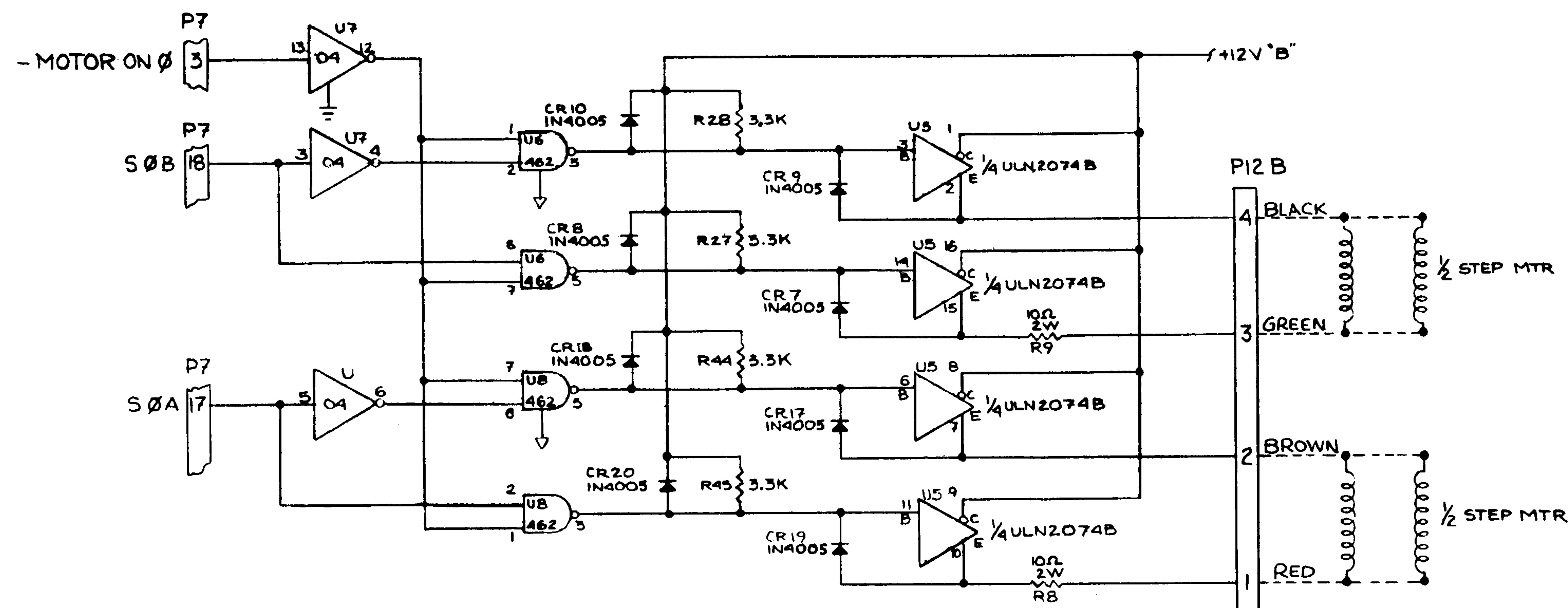
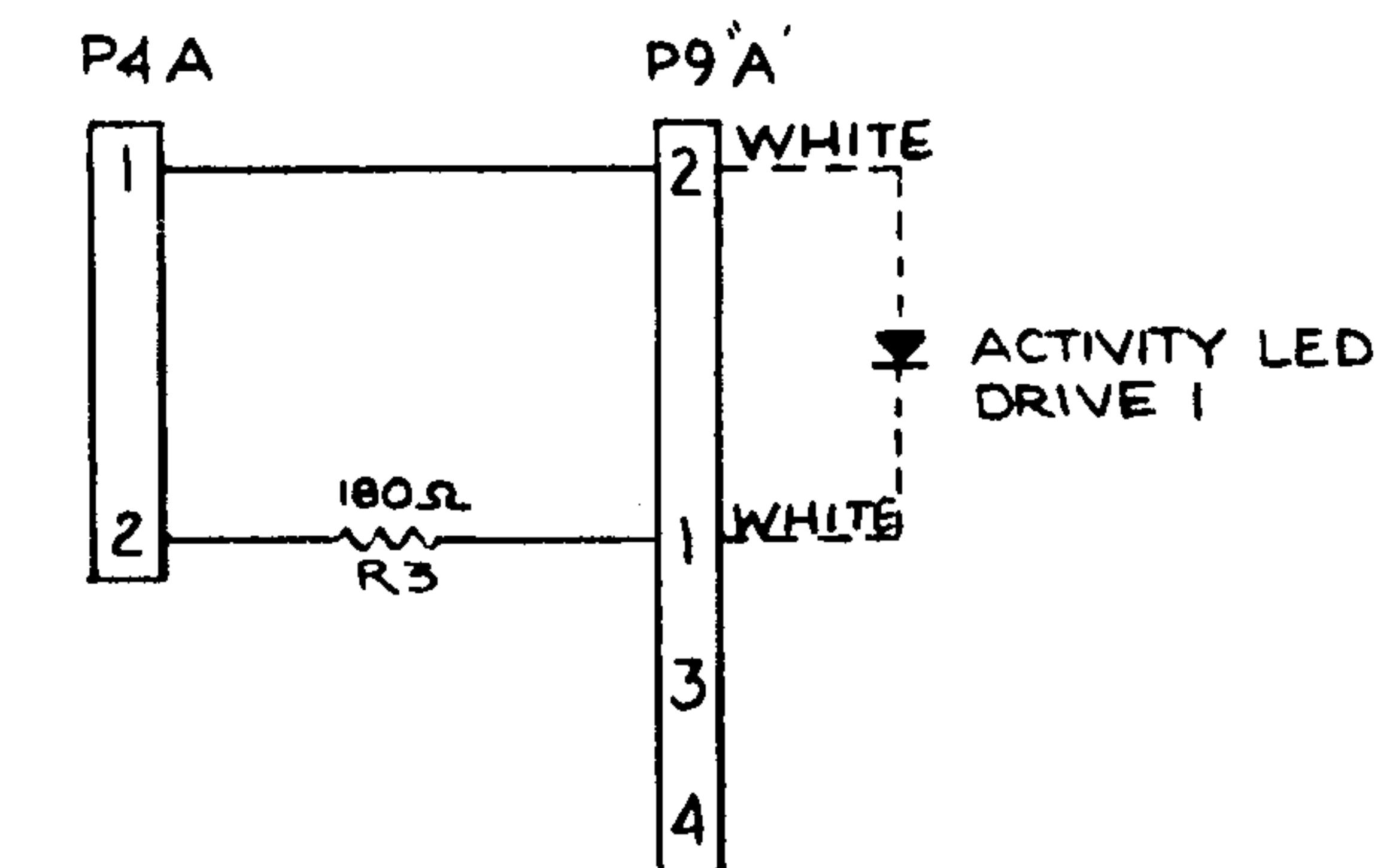
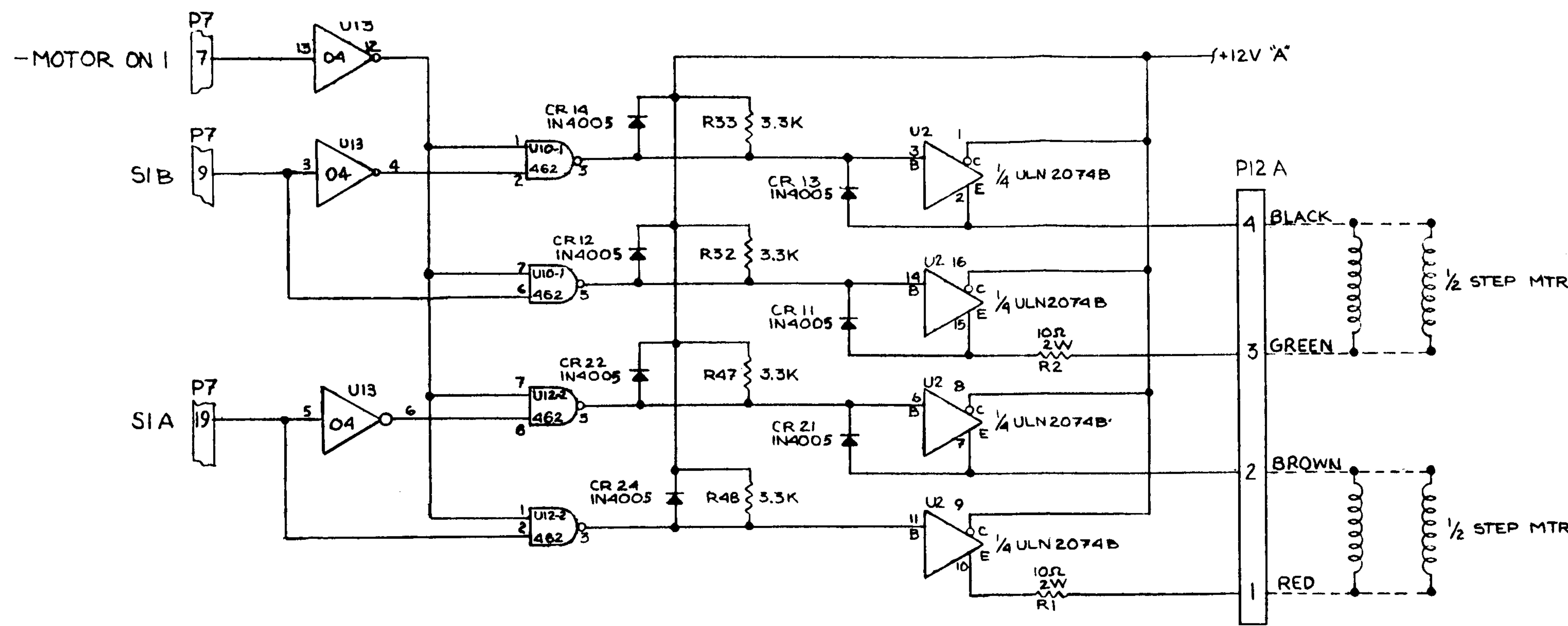
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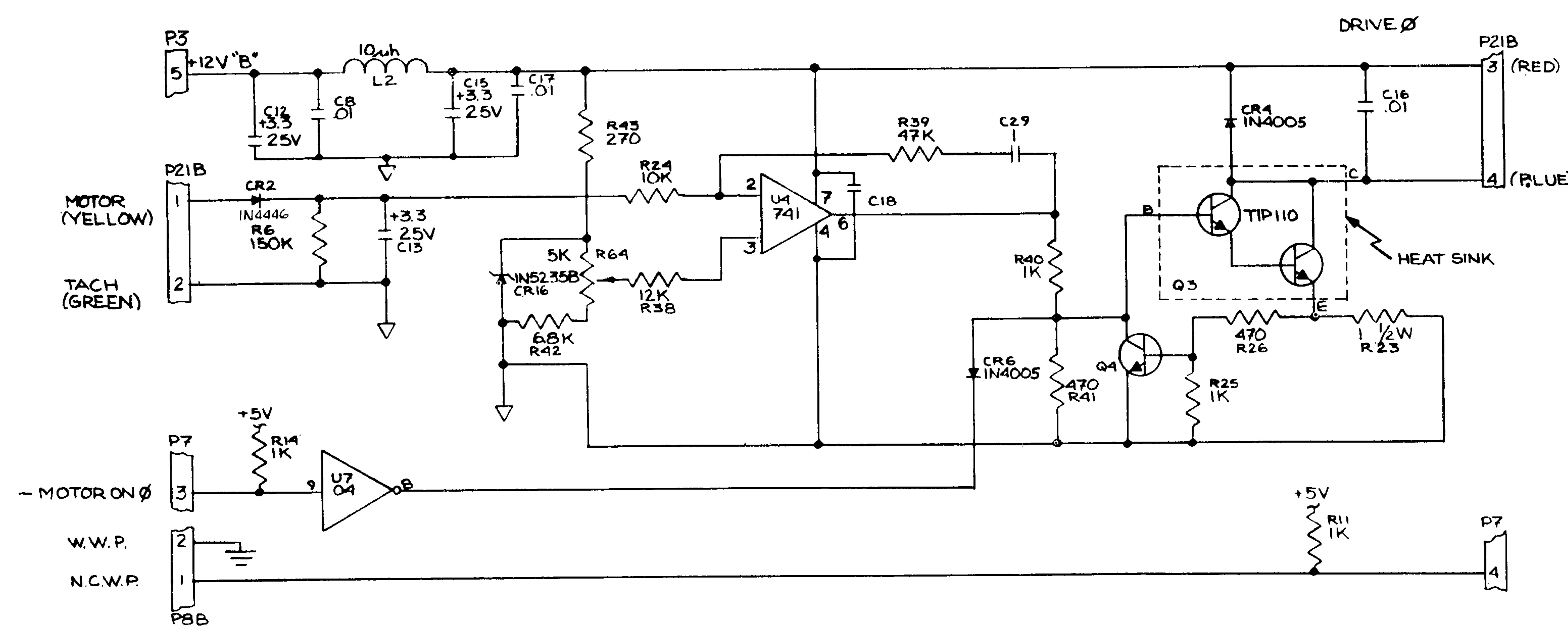
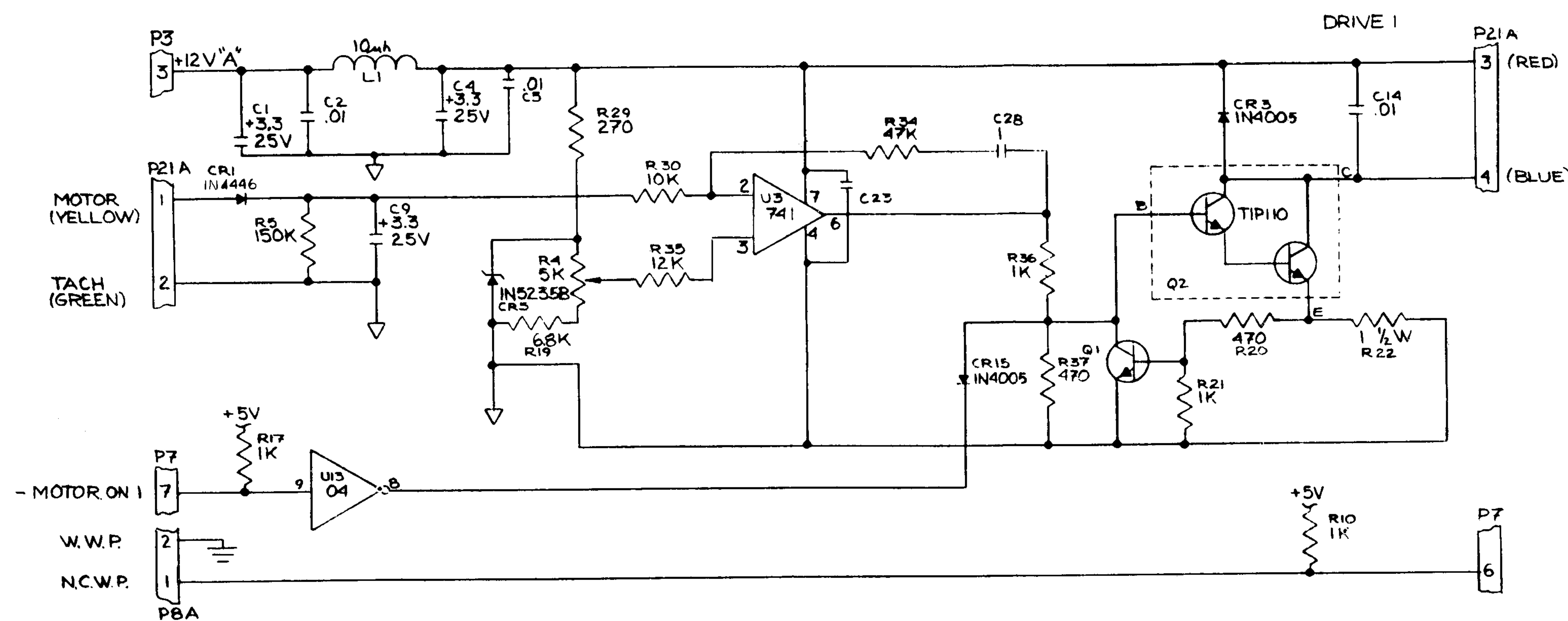
INTEGRATED CIRCUITS				RESISTORS (Continued)				
U1	74LS74			R60	12K		R82	3.16K 1/8W, 1%
U2	ULN2074 B Trans Pk			R61	330 1/2W, 5%		R83	19.6K 1/8W, 1%
U3,4	741 C			R62	1K		R84	12K
U5	ULN2074 B Trans Pk			R63	30.9K 1/8W, 1%		R85,86	8.25K 1/8W, 1%
U6	75462			R64	5K Potentiometer		R87-90	12K
U7	7404			R65	1.54K 1/8W, 1%		R91,92	2.2K
U8	75462			R66	768 1/8W, 1%		R93	47K
U9	9602			R67	1.3K 1/8W, 1%		R94	1.5K
U10	75462			R68	768 1/8W, 1%		R95	1K
U11	74LS86			R69	270		R96	1.5K
U12	77462			R70	180		R97	1K
U13	7404			R71	1K		R98	1.5K
U14	75462			R72	360		R99	1K
U15	74123			R73	1K		R100	1.5K
U16	7406			R74	1.5K		R101	1K
U17	7404			R75	470		R102	2.2K
U18	75462			R76-79	1K		R103	1K
U19	311			R80	15K		R104	BUSSWIRE
U20,21	592			R81	19.6K 1/8W, 1%			
U22	75462							
U23	Q2T2905 Trans Pk							
TRANSISTORS				CAPACITORS				
Q1	2N4400			C1	TANT	3.3μF,	15V	
Q2,3	TIP110			C2,3	CER	.01μF,	50V	
Q4,5	2N4400			C4	TANT	3.3μF,	15V	
Q6,7	2N4403			C5	CER	.01μF,	50V	
Q8,9	2N4400			C6,7	TANT	3.3μF,	15V	
DIODES				C8	CER	.01μF,	50V	
CR1,2	1N4446			C9,10	TANT	3.3μF,	15V	
CR3,4	1N4005			C11	CER	.01μF,	50V	
CR5	1N5235 B 6.8V Zener			C12,13	TANT	3.3μF,	15V	
CR6-15	1N4005			C14	CER	.01μF,	50V	
CR16	1N5235 B 6.8V Zener			C15	TANT	3.3μF,	15V	
CR17-24	1N4005			C16-25	CER	.01μF,	50V	
CR26	1N4446			C26	CER	150pF,	200V	
CR27	1N5226 B 3.3V Zener			C27	CER	.01μF,	50V	
CR28-53	1N4446			C28,29	CER	1μF,	50V	
CR54	1N5234 B 6.2V Zener			C30,31	CER	.01μF,	50V	
RESISTORS — All Values are in ohms- 1/4 W 5% unless noted otherwise.				C32	CER	47pF,	200V	
R1,2	10 2W, 5%			C33	CER	.01μF,	50V	
R3	180			C34	CER	.1μF,	50V	
R4	5K Potentiometer			35,36	CER	.01μF,	50V	
R5,6	150K			C37,38	CER	470pF,	200V	
R7	180			C39-41	CER	.01μF,	50V	
R8,9	10 2W, 5%			C42,43	CER	.1μF,	50V	
R10-14	1K			C44	CER	.01μF,	50V	
R15	10K			C45	CER	.1μF,	50V	
R16-18	1K			C46	TANT	4.7μF,	35V	
R19	6.8K			C47	TANT	4.7μF,	16V	
R20	470			C48	CER	.01μF,	50V	
R21	1K			C49	CER	470pF,	200V	
R22,23	1 1/2W, 5%			C50	CER	.1μF,	50V	
R24	10K			C51	CER	330pF,	200V	
R25	1K			C52	TANT	4.7μF,	16V	
R26	470			C53	CER	.1μF,	50V	
R27,28	3.3K			C54	CER	.01μF,	50V	
R29	270			C55	CER	68pF,	200V	
R30	10K			C56	CER	470pF,	200V	
R31	18K			C57	TANT	4.7μF,	35V	
R32,33	3.3K			C58	CER	.47μF,	50V	
				C59-63	CER	.01μF,	50V	
MISCELLANEOUS				L1,2	RF Shielded Choke,	10μH		
				L3	RF Shielded Choke,	100μH		
				L5,6	RF Shielded Choke,	390μH		
				P3	Header, 5 pin, .156 center			
				P5,6-A,B	Header, Rt. Angle, 10 pin			
				P4-21-A,B	Header, Rt. Angle, 23 pin			
				P7	Header, Dual Row, 20 pin, .1 center			
				P8	Header, Rt. Angle, 16 pin			

SCHEMATIC 8050042



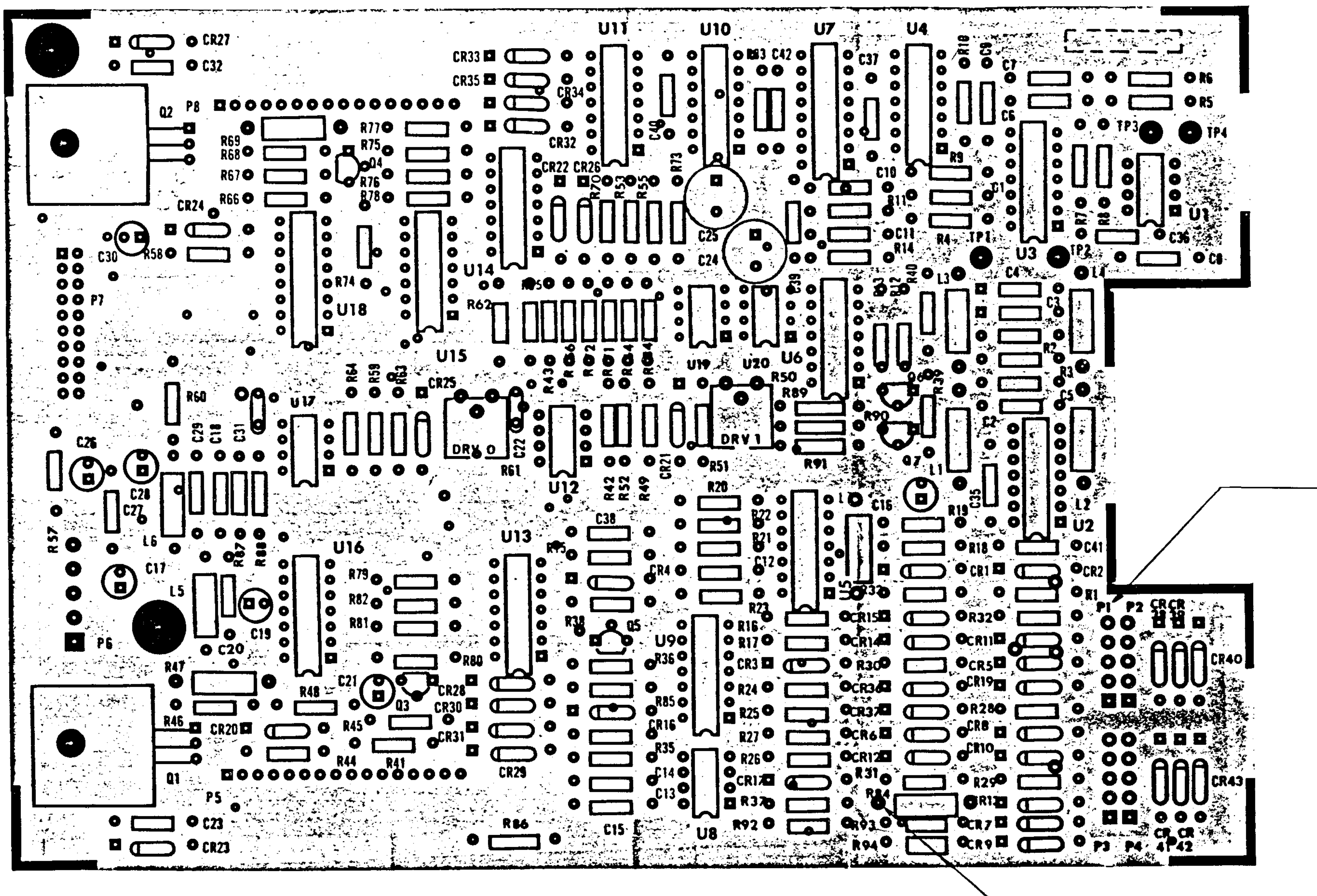


SCHMATIC 8050042



TANDON ANALOG PCB ASSEMBLY #8050044 SHEET 3 OF 3

**BOARD LAYOUT
PCB ASSEMBLY #8250023**



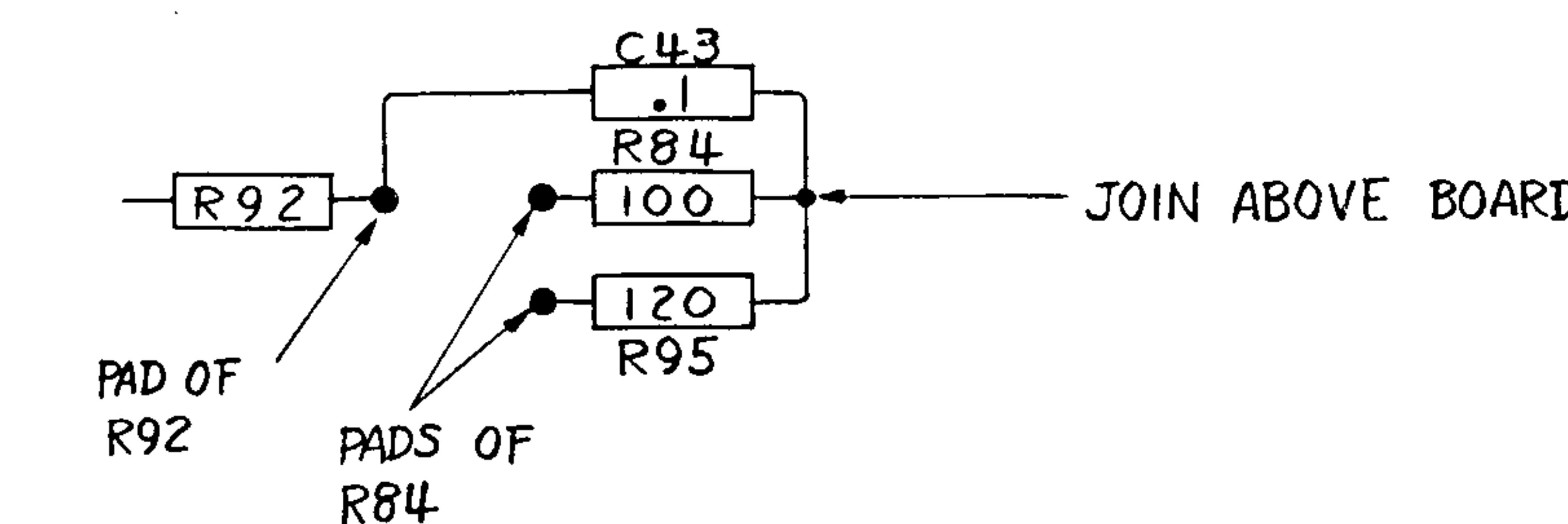
P1 – P4 PIN CONFIGURATIONS

		X indicates the header pin should be missing	P3	1X111	111X1	P1
		P4	11111	11111	P2	
8050	Micropolis and Micropolis Safari	DRV1	1X111	1X111	P1	
	MPI	11111	11111	11111	P2	
8250	Micropolis	R90	11111	11111	P1	
	Micropolis Safari	R91	11111	11111	P2	
	MPI	R92	1X111	1X111	P1	
		R93	1X111	1X111	P2	

THE FOLLOWING CIRCUIT CORRECTION SHOULD BE PRESENT ON ALL 8250023 BOARDS:

REMOVE R84 (220 Ω)

ADD 100 Ω (R84) AND 120 Ω (R95) AND CAP C43 AS BELOW:



PARTS LIST

MICROPOLIS/MPI ANALOG


PCB ASSEMBLY #8250023

PLEASE NOTE:

Commodore part numbers are provided for reference only and do not indicate the availability of parts from Commodore. Industry standard parts (Resistors, Capacitors, Connectors) should be secured locally. Approved cross-references for TTL chips, Transistors, etc. are available in manual form through the Service Department, order part #314000-01. Unique or non-standard parts will be stocked by Commodore and are indicated on the parts list by a "C". Vendor Name and part number have been provided for your convenience in ordering custom or unique parts.

INTEGRATED CIRCUITS		RESISTORS (Continued)			
U1	311	R52	12K	R69	1 1/2W, 5%
u2,3	592	R53,54	1K	R70,71	1K
U4	74LS86	R55	220	R72	47K
U5	Q2T2905 Trans Pk	R56	47K	R73	220
U6	74LS74	R57	1K	R74	1K
U7	9602	R58	150K	R75-82	750
U8	555	R59	270	R83	6.8K
U9	7417	R60	10K	R84	100
U10	74LS14	R61	5K Potentiometer	R85	180
U11	74LS32	R62	10K	R86-89	1K
U12	741	R63	12K	R90	1.5K
U13,14	FPQ3724 Trans Pk	R64	47K	R91	1K
U15,16	7406	R65	1K	R92	12K
U17	741	R66	470	R93	1.5K
U18	74LS139	R67	1K	R94	12K
U19,20	SN75453	R68	470	R95	120
TRANSISTORS		CAPACITORS			
Q1,2	Tip 110	C1	CER	2200pF,	50V
Q3,4,5	2N4400	C2	CER	750pF,	50V
Q6,7	2N4403	C3,4	CER	.47μF,	50V
DIODES		C5	CER	.1μF,	50V
CR1-3	1N4446	C6,7	CER	.022μF,	50V
CR4	1N5226 B 3.3V Zener	C8	CER	.330pF,	50V
CR5-20	1N4446	C9	CER	470pF,	50V
CR21	1N5235 B 6.8V Zener	C10	CER	150pF,	50V
CR22,23	1N4002	C11	CER	470pF,	50V
CR24	1N4446	C12	CER	.1μF,	50V
CR25	1N5235 B	C13	CER	.047μF,	50V
CR26,27	1N4002	C15	CER	.1μF,	50V
CR36-43	1N4446	C16,17	TANTALUM	3.3μF,	25V
RESISTORS — All Values are in ohms- 1/4 W 5% unless noted otherwise.		C18	CER	.1μF,	50V
R1	22K	C19	TANTALUM	3.3μF,	25V
R2,3	150	C20	CER	.1μF,	50V
R4	100	C21	TANT	3.3μF,	25V
R5,6	470	C22	MONOLITHIC	1μF,	50V
R7,8	2.2K	C23	CER	.1μF,	50V
R9	510	C24,25	ELECT	220μF,	16V
R10	330	C26	TANT	3.3μF,	25V
R11	18K	C27	CER	.1μF,	50V
R12,13	1K	C28	TANT	3.3μF,	25V
R14	330	C29	CER	.1μF,	50V
R15	270	C30	TANT	3.3μF,	25V
R16	1K	C31	MONOLITHIC	1μF,	50V
R17	1.5K	C32,35-40	CER	.1μF,	50V
R18	560	C41	CER	.47μF,	50V
R19	1K	C42	CER	47pF,	50V
R20	1.5K	C43	CER	.1μF,	50V
R21	1K	MISCELLANEOUS			
R22	1.5K	L1,2	RF Shielded Choke,	100μH	
R23	2.2K	L3,4	RF Shielded Choke,	27μH	
R24	22K	L5,6	RF Shielded Choke,	10μH	
R25	3.16K 1/4W, 1%	L7	RF Shielded Choke,	100μH	
		P1-4	Header, St. Post, 5 pin		
		P5	Header, Rt. Angle, 16 pin		
		P6	Header, 5 pin, .156 center		
		P7	Header, Dual Row, 20 pin, .1 center		
		P8	Header, Rt. Angle, 16 pin		


SCHEMATIC 8250022




3. ALL DIODES ARE IN4446.
2. ALL CAPACITOR VALUES ARE IN MICROFARADS
AND ARE 50 VDC.
1. ALL RESISTOR VALUES ARE IN OHMS $\pm 5\%$ &
ARE $1/8$ WATT

NOTES: UNLESS OTHERWISE SPECIFIED:

SCHEMATIC 8250022




SCHEMATIC 8250022

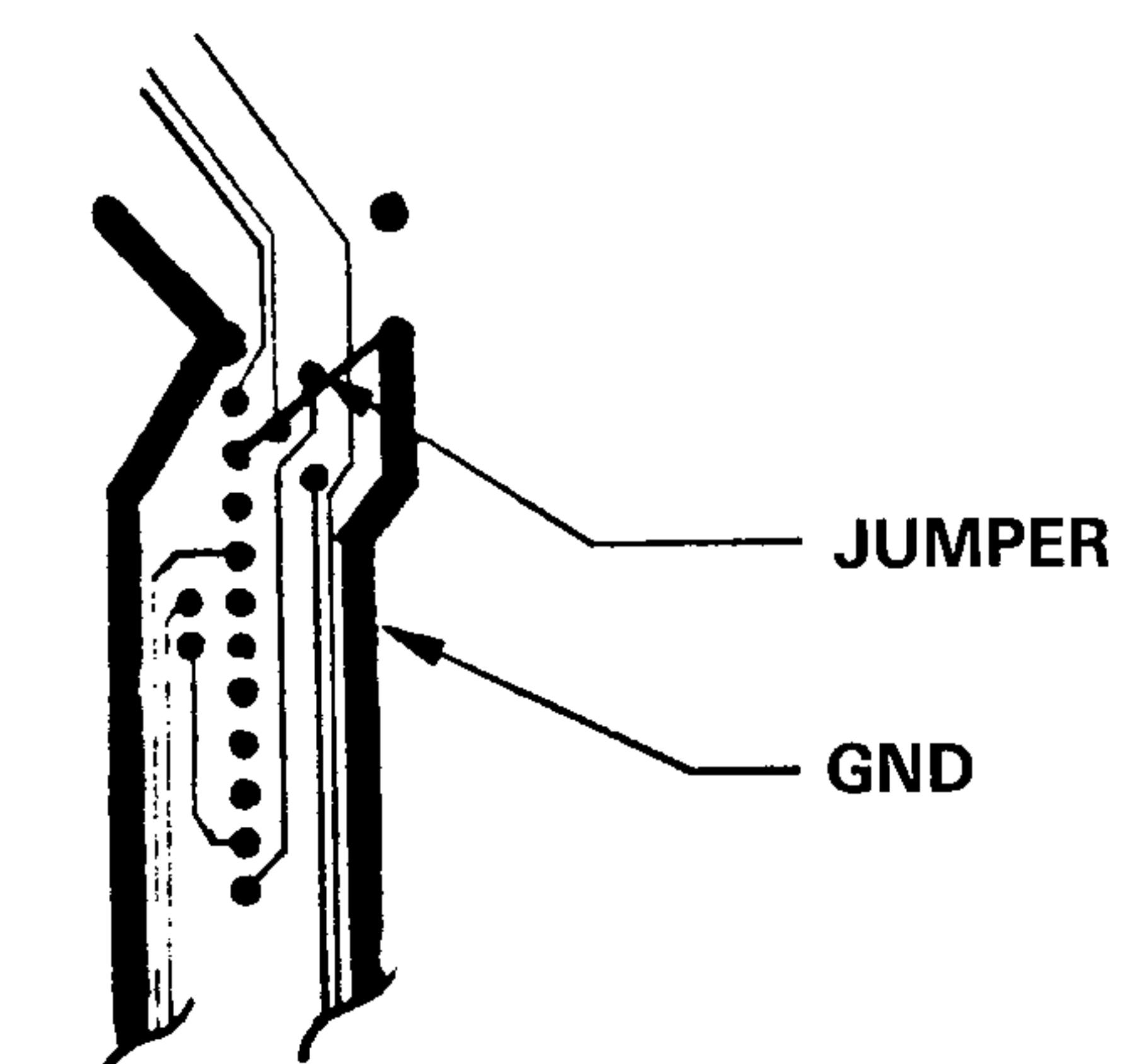


BOARD LAYOUT

PCB ASSEMBLY #8050002



DASH NO.	USED ON	JUMPER E3
-01	8050	OUT
-02	8050	OUT
-03	8250	IN
-04	8250	IN
-05	8050	OUT
-06	8250	IN



CIRCUIT SIDE VIEW OF UK3-18

FOR 8250 PCB ASSY'S ONLY, ADD A JUMPER WIRE ON THE CIRCUIT SIDE OF THE BOARD, BETWEEN UK3 PIN 18 & GND AND AT LOCATION E3 ON THE COMPONENT SIDE OF THE BOARD.

PARTS LIST

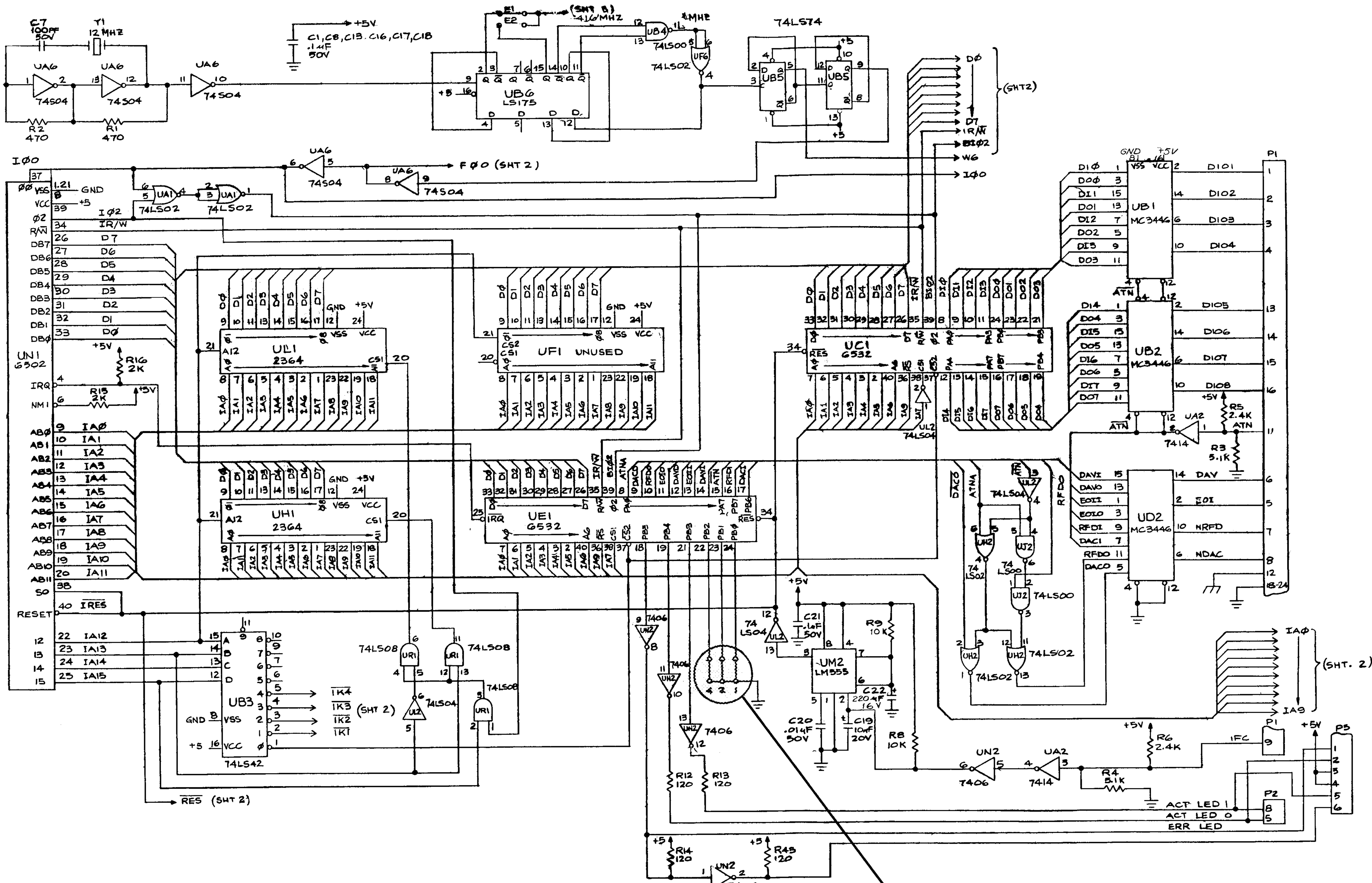
DIGITAL PCB ASSEMBLY #8050002

PLEASE NOTE:

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INTEGRATED CIRCUITS		DIODES			
UA1	74LS02	CR1	Bridge Rect KBL02		
UA2	7414	CR2	1N4148		
UA3	74LS42	CR5,6	1N5402 3A, 200V		
UA4	74LS194	CR7,8,9	1N4001 1A, 50V		
RESISTORS		RESISTORS			
UA5	74LS153	R1,2	470	R28	82K
UA6	74S04	R3,4	5.1K	R29	43K
UB1,2	3446	R5,6	2.4K	R30	7.15K 1/4W, 1%
UB3	74LS42	R7	2K	R32	2.2K
UB4	74LS00	R8,9	10K	R33	680
UB5	74LS74	R12,13,14	120	R35	2K
UB6	74LS175	R15,16	2K	R36	1K
UC1	6532 PIA	R17	226 1/4W, 1%	R37	2.2K
UC3	74LS157	R18	75 1/4W, 1%	R45	120
UC4,5	2114 RAM 300ns	R19	100 1/4W, 1%	R47	2.2K
UC6	74LS163	R20	1K	R48	680
UD2	3446	R21	2K	R49	10K
UD3	74LS157	R22	15K	R50	2.2K
UD4,5	2114 RAM 300ns	R23,24,25	10K	R51	200 1/4W, 1%
UD6	74LS00	R26	2.7K	R52,53	2K
UE1	6532 PIA	R27	33K		
CAPACITORS		CAPACITORS			
UE3	74LS157	C1-6	CER .1µF, 50V		
UE4,5	2114 RAM 300ns	C7	CER 100pF		
UE6	74LS04	C8-18	CER .1µF, 50V		
UF3	74LS157	C19	ELECT, LL 10µF, 25V		
UF4,5	2114 RAM 300ns	C20	CER .01µF		
UF6	74LS02	C21	CER .1µF, 50V		
UH1	ROM 2364	C22	ELECT 220µF, 16V		
UH2	74LS02	C23-28	CER .1µF, 50V		
UH3	6502 µ Processor	C29	ELECT, LL 1µF, 50V		
UH5	74190	C30	ELECT 10µF, 25V		
UH6	74LS00	C31	ELECT, LL 1µF, 50V		
UJ2	74LS00	C32	ELECT 10µF, 25V		
UJ5	74LS157	C33	ELECT, LL 1µF, 50V		
UK3	6530 PIA	C34	ELECT 47µF, 16V		
UK5	74LS157	C35-48	CER .1µF, 50V		
UK6	ROM 6316	C49	CER 47pF		
UL1	ROM 2364	C50	CER .1µF, 50V		
UL2	74LS04	C51	CER 200pF		
UL5	74LS157	C52,53	CER 330pF		
UM2	555	C55,56	CER .1µF, 50V		
UM3	6522 VIA	C58	CER 100pF		
UM5	74LS133	C59-66	CER .1µF, 50V		
UM6	74LS194	C67	CER 150pF		
UN1	6502 µ Processor	C68	CER 200pF, 250V		
UN3	353				
UN4	4066				
UN5	74LS164				
UN6	74LS165				
UP3	Q2T2222 Trans Pk				
UP5	74LS164				
UP6	74LS02				
UR1	74LS08				
TRANSISTORS		MISCELLANEOUS			
Q1	2N3904	VR1,2	7812 Voltage Regulator 12V, 1.5A		
Q2	2N3906	VR3	LM323 Voltage Reg 5V, 3A		
		L1	RF Shielded Choke, 100µH		
		Y1	12 MHz Crystal		
		P1	Cnct, Rt. Angle, IEEE		
		P2	Header, Dual, 20 pin, .1 center		
		P3	Header, 5 pin, .156 center		
		P4	Header, 3 pin, .156 center		
		P4	Header, 6 pin, .156 center		
		P5	Header, 6 pin, .1 center		

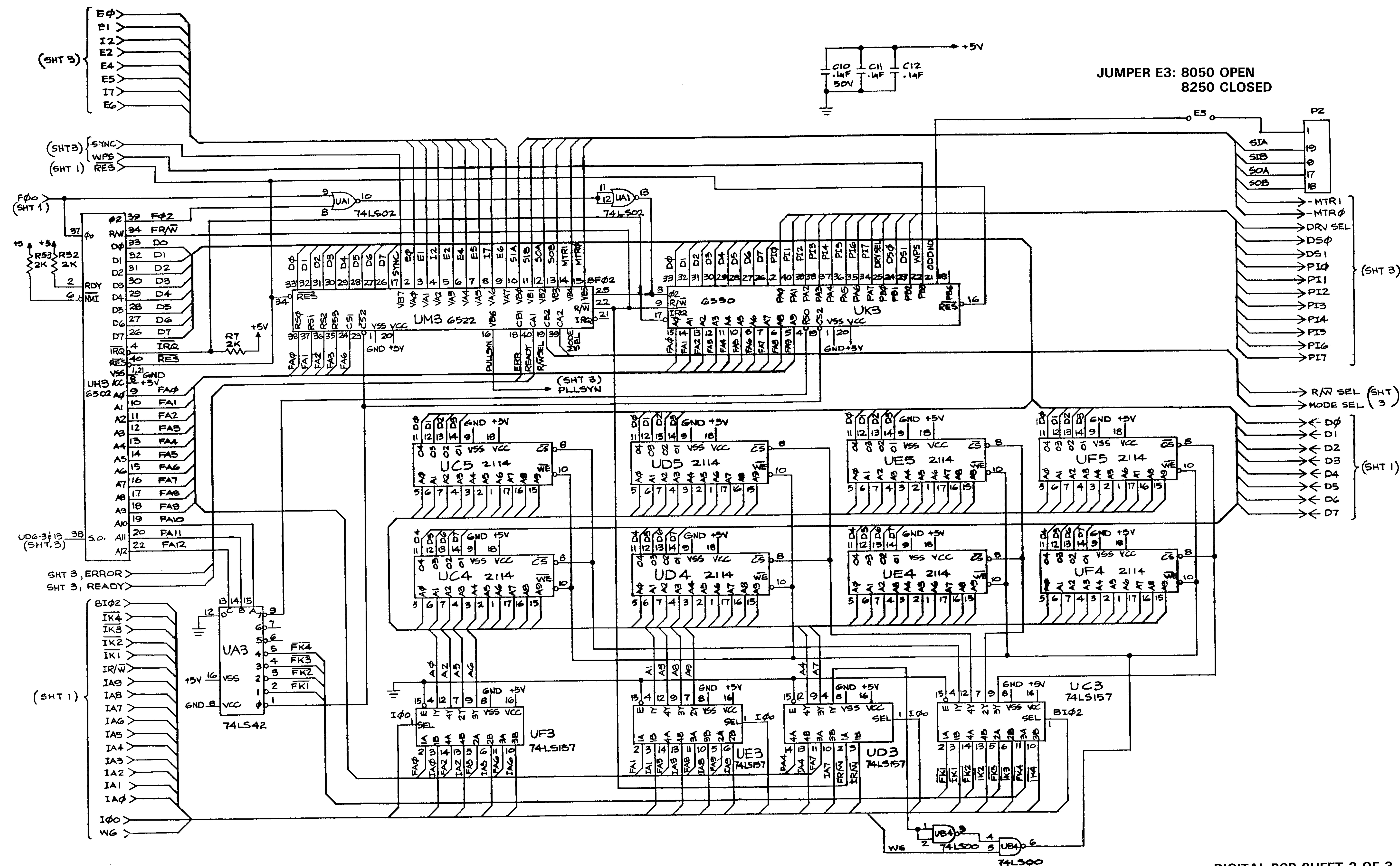
SCHEMATIC 8050001



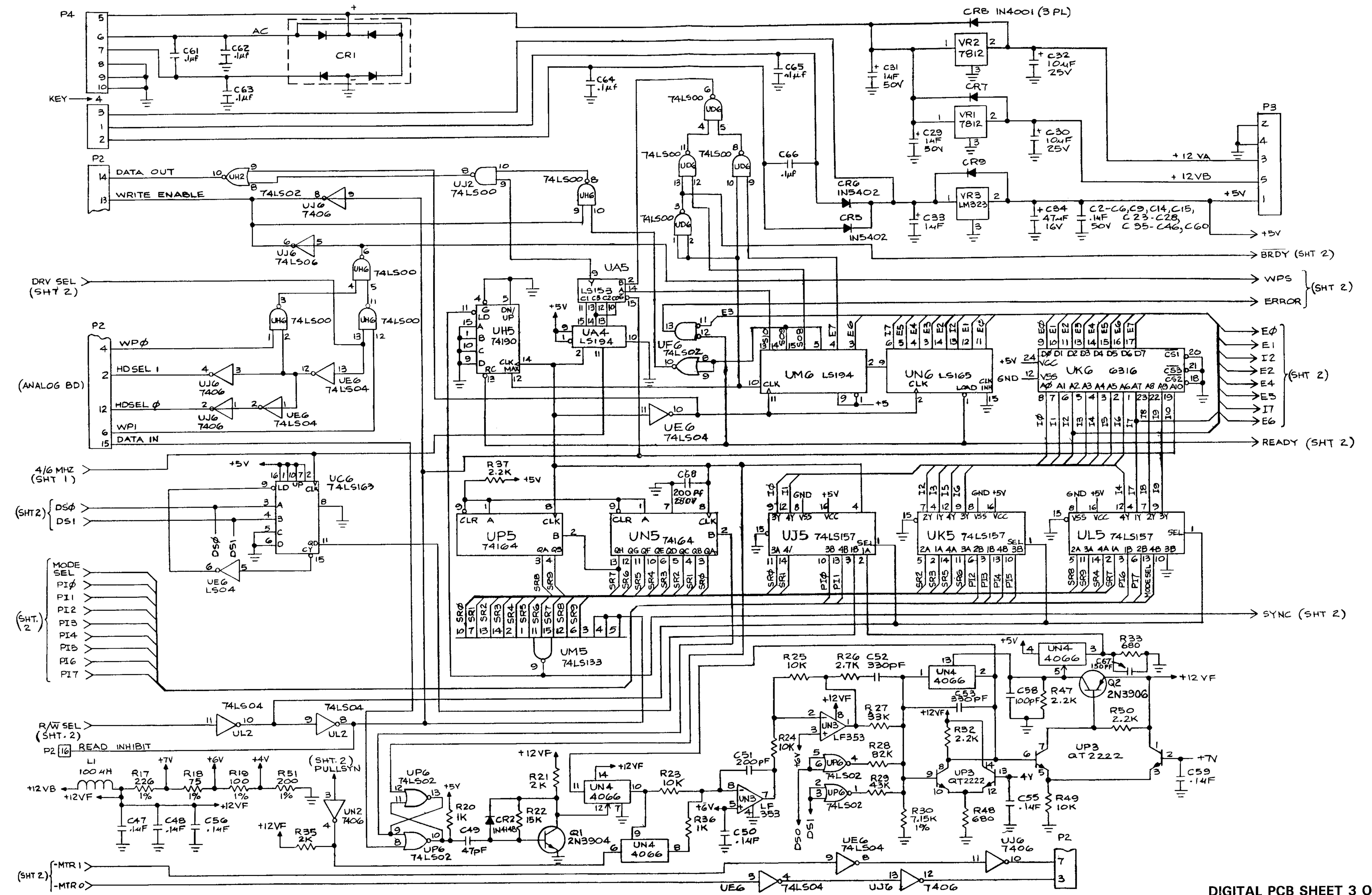
DEVICE NUMBER
SELECTION

DIGITAL PCB SHEET 1 OF 3


SCHMATIC 8050001



SCHMATIC 8050001

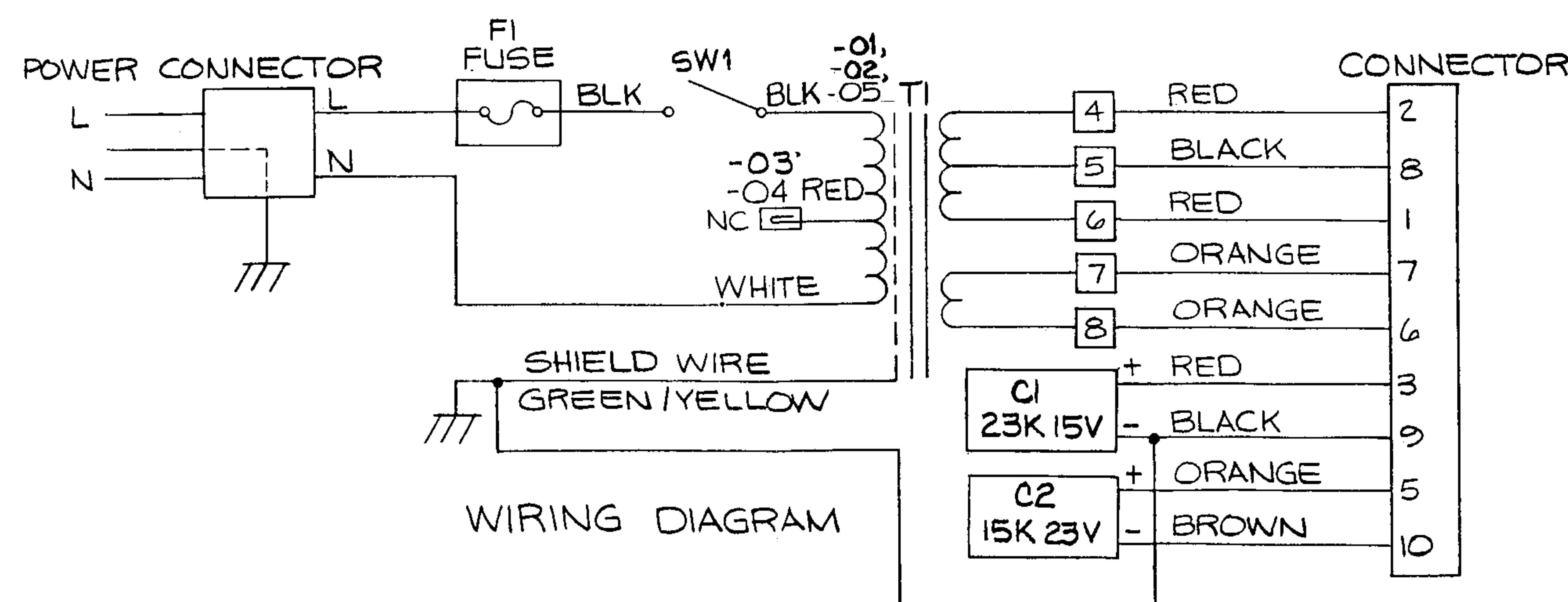
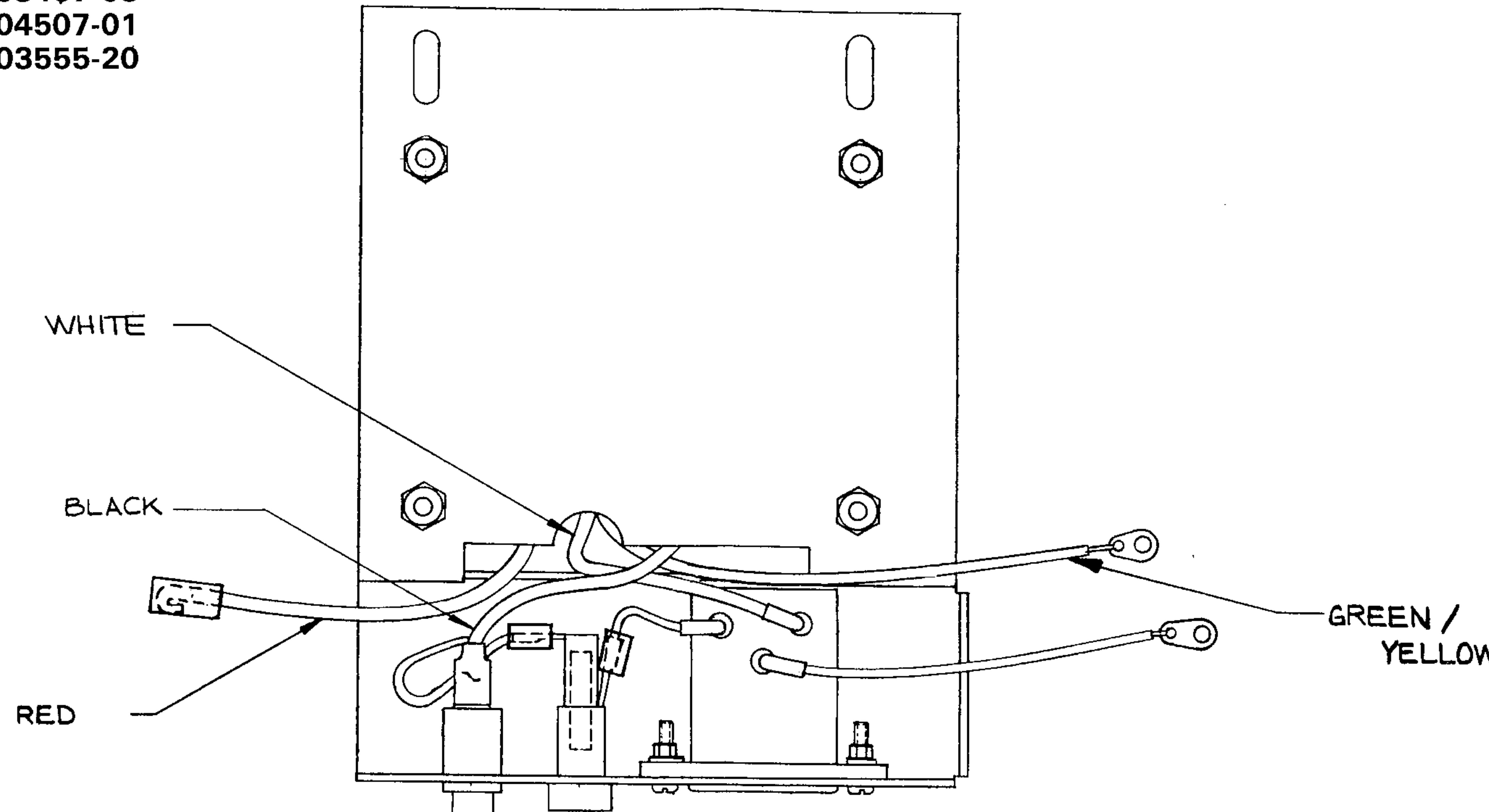


POWER SUPPLY ASSEMBLY #8050029



PARTS LIST

T1	TRANSFORMER	320085-02
P1	POWER FILTER CNNCT	903467-03
SW1	ROCKER SWITCH	904507-01
F1	FUSE 250V SLO-BLO 1.0A	903555-20
C1	ELECT. CAP, 23K MFD, 15V	
C2	ELECT. CAP, 13K MFD, 25V	

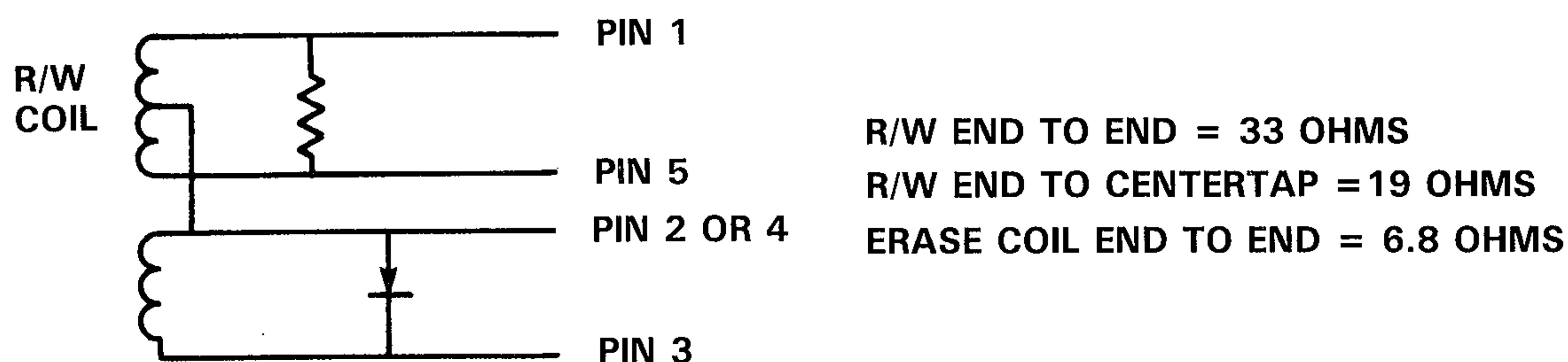
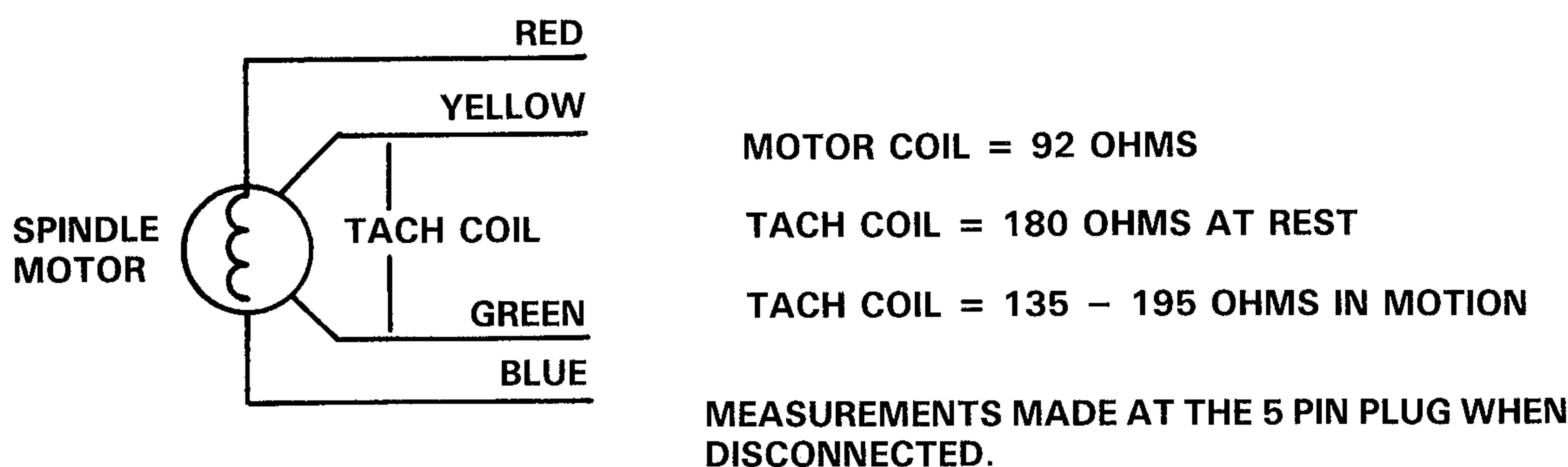
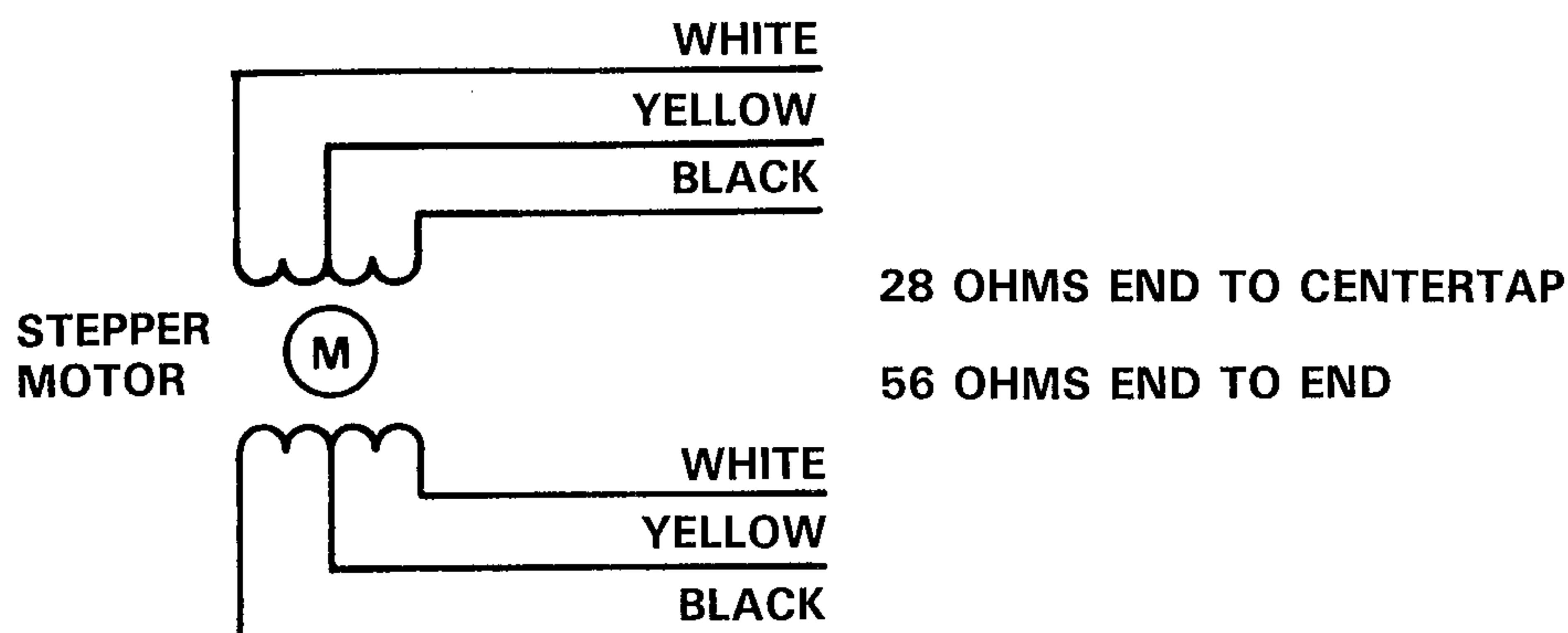


TRANSFORMER VOLTAGES +/- 1.5V.

PINS 4 & 6	16.5VAC
4 & 5	8.2VAC
5 & 6	8.2VAC
7 & 8	16 VAC

RESISTANCE CHECKS

MICROPOLIS AND MICROPOLIS SAFARI DRIVES



ALL MEASUREMENTS MADE AT THE APPROPRIATE CONNECTION WHEN DISCONNECTED FROM THE ANALOG PCB.

PARTS LIST

**805003101 Micropolis Drive 8050
825001601 Micropolis Drive 8250**

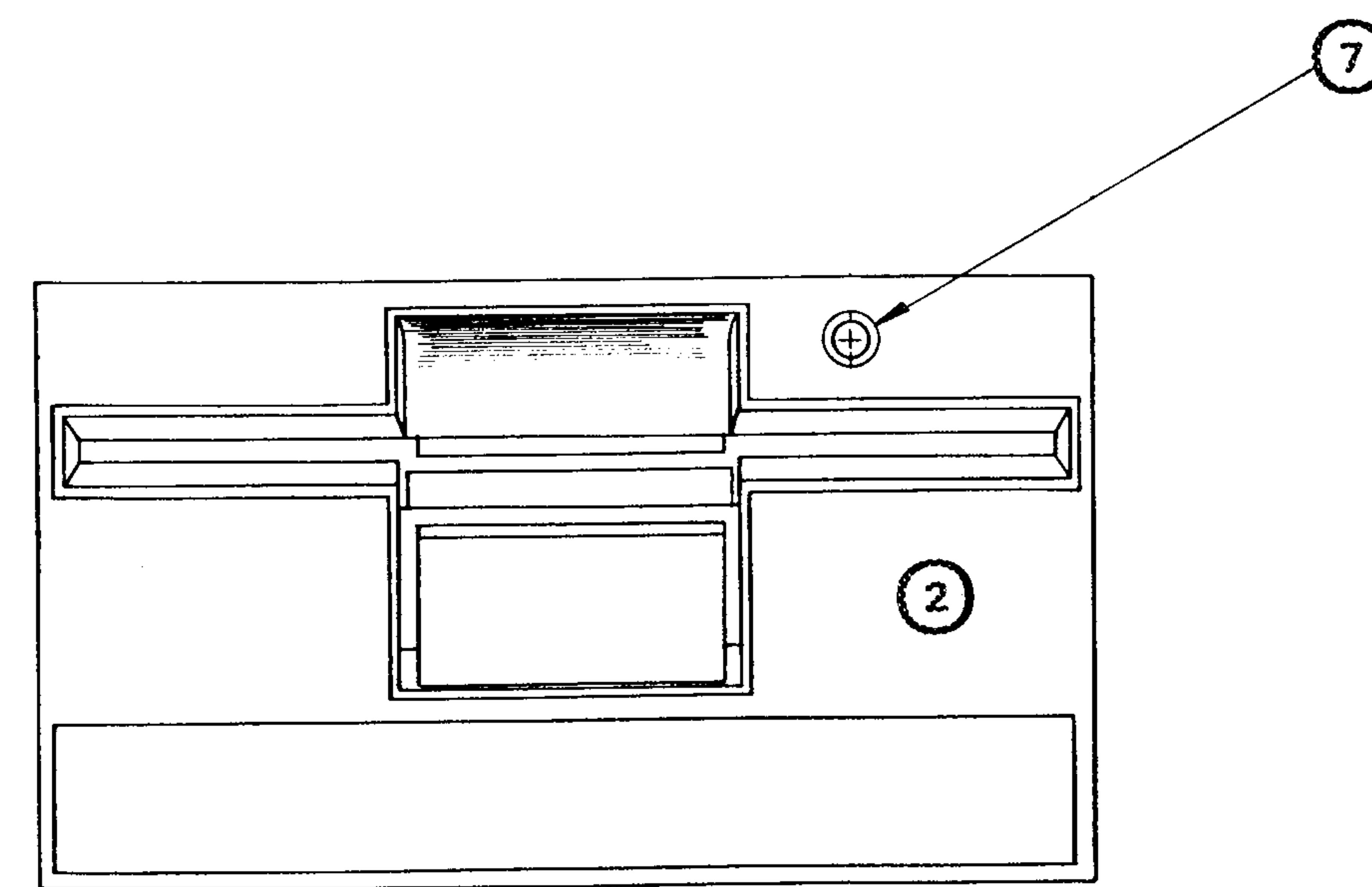
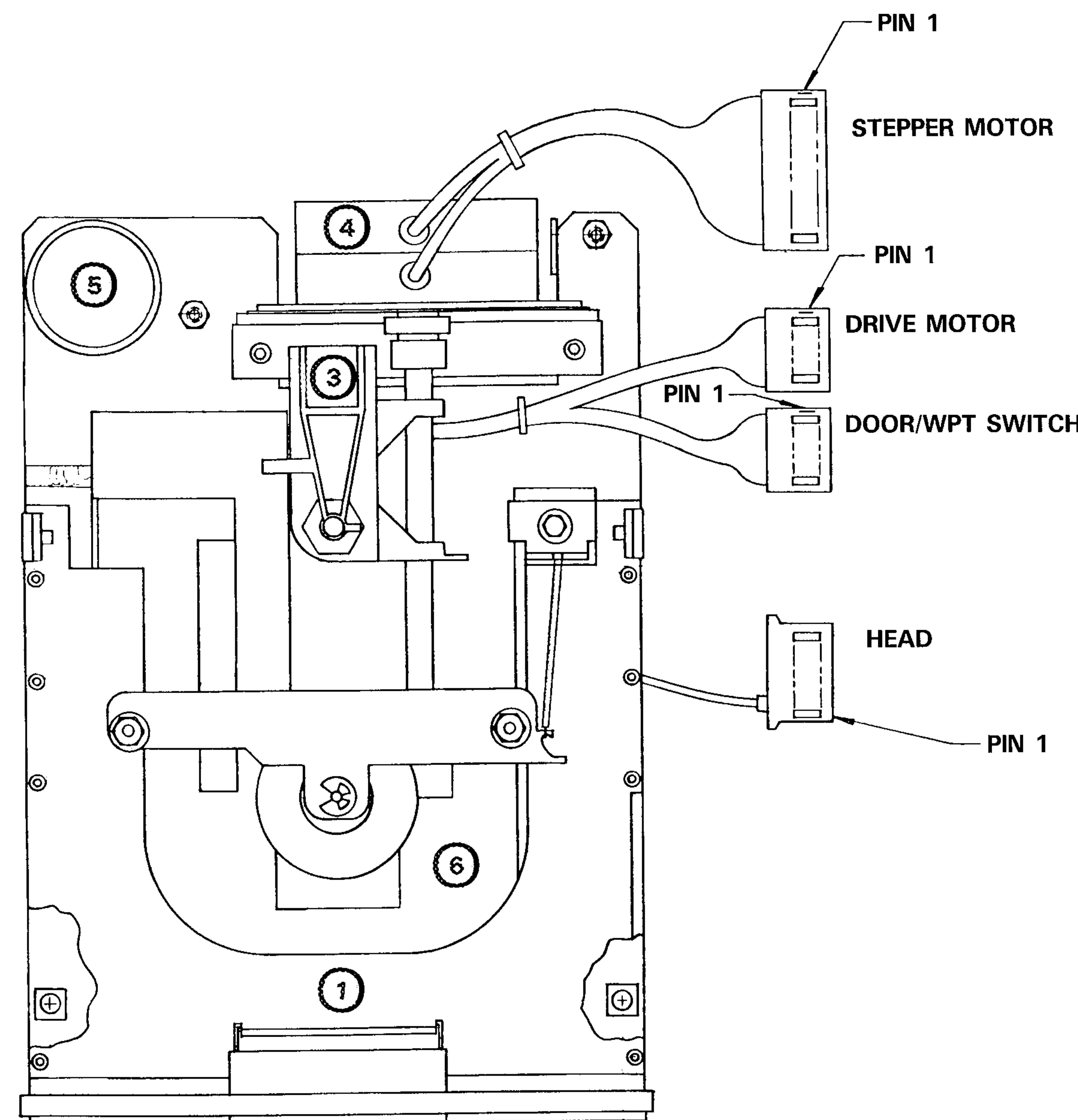
- ① 31416501 MIC DOOR/HUB ASSEMBLY
 - 1-Door Assy. w/Latch & Spring
 - 2-Disk Clamp Assy.
 - 3-Write Protect & Micro Switch Assy.
 - 4-Disk Eject Latch & Spring
- ② 31416601 MIC FRONT BEZEL
 - 31416701 MIC 8050 R/W HEAD Assy.
 - 1-R/W Head w/Harness
 - 2-Load Arm w/Pad
- ③ 31416801 MIC 8250 R/W HEAD Assy.
 - 1-Up/Low R/W Head w/Harness
- ④ 31416901 MIC STEPPER MOTOR Assy.
 - 1-Stepper Motor w/Harness
 - 2-Stepper Mounting Bracket
- ⑤ 31417001 MIC/MSA TACH MOTOR
- ⑥ 31417101 MIC HOUSING/SPINDLE Assy.
 - 1-Housing Base w/Standoffs
 - 2-Spindle/Tach Assy.
 - 3-Plastic Mountings

31417201 MIC DRIVE BELT

31417301 MIC HARDWARE
 - 1-Assorted Screws
 - 2-Assorted Springs
 - 3-1 Each: Platen, Pivot

31417401 Univ. Load Pad
- ⑦ 90382001 Univ. LED Holder (2 pc.)
 - 32086901 Drive 0 Label
 - 32086902 Drive 1 Label

MICROPOLIS DRIVE ASSEMBLIES
8050/8250



CONNECTOR	PIN NO.	WIRE COLOR	WIRE DESTINATION
STEPPER MOTOR	8	BLACK	POSITIONER MOTOR 04
	7	WHITE	02
	6	GREEN	CASE GROUND
	5	YELLOW	CENTER TAP 2
	4	YELLOW	CENTER TAP 1
	3	N/C	
	2	BLACK	03
	1	WHITE	POSITIONER MOTOR 01
DRIVE MOTOR	4	RED	+12V TO MOTOR
	3	YELLOW	TACHOMETER OUTPUT
	2	GREEN	TACHOMETER RETURN
	1	BLUE	SPINDLE DRIVE MOTOR
DOOR/WPT SWITCH	4	GREEN	DOOR SWITCH COMMON
	3	YELLOW	DOOR SWITCH NORMAL OPEN CONTACT
	2	BROWN/WHITE	WRITE PROTECT SWITCH COMMON CONTACT
	1	WHITE/RED	WRITE PROTECT SWITCH NORMAL CLOSED
HEAD SWITCH	5	BLACK	READ/WRITE GROUND
	4	YELLOW	ERASE GROUND
	3	RED	ERASE POSITIVE (W/RESPECT TO YEL)
	2	BLACK/CRIMP TERM	PLUG
	1	WHITE	READ/WRITE POSITIVE (W/RESPECT TO BLACK)

PARTS LIST

825003901 Microp. Safari Drive 8050

825003902 Microp. Safari Drive 8250

- ① 31424001 MSA DOOR ASSEMBLY
1-Door w/Door Plate & Spring
- ② 31424101 MSA HUB ASSEMBLY
1-Top Housing w/Hub
2-Write Protect & Micro Switch Assy.
- ③ 31424201 MSA FRONT BEZEL

31424301 MSA 8050 R/W HEAD ASSY.
1-R/W Head w/Harness
2-Load Arm w/Pad

31424401 MSA 8250 R/W HEAD ASSY.
1-Up/Low R/W Head w/Harness
- ④ 31424501 MSA STEPPER MOTOR ASSY.
1-Stepper Motor w/Harness
- ⑤ 31417001 MIC/MSA TACH MOTOR

31424601 MSA HOUSING/SPINDLE ASSY.
1-Housing Base
2-Spindle/Tach Assy.

31424701 MSA DRIVE BELT

31424801 MSA HARDWARE
1-Assorted Screws
2-Assorted Springs

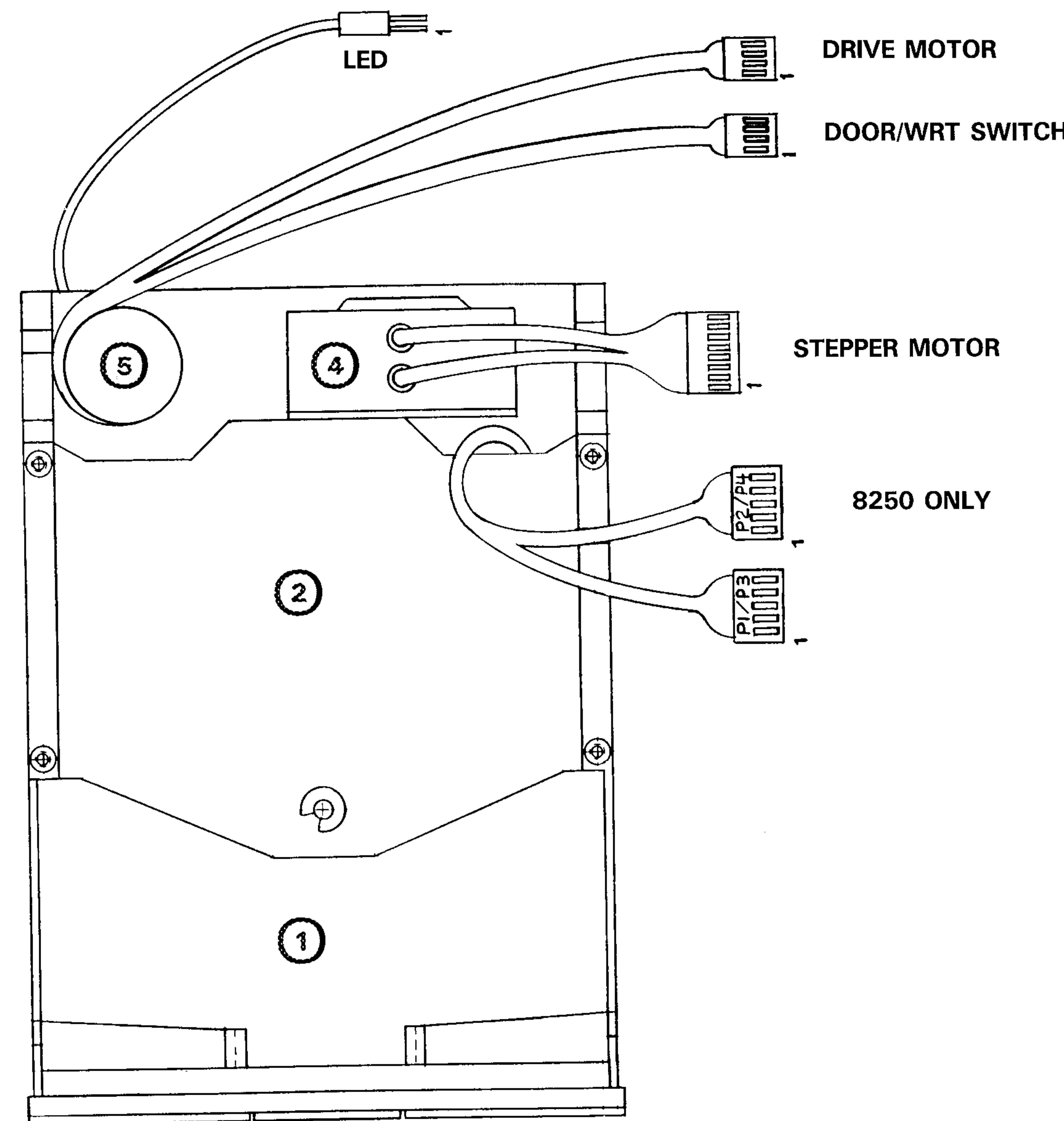
31417401 UNIV. Replacement Load Pad
- ⑥ 90382001 UNIV. LED Holder (2 pc.)

32086901 Drive 0 Label

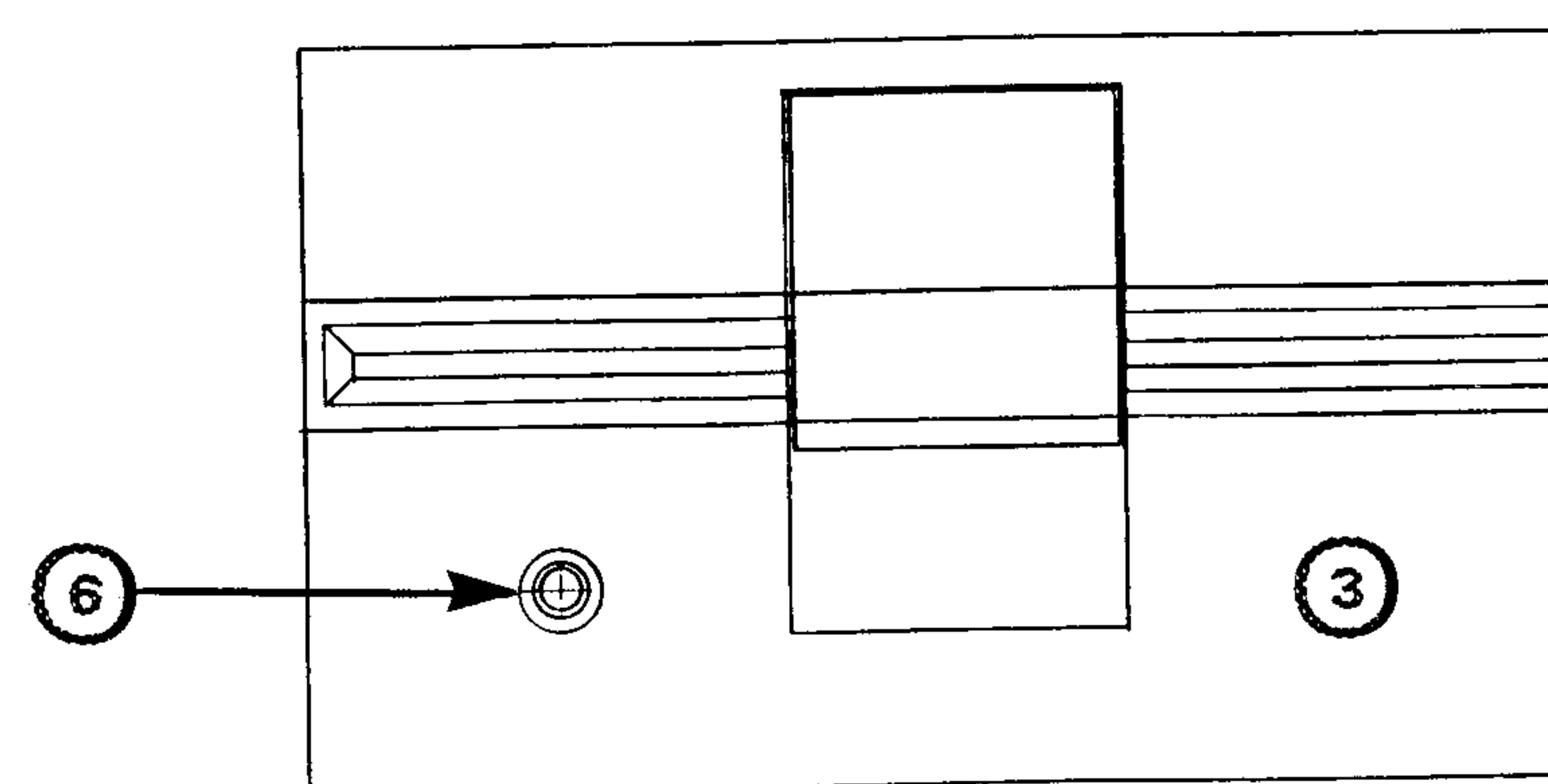
32086902 Drive 1 Label

MICROPOLIS SAFARI DRIVE ASSEMBLIES

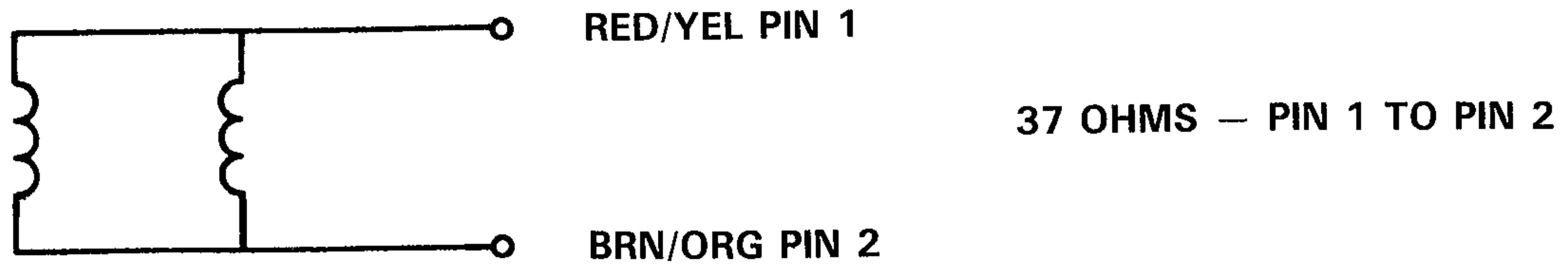
8050/8250



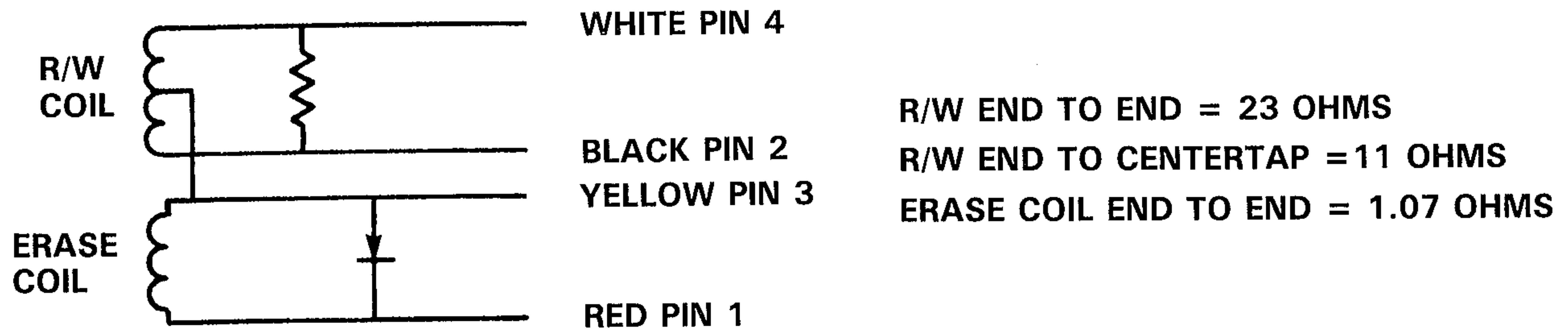
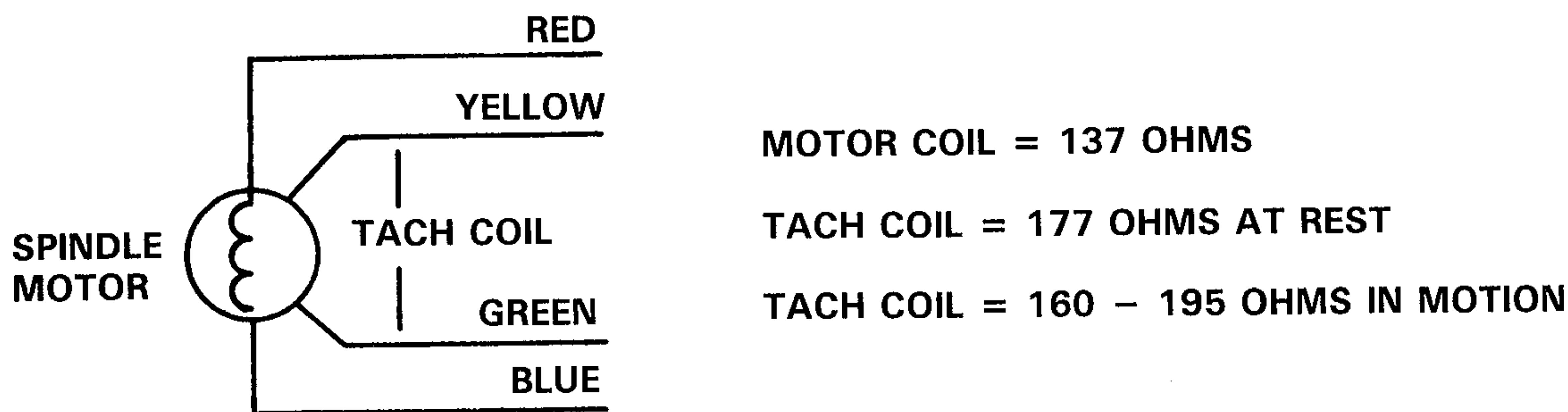
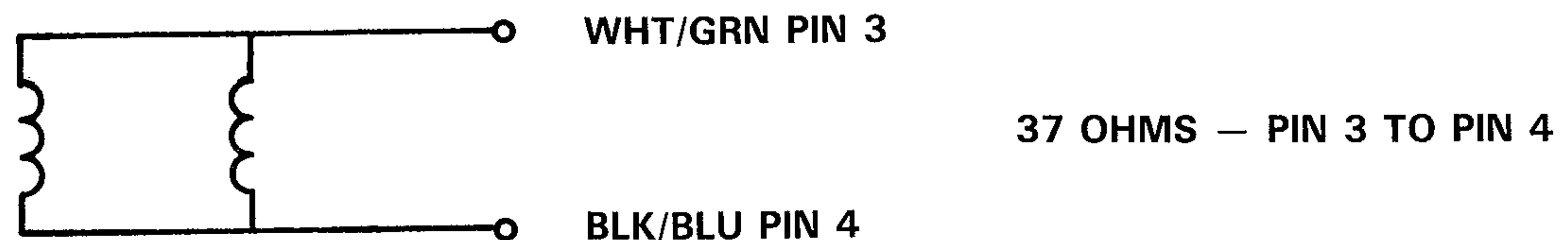
	PIN NO.	WIRE COLOR	WIRE DESTINATION
NO LABEL (LED)	2	BLACK	LED, CATHODE
	1	WHITE	LED, ANODE
	8	WHITE	STEPPER PHASE D
	7	BLACK	STEPPER PHASE B
	6	KEY	N/C
	5	YELLOW	STEPPER MOTOR +12
	4	YELLOW	STEPPER MOTOR +12
	3	KEY	N/C
	2	WHITE	STEPPER PHASE C
	1	BLACK	STEPPER PHASE A
NO LABEL (STEPPER MOTOR)	4	WHITE/RED	WRITE PROTECT SWITCH
	3	WHITE/BROWN	WRITE PROTECT SWITCH
	2	YELLOW	DOOR SWITCH
	1	GREEN	DOOR SWITCH
NO LABEL (DOOR/WPT Switch)	4	BLUE	DRIVE MOTOR RETURN
	3	GREEN	TACHOMETER
	2	YELLOW	TACHOMETER
	1	RED	DRIVE MOTOR +12
NO LABEL (DRIVE MOTOR)	5	BLACK	READ/WRITE HEAD
	4	BLACK	R/W AND ERASE COMMON
	3	BLACK	ERASE HEAD
	2	KEY	N/C
	1	BLACK	READ/WRITE HEAD
P2/P4 -02 ONLY	5	BLACK	READ/WRITE HEAD
	4	BLACK	R/W AND ERASE COMMON
	3	BLACK	ERASE HEAD
	2	KEY	N/C
	1	BLACK	READ/WRITE HEAD
P1/P3	5	BLACK	READ/WRITE HEAD
	4	BLACK	R/W AND ERASE COMMON
	3	BLACK	ERASE HEAD
	2	KEY	N/C
	1	BLACK	READ/WRITE HEAD
CONNECTOR			



RESISTANCE CHECKS TANDON DRIVES



**STEPPER
MOTOR**



ALL MEASUREMENTS MADE AT THE APPROPRIATE CONNECTION WHEN DISCONNECTED
FROM THE ANALOG PCB.


PARTS LIST

805004701 Tandon Drive 8050

825001501 Tandon Drive 8250

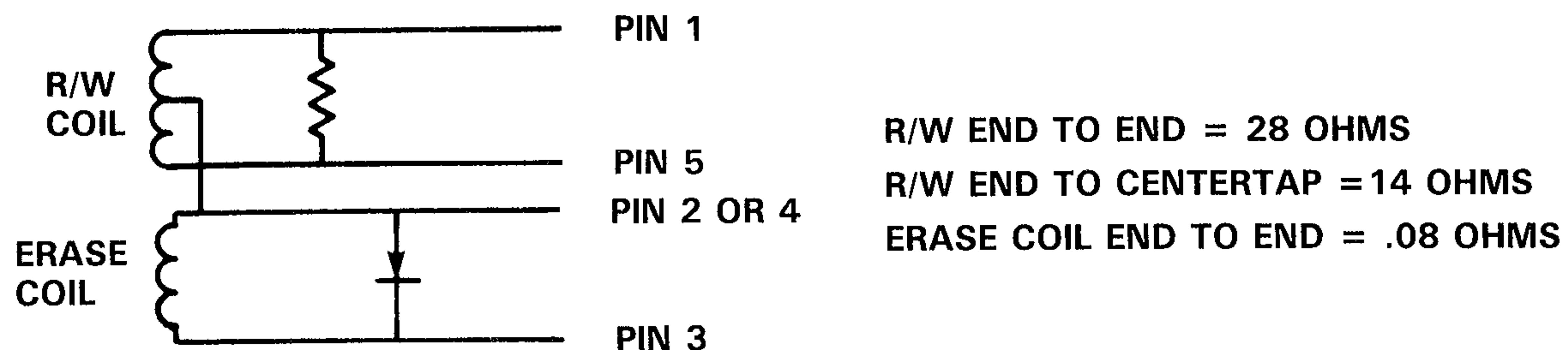
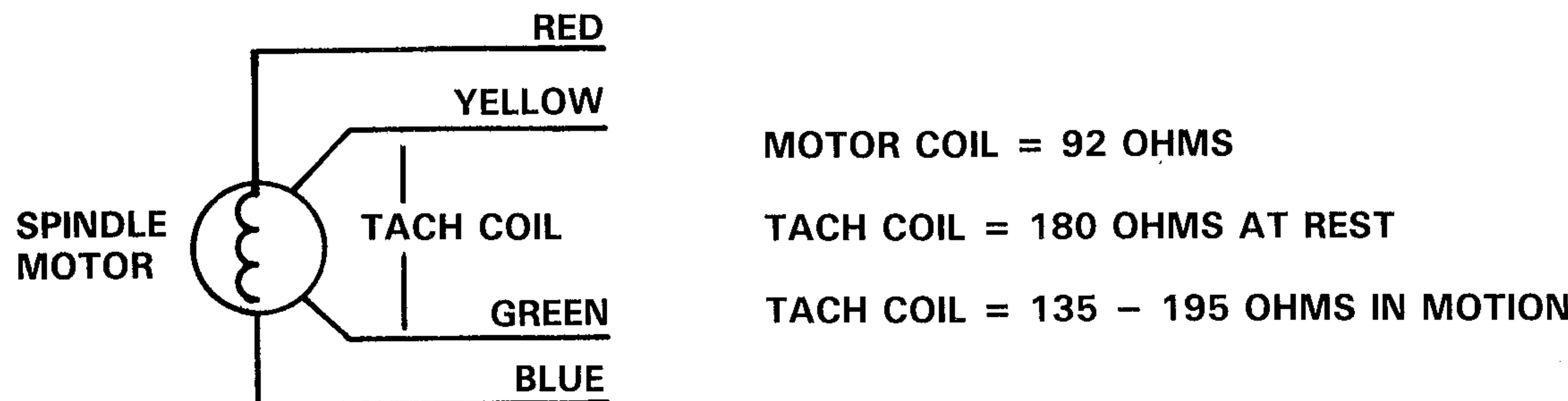
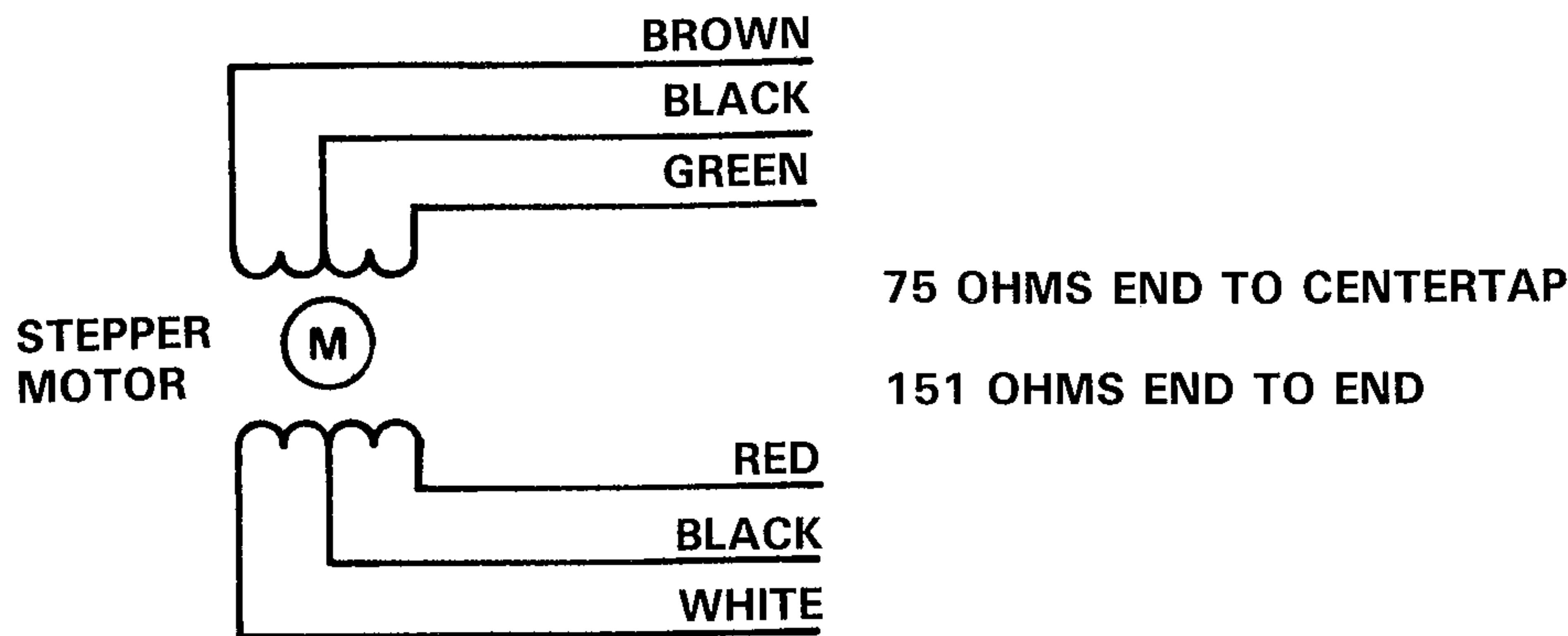
- ① 31419001 TAN DOOR/HUB ASSEMBLY
1-Door Assy. w/Frame
2-Hub/Collet Assy.
- ② 31419101 TAN LEFT DISK GUIDE
1-Left Disk Guide w/Actuator
- ③ 31419201 TAN RIGHT DISK GUIDE
- ④ 31419301 TAN FRONT BEZEL
- ⑤ 31419401 TAN 8050 R/W HEAD ASSY.
1-R/W Head w/Harness
2-Load Arm w/Pad
- 31419501 TAN 8250 R/W HEAD ASSY.
1-Up/Low R/W Head w/Harness
- ⑥ 31419601 TAN STEPPER MOTOR
1-Stepper Motor w/Harness
- ⑦ 31419701 TAN DC MOTOR
- ⑧ 31419801 TAN HOUSING/SPINDLE ASSY.
1-Housing Base
2-Spindle/Tach Assy.
3-L/R Guide Shafts
- 31419901 TAN DRIVE BELT
- 31420001 TAN HARDWARE
1-Assorted Screws
2-Assorted Springs, Etc.
- ⑨ 31420101 TAN WRITE PROTECT ASSY.
1-Write Protect Switch w/Harness
2-LED Indicator w/Harness
- ⑩ 31420201 TAN DOOR
31417401 UNIV. Replacement Load Pad
- ⑪ 90382001 UNIV. LED Holder (2 pc.)
32086901 Drive 0 Label
32086902 Drive 1 Label

**TANDON DRIVE ASSEMBLIES
8050/8250**



PIN	PIN NO.	WIRE COLOR	WIRE DESTINATION
P8	1	WHITE	WRITE PROTECT SWITCH NORMAL CLOSED
	2	WHITE	WRITE PROTECT SWITCH COMMON
	3	NC	-
	4	NC	-
P9	1	WHITE	ACTIVITY LED CATHODE
	2	WHITE	ACTIVITY LED ANODS
	3	NC	-
	4	NC	-
P12	1	RED	STEPPER MOTOR
	2	BROWN	STEPPER MOTOR
	3	GREEN	STEPPER MOTOR
	4	BLACK	STEPPER MOTOR
P21	1	YELLOW	TACHOMETER OUTPUT
	2	GREEN	TACHOMETER RETURN
	3	RED	MOTOR DRIVE
	4	BLUE	MOTOR RETURN
	5	NC	-
P6	1	RED	ERASE
	2	BLACK	READ/WRITE
	3	BLUE/YELLOW	CENTER TAP/ERASE (2 WIRES)
	4	WHITE	READ/WRITE
	5	BRAID	SHIELD
CONN. NO.	PIN NO.	WIRE COLOR	WIRE DESTINATION

RESISTANCE CHECKS MPI DRIVES



ALL MEASUREMENTS MADE AT THE APPROPRIATE CONNECTION WHEN DISCONNECTED FROM THE ANALOG PCB.

PARTS LIST

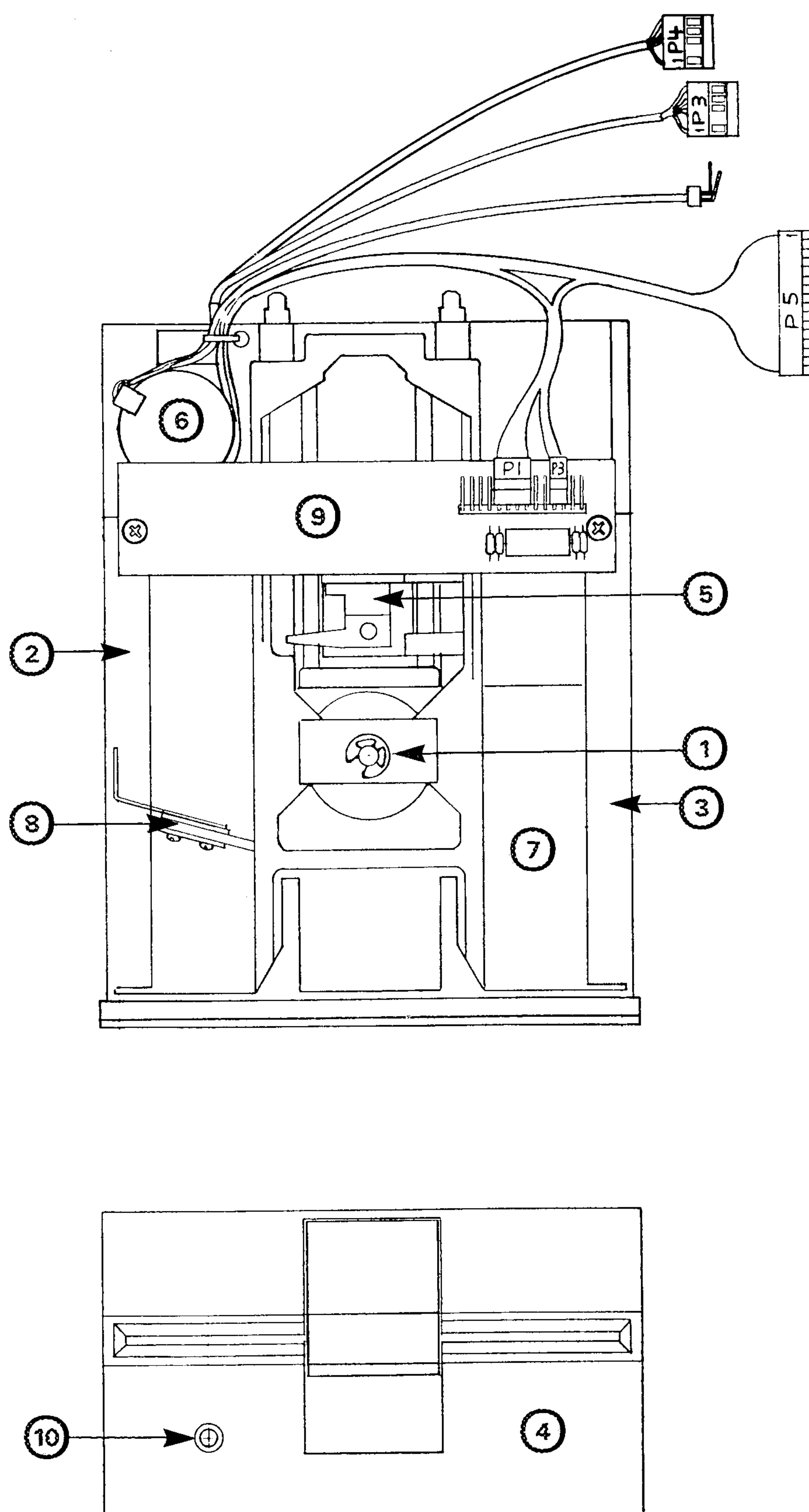
805005901 Drv0 MPI Drive 8050*
805005902 Drv1 MPI Drive 8050*

825002901 Drv0 MPI Drive 8250*
825002902 Drv1 MPI Drive 8250*

***NOTE:** Drv0 and Drv1 parts are interchangeable.
Separate part numbers are required for
complete drives due to the manner in
which the wiring harnesses are
assembled.

- (1) 31421501 MPI DOOR/HUB ASSEMBLY
1-Door Assy. w/Frame
2-Hub/Collect Assy.
- (2) 31421601 MPI LEFT DISK GUIDE
1-Left Disk Guide w/Write Protect Assy.
- (3) 31421701 MPI RIGHT DISK GUIDE
- (4) 31421801 MPI FRONT BEZEL
- (5) 31421901 MPI 8050 R/W HEAD ASSY.
1-R/W Head w/Harness
2-Load Arm w/Pad
- 31422001 MPI 8250 R/W HEAD ASSY.
1-Up/Low R/W Head w/Harness
- (6) 31422201 MPI DC MOTOR
- (7) 31422301 MPI HOUSING/SPINDLE ASSY.
1-Housing Base
2-Spindle/Tach Assy.
3-L/R Guide Shafts
- 31422401 MPI DRIVE BELT
- 31422501 MPI HARDWARE
1-Assorted Screws
2-Assorted Springs, Etc.
- (8) 31422601 MPI SWITCH/HARNESS ASSY.
1-Door Sensor Switch w/Mtg Bracket
2-Wiring Harness W/P & LED
- (9) 31422701 MPI W/P Servo PCB Drv1
31422801 MPI Analog PCB Bracket Drv0
31417401 UNIV. Replacement Load Pad
- (10) 90382001 UNIV. LED Holder (2 pc.)
32086901 Drive 0 Label
32086902 Drive 1 Label

MPI DRIVE ASSEMBLIES 8050/8250



DRIVE Ø WIRING

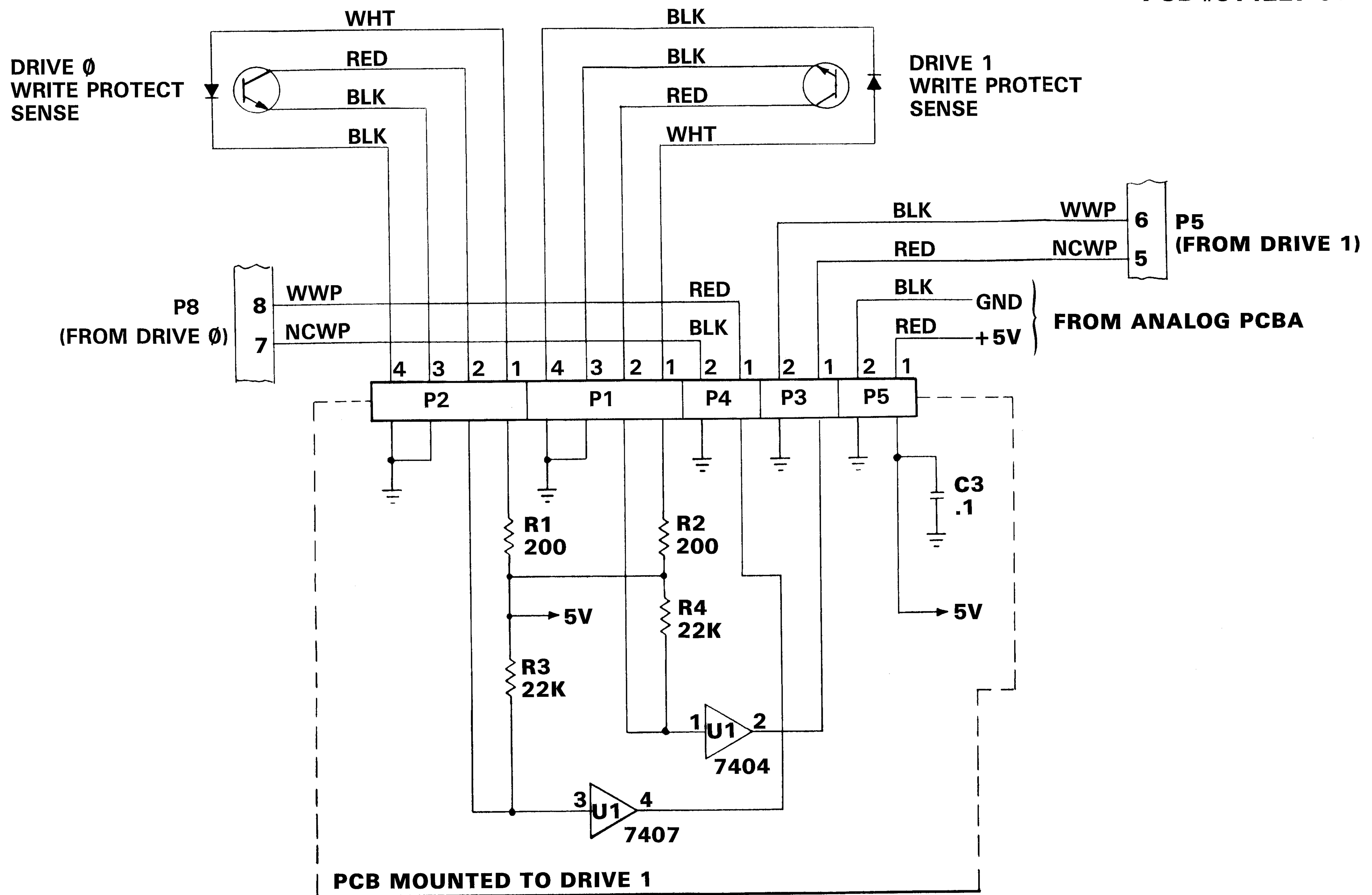
CONNECTOR	PIN NO.	WIRE COLOR	WIRE DESTINATION
P2	5	NOTE*	HEAD 1 (UPPER), R/W HEAD
	4	GRN/SHIELD,	SHIELD, CENTER TAP, COMMON
	3	RED,	ERASE HEAD
	2	N/C	—
P2	1	NOTE*	HEAD 1 (UPPER), R/W HEAD
P1	5	NOTE*	HEAD Ø (LOWER), R/W HEAD
	4	GRN/SHIELD,	SHIELD, CENTER TAP, COMMON
	3	RED,	ERASE HEAD
	2	N/C	—
P1	1	NOTE*	HEAD Ø (LOWER), R/W HEAD
P8	16	WHT	STEPPER MOTOR, PHASE D
	15	RED	STEPPER MOTOR, PHASE B
	14	N/C	—
	13	N/C	—
	12	BLK	STEPPER MOTOR, +12V
	11	N/C	—
	10	GRN	STEPPER MOTOR, PHASE C
	9	BRN	STEPPER MOTOR, PHASE A
	8	RED	(P4-1) WRITE PROTECT SWITCH, AMPLIFIER
	7	BLK	(P4-2) WRITE PROTECT SWITCH, GROUND
	6	BLK	DOOR SWITCH, NORMALLY OPEN
	5	RED	DOOR SWITCH, COMMON
	4	BLU	DRIVE MOTOR, RETURN
	3	YEL	TACHOMETER
	2	GRN	TACHOMETER
P8	1	RED	DRIVE MOTOR, +12
P4	2	BLK	(P6-7) WRITE PROTECT SWITCH, GROUND
P4	1	RED	(P8-8) WRITE PROTECT SWITCH, AMPLIFIER
P2	4	BLK	WR PROTECT LED, CATHODE
	3	BLK	WR PROTECT TRANSISTOR, Emitter
	2	RED	WR PROTECT TRANSISTOR, COLLECTOR
P2	1	RED	WR PROTECT LED, ANODE
NO LABEL	2	GRN	DRIVE LED, ANODE
NO LABEL	1	BLK	DRIVE LED, CATHODE
CONNECTOR			

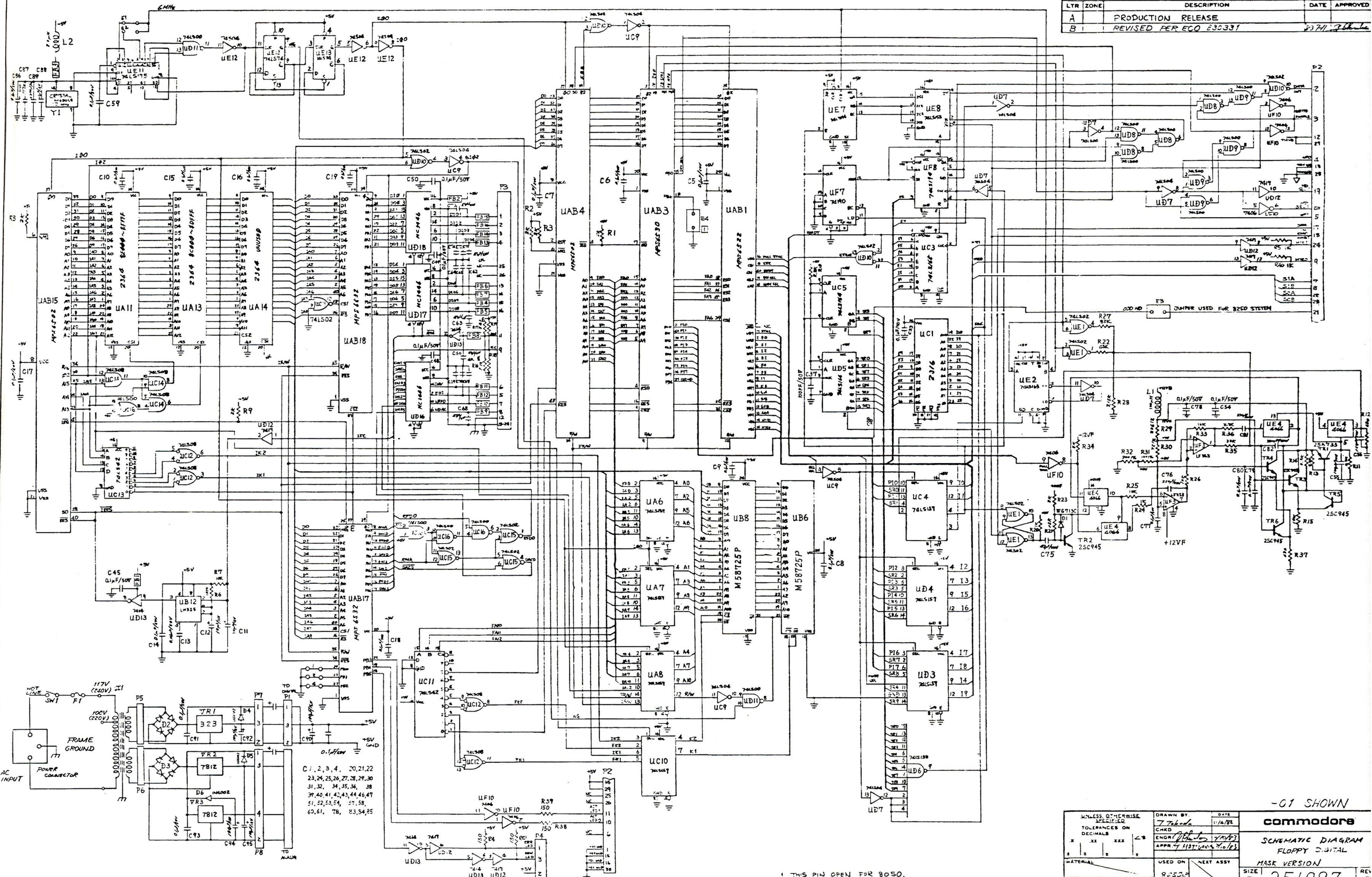
*NOTE: WIRE COLOR MAY BE BLACK OR WHITE.

DRIVE 1 WIRING

CONNECTOR	PIN NO.	WIRE COLOR	WIRE DESTINATION
P4	5	NOTE*	HEAD 1 (UPPER), R/W HEAD
	4	GRN/SHIELD,	SHIELD, CENTER TAP, COMMON
	3	RED,	ERASE HEAD
	2	N/C	—
P4	1	NOTE*	HEAD 1 (UPPER), R/W HEAD
P3	5	NOTE*	HEAD Ø (LOWER), R/W HEAD
	4	GRN/SHIELD,	SHIELD, CENTER TAP, COMMON
	3	RED,	ERASE HEAD
	2	N/C	—
P3	1	NOTE*	HEAD Ø (LOWER), R/W HEAD
P5	1	BLUE	DRIVE MOTOR RETURN
	2	YEL	TACHOMETER
	3	GRN	TACHOMETER
	4	RED	DRIVE MOTOR, +12V
	5	RED	(P3-1) WRITE PROTECT SWITCH, AMPLIFIER
	6	BLK	(P3-2) WRITE PROTECT SWITCH, COMMON
	7	BLK	DOOR SWITCH, NORMAL OPEN
	8	RED	DOOR SWITCH, COMMON
	9	WHT	STEPPER MOTOR, PHASE D
	10	RED	STEPPER MOTOR, PHASE B
	11	N/C	—
	12	N/C	—
	13	BLK	STEPPER MOTOR, +12V
	14	N/C	—
	15	GRN	STEPPER MOTOR, PHASE C
P5	16	BRN	STEPPER MOTOR, PHASE A
P3	2	BLK	(P5-6) WRITE PROTECT SWITCH, COMMON
P3	1	RED	(P5-5) WRITE PROTECT SWITCH, AMPLIFIER
P1	4	BLK	WR PROTECT, LED, CATHODE
	3	BLK	TRANSISTOR, Emitter
	2	RED	TRANSISTOR, COLLECTOR
P1	1	WHTZ	LED, ANODE
NO LABEL	2	GRN	DRIVE LED, ANODE
NO LABEL	1	BLK	DRIVE LED, CATHODE
CONNECTOR			

SCHEMATIC MPI SERVO
PCB #314227-01





1. THIS PIN OPEN FOR 8050.
THIS PIN CONNECTED TO +5V GND FOR 2250.

8050/8250 Parts

Location	Part Number	Description
UC4-UF5	2114 (8)	1K x 8 bit Static RAM

DOS:

UL1	901482-03	2364 ROM DOS 2.5 C000-DFFF
UH1	901482-04	2364 ROM DOS 2.5 E000-FFFF
UH1	901482-06	2364-091 ROM DOS 2.5 rev. E000-FFFF
UL1	901482-07	2364-092 ROM DOS 2.5 rev. C000-DFFF
UL1	901887-01	2364 ROM DOS 2.7 C000-DFFF
UH1	901888-01	2364 ROM DOS 2.7 E000-FFFF
UN1		6502 CPU
UC1, UE1		6532 (2) RIOT

Controller:

UH3		6502 CPU
UM3		6522 VIA
UK6	901467-01	6316-017 ROM GCR
UK3	901483-03	6530-038 RIOT DOS 2.5 Micropolis
UK3	901483-04	6530-039 RIOT DOS 2.5 Tandon
UK3	901869-01	6530-48 RIOT DOS 2.7 MPI
UK3	901884-01	6530-40 RIOT DOS 2.7 Tandon
UK3	901885-04	6530-47 RIOT DOS 2.7 Micropolis Micropolis 1006-II (8050) Micropolis 1006-IV (8250)
drive		Micropolis Safari (8050)
drive		Micropolis Safari (8250)
drive		MPI 101SM (8050)
drive		MPI (8250)
drive		Tandon (8050)
drive		Tandon (8250)

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