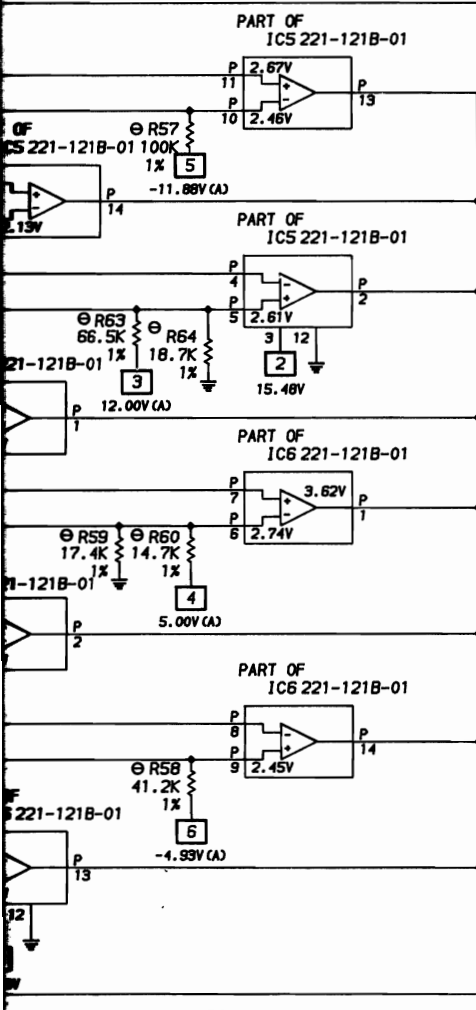
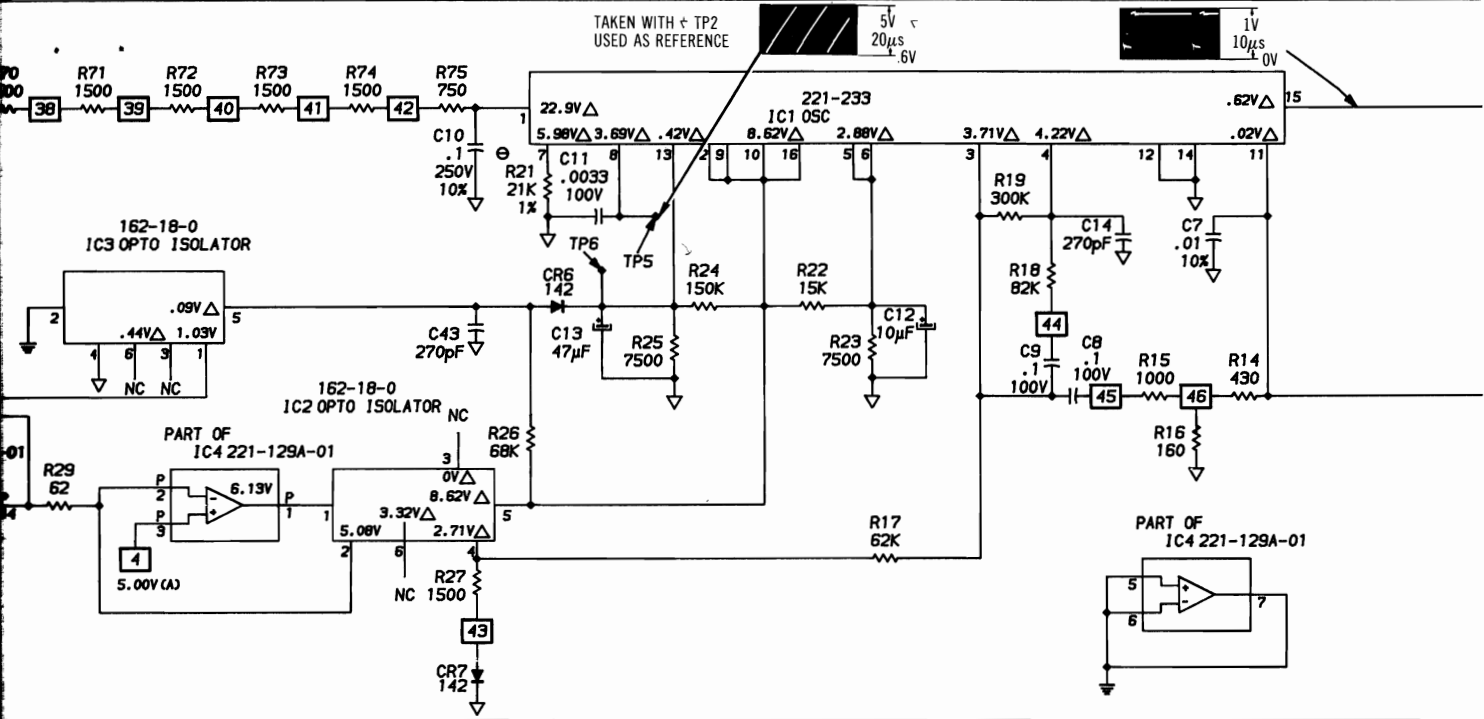


A PHOTOFAC STANDARD NOTATION SCHEMATIC  
 WITH **CIRCUITRACE™**  
 © Howard W. Sams & Co., Inc. 1984 **POWER SUPPLY**



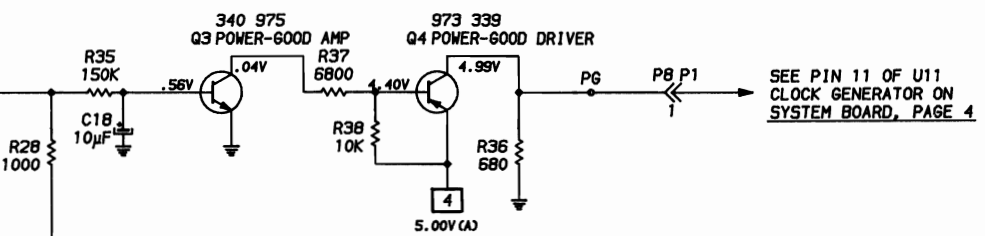
△ MEASURED FROM COMMON TIE POINT ▽

TAKEN WITH TP2 USED AS REFERENCE

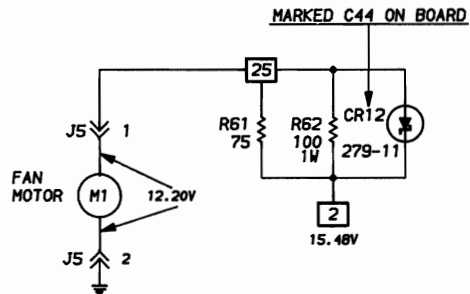


SEE PINOUTS, TERMINAL GUIDES AND SCHEMATIC NOTES PAGES 44, 50

SEE SCHEMATIC NOTES BEFORE TAKING VOLTAGES, WAVEFORMS AND LOGIC PROBE READINGS



SEE PIN 11 OF U11 CLOCK GENERATOR ON SYSTEM BOARD, PAGE 4



IBM  
MODEL 5150

POWER SUPPLY

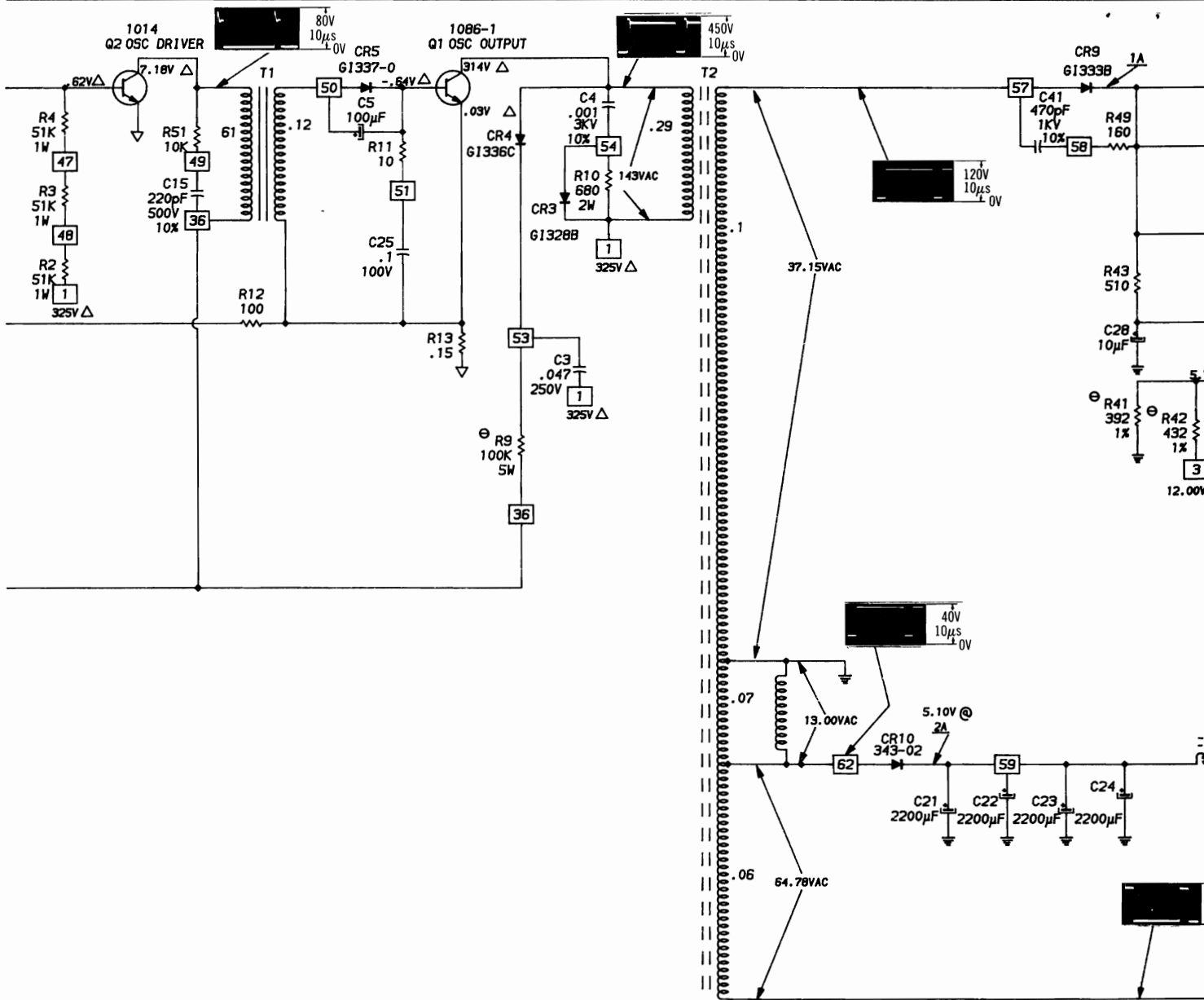


PHOTO CIRCUITRACE = 11

SCHEMATIC CIRCUITRACE = 11

SEE PINOUTS, TERMINAL GUIDES AND SCHEMATIC NOTES PAGES 44, 50

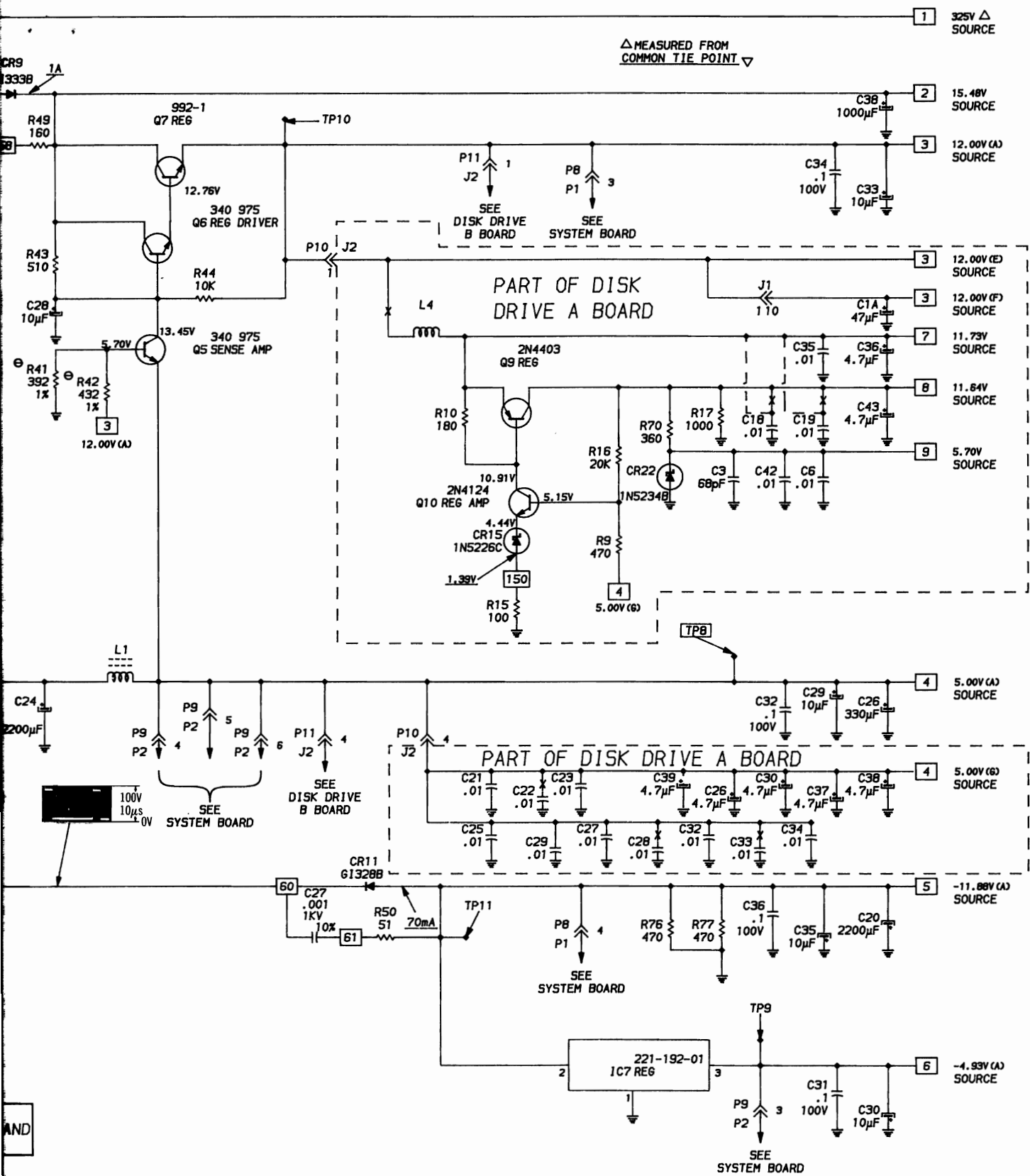
SEE SCHEMATIC NOTES BEFORE TAKING VOLTAGES, WAVEFORMS AND LOGIC PROBE READINGS

A PHOTOFAC STANDARD NOTATION SCHEMATIC

WITH CIRCUITRACE™

© Howard W. Sams & Co., Inc. 1984

POWER SUPPLY



C/SCS2  
MODEL 5150

IBM

POWER SUPPLY

## SAFETY PRECAUTIONS

1. Use an isolation transformer for servicing.
2. Maintain AC line voltage at rated input.
3. Remove AC power from the computer system before servicing or installing electrostatically sensitive devices. Examples of typical ES devices are integrated circuits and semiconductor "chip" components.
4. Use extreme caution when handling the printed circuit boards. Some semiconductor devices can be damaged easily by static electricity. Drain off any electrostatic charge on your body by touching a known earth ground. Wear a commercially available discharging wrist strap device. This should be removed prior to applying power to the unit under test.
5. Use a grounded-tip, low voltage soldering iron.
6. Use an isolation (times 10) probe on scope.
7. Do not remove or install boards, floppy disk drives, printers, or other peripherals with computer system AC power On.
8. Do not use freon-propelled sprays. These can generate electrical charges sufficient to damage semiconductor devices.
9. This computer system is equipped with a grounded three-pronged AC plug. This plug must fit into a grounded AC power outlet. Do not defeat the AC plug safety feature.
10. Periodically examine the AC power cord for damaged or cracked insulation.
11. The computer system cabinet is equipped with vents to prevent heat build-up. Never block, cover, or obstruct these vents.
12. Instructions should be given, especially to children, that objects should not be dropped or pushed into the vents of the cabinet. This could cause shock or equipment damage.
13. Never expose the computer system to water. If exposed to water turn the unit off. Do not place the computer system near possible water sources.
14. Never leave the computer system unattended or plugged into the AC outlet for long periods of time. Remove AC plug from AC outlet during lightning storms.
15. Do not allow anything to rest on AC power cord.
16. Unplug AC power cord from outlet before cleaning computer system.
17. Never use liquids or aerosols directly on the computer system. Spray on cloth and then apply to the computer system cabinet. Make sure the computer system is disconnected from the AC power line.

## SCHEMATIC NOTES

—\*— Circuitry not used in some versions

--- Circuitry used in some versions

⊙ See parts list

⊕ Ground

⏏ Chassis

▽ Common tie point

Waveforms and voltages taken from ground, unless noted otherwise.

Voltages, Waveforms and Logic probe readings taken with computer turned On, no keys pressed, unless otherwise noted.

Waveforms taken with triggered scope and Sweep/Time switch in Calibrate position, scope input set for DC coupling on 0 reference voltage waveforms. Switch to AC input to view waveforms after DC reference is measured when necessary. Each waveform is 7 cm. width with DC reference voltage given at the bottom line of each waveform.

Time in  $\mu$ sec. per cm, given with p-p reading at the end of each waveform.

Item numbers in rectangles appear in the alignment/adjustment instructions.

Supply voltages maintained as shown at input.

Voltages measured with digital meter, no signal.

Controls adjusted for normal operation.

Terminal identification may not be found on unit.

Capacitors are 50 volts or less, 5% unless noted.

Electrolytic capacitors are 50 volts or less, 20% unless noted.

Resistors are  $\frac{1}{2}$ W or less, 5% unless noted.

Value in ( ) used in some versions.

Measurements with switching as shown, unless noted.

Logic Probe Display

L = Low

H = High

P = Pulse

\* = Open (No light On)

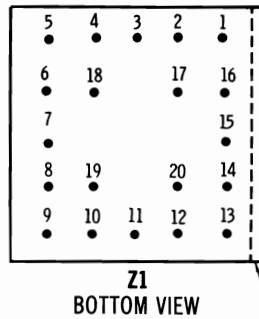
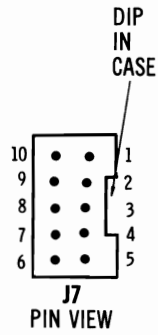
(1) Probe indicates P when a key is pressed.

(2) Probe indicates H when speakers sounds.

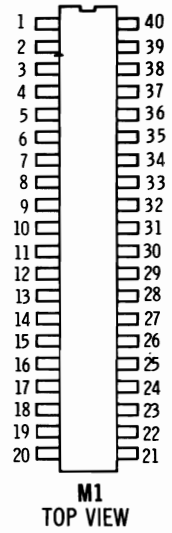
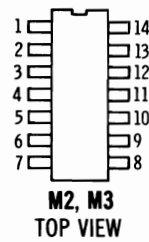
(3) Probe indicates P while beeping speaker.

(4) Probe indicates L when cassette motor turns On.

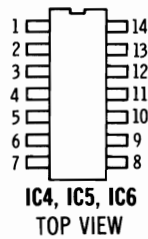
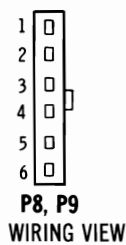
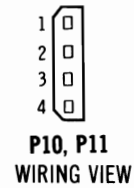
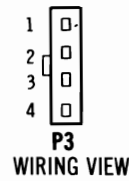
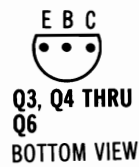
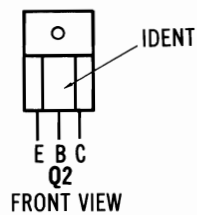
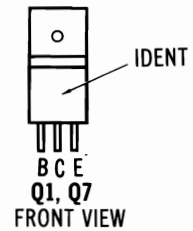
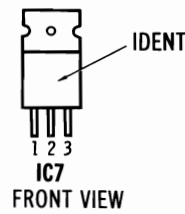
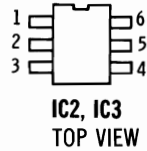
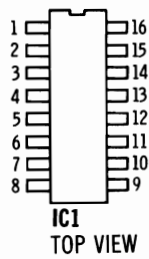
(5) Probe indicates H when cassette motor turns Off.



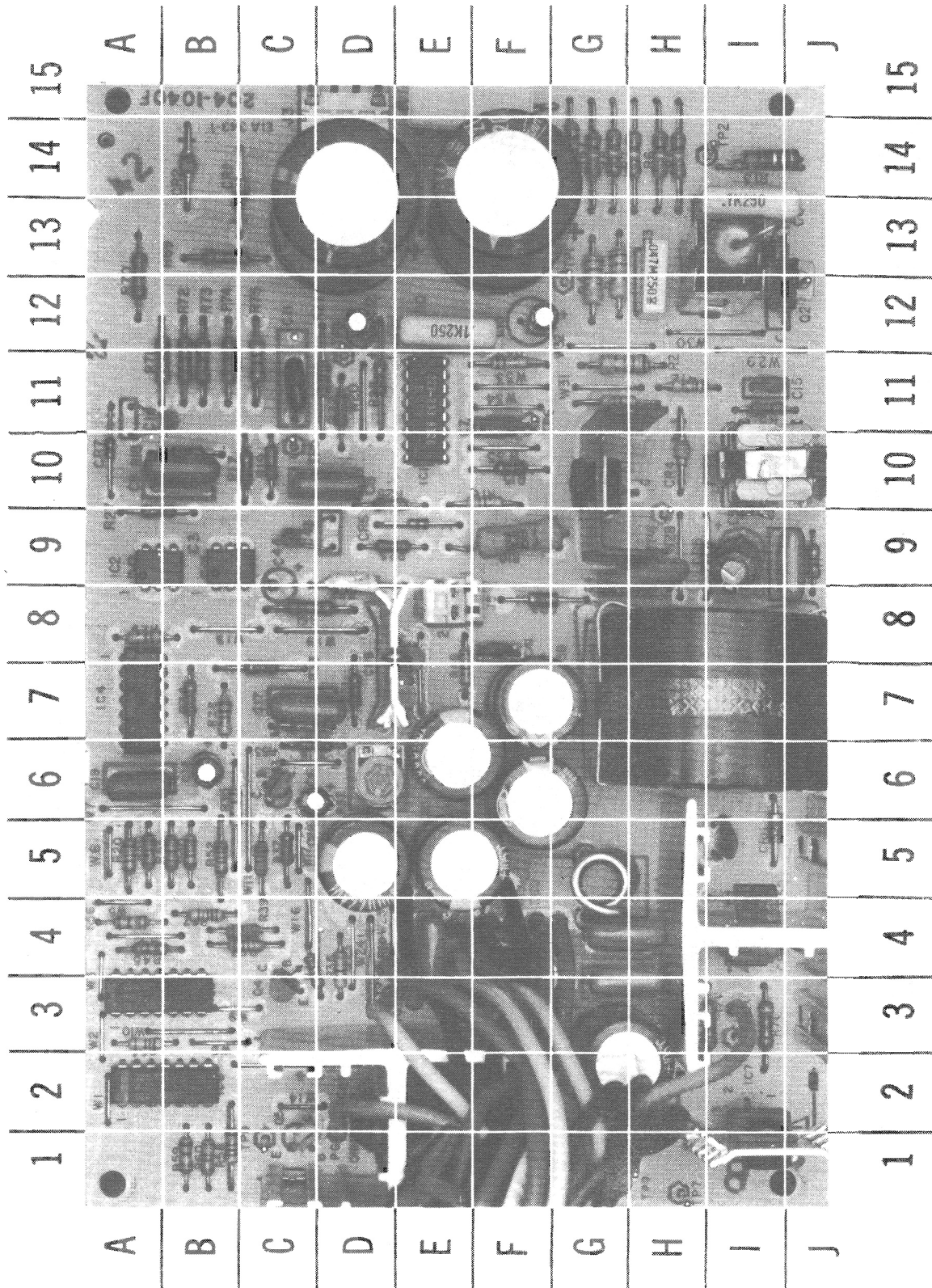
BEVELED ON TOP



KEYBOARD TYPE 2



POWER SUPPLY



**POWER BOARD** A Howard W. Sams **GRIDTRACE™** Photo

## SYSTEM BOARD GridTrace LOCATION GUIDE

|     |      |      |      |     |      |     |      |     |      |
|-----|------|------|------|-----|------|-----|------|-----|------|
| C3  | C-4  | C7H  | S-23 | R11 | A-16 | U12 | P-12 | U50 | C-19 |
| C3A | I-25 | C7J  | S-21 | R12 | A-16 | U13 | P-12 | U51 | B-19 |
| C3B | K-25 | C7K  | S-18 | R13 | C-9  | U14 | O-12 | U52 | A-19 |
| C3C | M-25 | C7L  | M-14 | R14 | C-10 | U15 | N-12 | U53 | R-21 |
| C3D | Q-25 | C7M  | I-10 | R15 | A-9  | U16 | L-12 | U54 | P-12 |
| C3E | Q-25 | C8   | M-4  | R16 | B-7  | U17 | K-12 | U55 | O-21 |
| C3F | R-25 | C9   | E-27 | R17 | C-3  | U18 | J-12 | U56 | N-21 |
| C3G | S-27 | C10  | D-2  | R18 | C-7  | U19 | I-12 | U57 | M-21 |
| C3H | R-22 | C10A | E-2  | R19 | C-5  | U23 | E-11 | U58 | L-21 |
| C3J | R-20 | C10C | C-3  | R20 | N-10 | U24 | C-12 | U59 | K-21 |
| C3K | I-22 | D1   | N-1  | R21 | C-10 | U26 | A-12 | U60 | J-21 |
| C3L | P-22 | J1   | S-3  | R22 | A-7  | U27 | N-14 | U61 | J-21 |
| C3M | N-22 | J2   | Q-3  | R23 | H-27 | U29 | O-16 | U62 | H-21 |
| C3N | L-22 | J3   | O-3  | R25 | B-8  | U30 | N-16 | U63 | G-21 |
| C3P | J-22 | J4   | L-4  | RN1 | H-12 | U31 | L-16 | U64 | F-21 |
| C3Q | I-20 | J5   | J-3  | RN2 | F-12 | U32 | J-16 | U65 | D-21 |
| C3R | K-20 | J6   | F-1  | RN3 | A-21 | U33 | I-16 | U66 | C-21 |
| C3S | M-20 | J7   | D-1  | RN4 | H-23 | U34 | F-16 | U67 | B-21 |
| C3T | O-20 | K1   | I-1  | SW1 | G-12 | U35 | D-15 | U79 | G-23 |
| C3U | J-14 | P1   | A-3  | SW2 | B-11 | U36 | B-15 | U80 | F-23 |
| C3V | H-13 | P2   | A-6  | T1  | A-8  | U37 | R-19 | U81 | D-23 |
| C3W | O-27 | P3A  | Q-27 | TD1 | E-26 | U38 | P-19 | U82 | C-23 |
| C3X | L-27 | P4   | I-27 | TD2 | A-17 | U39 | O-19 | U83 | B-23 |
| C3Y | J-27 | R1   | N-1  | U1  | P-2  | U40 | N-19 | U84 | A-23 |
| C5  | M-27 | R2   | N-2  | U2  | H-5  | U41 | M-19 | U94 | H-26 |
| C7  | B-1  | R3   | N-2  | U3  | F-5  | U42 | L-19 | U95 | G-25 |
| C7A | B-3  | R4   | M-2  | U5  | C-4  | U43 | K-19 | U96 | D-26 |
| C7B | B-4  | R5   | M-2  | U6  | B-6  | U44 | J-19 | U97 | C-26 |
| C7C | B-5  | R6   | F-27 | U7  | H-9  | U45 | I-19 | U98 | B-26 |
| C7D | A-16 | R7   | G-27 | U8  | G-9  | U46 | H-19 | U99 | A-26 |
| C7E | B-27 | R8   | G-27 | U9  | E-9  | U47 | G-19 | X1  | A-10 |
| C7F | I-27 | R9   | F-27 | U10 | D-9  | U48 | F-19 |     |      |
| C7G | S-25 | R10  | G-27 | U11 | B-9  | U49 | E-19 |     |      |

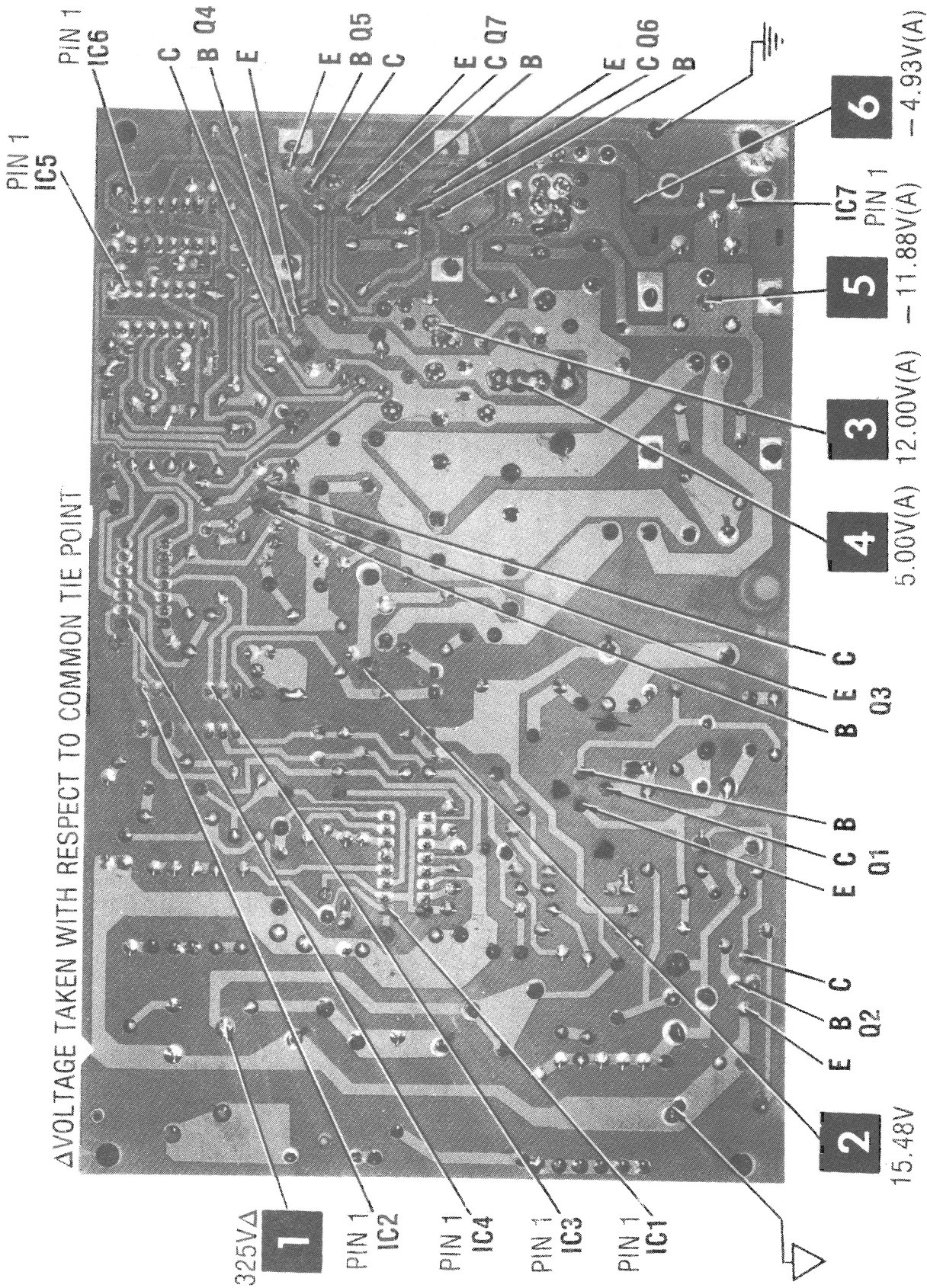
**CSCS2**

IBM  
MODEL 5150

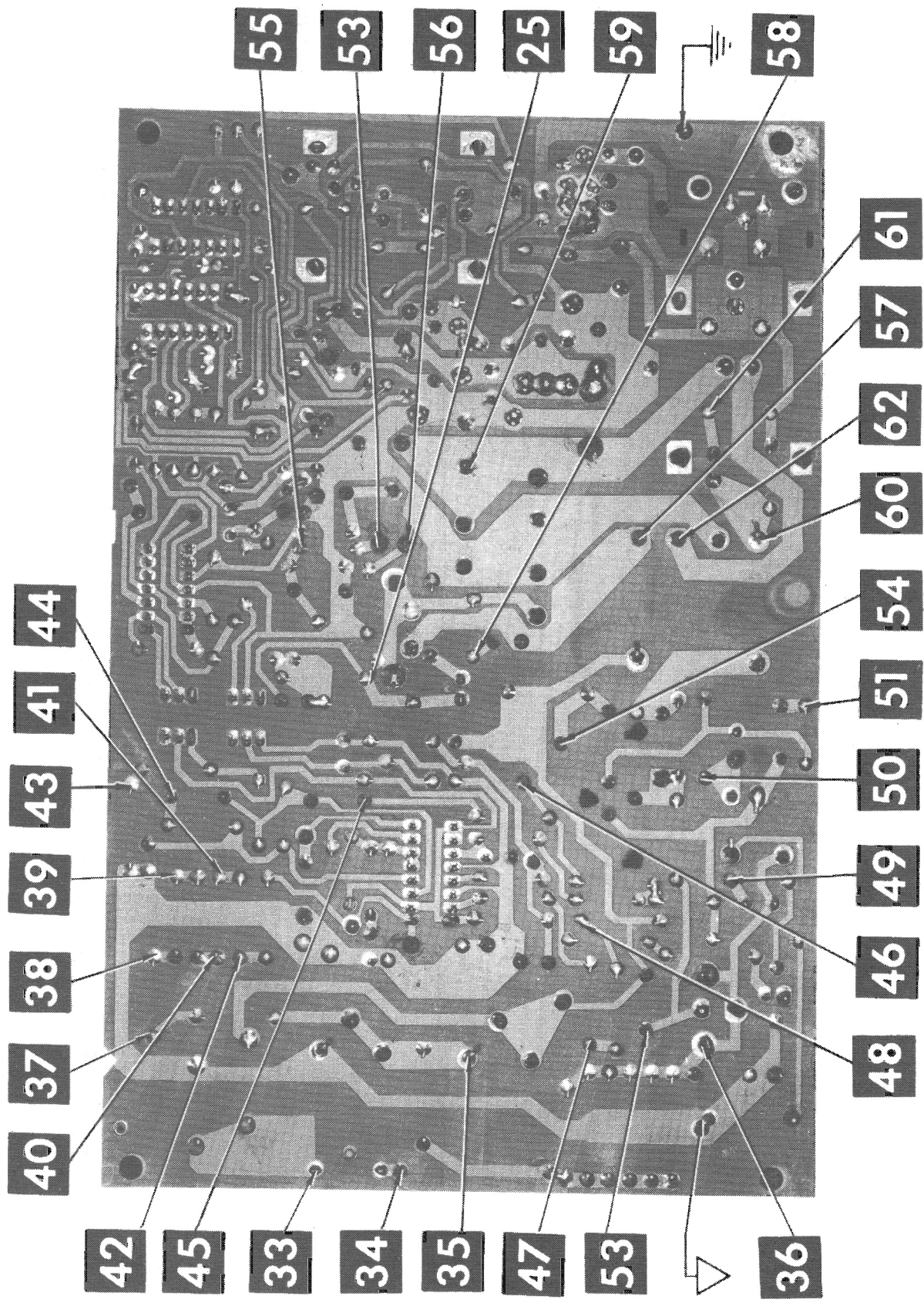
## POWER BOARD GridTrace LOCATION GUIDE

|     |      |      |      |      |      |     |      |      |      |
|-----|------|------|------|------|------|-----|------|------|------|
| C1  | F-14 | C31  | H-1  | P/J5 | E-8  | R23 | D-11 | R56  | A-4  |
| C2  | D-13 | C32  | G-4  | Q1   | G-10 | R24 | F-11 | R57  | B-4  |
| C3  | H-13 | C33  | F-3  | Q2   | J-12 | R25 | D-9  | R58  | B-1  |
| C4  | H-9  | C34  | E-4  | Q3   | C-5  | R26 | D-10 | R59  | B-1  |
| C5  | I-9  | C35  | G-2  | Q4   | C-3  | R27 | A-9  | R60  | B-1  |
| C6  | I-13 | C36  | G-3  | Q5   | C-1  | R28 | B-7  | R61  | C-8  |
| C7  | F-11 | C38  | F-7  | Q6   | E-2  | R29 | A-8  | R62  | D-8  |
| C8  | D-10 | C41  | F-8  | Q7   | D-2  | R30 | A-5  | R63  | C-4  |
| C9  | A-10 | C43  | C-9  | R1   | E-15 | R31 | D-7  | R64  | C-4  |
| C10 | E-12 | C44  | C-9  | R2   | G-11 | R32 | D-6  | R66  | G-14 |
| C11 | C-11 | CR1  | B-14 | R3   | G-12 | R33 | C-7  | R67  | G-14 |
| C12 | D-12 | CR2  | B-14 | R4   | G-12 | R34 | B-7  | R69  | B-13 |
| C13 | F-12 | CR3  | F-8  | R5   | H-14 | R35 | B-6  | R70  | A-12 |
| C14 | A-11 | CR4  | H-10 | R6   | H-14 | R36 | D-4  | R71  | A-11 |
| C15 | I-11 | CR5  | H-9  | R7   | H-14 | R37 | C-5  | R72  | B-11 |
| C16 | C-6  | CR6  | E-9  | R8   | G-14 | R38 | C-4  | R73  | B-11 |
| C17 | C-7  | CR7  | A-10 | R9   | I-13 | R39 | C-5  | R74  | B-11 |
| C18 | B-6  | CR8  | C-7  | R10  | F-9  | R40 | B-5  | R75  | C-11 |
| C19 | A-6  | CR9  | E-8  | R11  | J-9  | R41 | F-2  | R76  | I-3  |
| C20 | G-2  | CR10 | I-4  | R12  | H-11 | R42 | F-3  | R77  | H-3  |
| C21 | E-5  | CR11 | I-5  | R13  | I-14 | R43 | E-2  | T1   | I-10 |
| C22 | D-5  | IC1  | E-11 | R14  | G-11 | R44 | E-1  | T2   | I-7  |
| C23 | E-6  | IC2  | A-9  | R15  | F-10 | R45 | A-4  | TP5  | C-10 |
| C24 | F-6  | IC3  | B-9  | R16  | F-10 | R49 | E-7  | TP6  | F-11 |
| C25 | J-9  | IC4  | A-7  | R17  | C-10 | R50 | I-4  | TP8  | C-1  |
| C26 | F-4  | IC5  | A-3  | R18  | A-10 | R51 | I-11 | TP9  | H-1  |
| C27 | I-5  | IC6  | A-2  | R19  | C-10 | R52 | B-5  | TP10 | D-3  |
| C28 | F-1  | IC7  | I-2  | R20  | A-5  | R53 | B-5  | TP11 | I-3  |
| C29 | F-4  | L1   | G-5  | R21  | D-11 | R54 | A-3  |      |      |
| C30 | G-1  | P/J3 | D-15 | R22  | D-11 | R55 | C-6  |      |      |

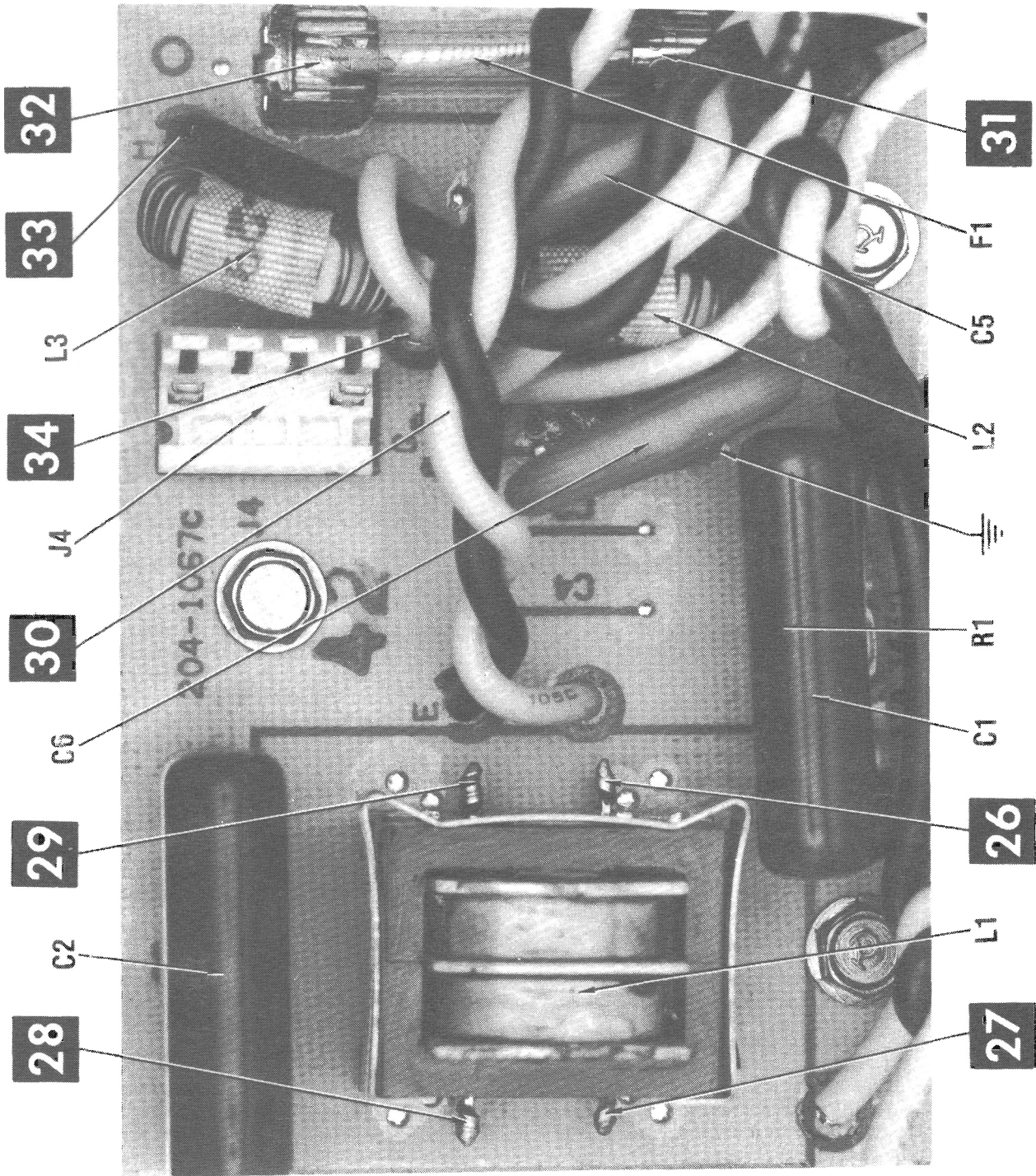




IBM  
MODEL 5150



POWER BOARD A Howard W. Sams CIRCUITRACE® Photo



A Howard W. Sams CIRCUITRACE® Photo AC INPUT BOARD

# PARTS LIST AND DESCRIPTION

When ordering parts, state Model, Part Number, and Description

## SEMICONDUCTORS

| ITEM No.               | TYPE No.        | MFGR. PART No.      |
|------------------------|-----------------|---------------------|
| <b>KEYBOARD TYPE 2</b> |                 |                     |
| M1                     | 8340X7<br>8048  |                     |
| M2                     | 239 2122SH      |                     |
| M3                     | 158 2606BP      |                     |
| Z1                     | IMB 9314 ESD    |                     |
| <b>POWER SUPPLY</b>    |                 |                     |
| CR1                    | G1336           | 315-6G1336<br>(1)   |
| CR2                    | G1340           | 315-6G1340<br>(1)   |
| CR3                    | G1328B          | 344-07G1328B<br>(1) |
| CR4                    | G1336C          | 287G1336C<br>(1)    |
| CR5                    | G13370          | 347-03G13370<br>(1) |
| CR6,7                  | 142             |                     |
| CR8                    | 279-13335       |                     |
| CR9                    | G1333B          | 345-02G1333B<br>(1) |
| CR10                   | 343-02          | 735 339(1)          |
| CR11                   | G1328B          | 344-02G1328B<br>(1) |
| CR12                   | 279-11<br>(C44) |                     |
| IC1                    | 221-233         |                     |
| IC2,3                  | 162-18-0        |                     |
| IC4                    | 221-129A-01     |                     |
| IC5,6                  | 221-121B-01     |                     |
| IC7                    | 221-192-01      |                     |
| Q1                     | 1086-1          | 584342(1)           |
| Q2                     | 1014            |                     |
| Q3                     | 340 975         |                     |
| Q4                     | 973 339         |                     |
| Q5,6                   | 340 975         |                     |
| Q7                     | 992-1           | 548342(1)           |
| <b>PRINTER ADAPTER</b> |                 |                     |
| U1                     | 74LS245PC       |                     |
| U2                     | 74LS240PC       |                     |
| U3                     | SN74LS244N      |                     |
| U4                     | SN74LS374N      |                     |
| U5                     | SN74LS30N       |                     |
| U6                     | DM74LS155N      |                     |
| U7                     | 74LS174PC       |                     |
| U8                     | 7405PC          |                     |
| U9                     | SN74LS02N       |                     |
| U10                    | 74LS125APC      |                     |
| U11                    | 74LS86PC        |                     |
| <b>SYSTEM BOARD</b>    |                 |                     |
| D1                     | 1N659<br>FC     |                     |

| ITEM No.           | TYPE No.                   | MFGR. PART No.                   |
|--------------------|----------------------------|----------------------------------|
| U1                 | MC1741CP<br>MC1741         |                                  |
| U2                 | P8259A<br>8259A            |                                  |
| U3                 | P8088                      | (3)                              |
| U4                 | 8087                       | (3)                              |
| U5                 | SN74LS30N                  |                                  |
| U6                 | D8288                      |                                  |
| U7                 | 74LS373PC                  |                                  |
| U8                 | SN74LS245N                 |                                  |
| U9,10              | 74LS373PC                  |                                  |
| U11                | UPB8284AD<br>8284A         |                                  |
| U12<br>thru<br>U14 | SN74LS245N                 |                                  |
| U15<br>thru<br>U17 | SN74LS244N                 |                                  |
| U18                | 74LS373PC                  |                                  |
| U19                | 74LS670PC                  |                                  |
| U23                | SN74LS244N                 |                                  |
| U24                | SN74LS322AN                |                                  |
| U26                | 74LS175PC                  |                                  |
| U27                | 74LS02PC                   |                                  |
| U29                | 5000017<br>5700019         | MK36A68N-4<br>MK36748N<br>(1)(2) |
| U30                | XE5000021<br>5700027       | (1)<br>(2)                       |
| U31                | XE5000022<br>5700035       | MK36905N-4<br>(1)(2)             |
| U32                | 5000023                    | MK36A71N-4<br>(1)                |
|                    | 5700043                    | (2)                              |
| U33                | 1501476                    | MK36C35N-4<br>(1)                |
|                    | 5700671                    | MK36887N-4<br>(1)(2)             |
| U34                | D8253C-5<br>8253-5         |                                  |
| U35                | D8237A-5<br>D8237AS        |                                  |
| U36                | P8255A-5<br>8255A-5        |                                  |
| U37                | MK4564N-20<br>MK4116J-44GP | (2)                              |
| U38<br>thru<br>U40 | MK4564N-15<br>MK4116J-44GP | (2)                              |
| U41                | MK4564N-20<br>MK4116J-44GP | (2)                              |