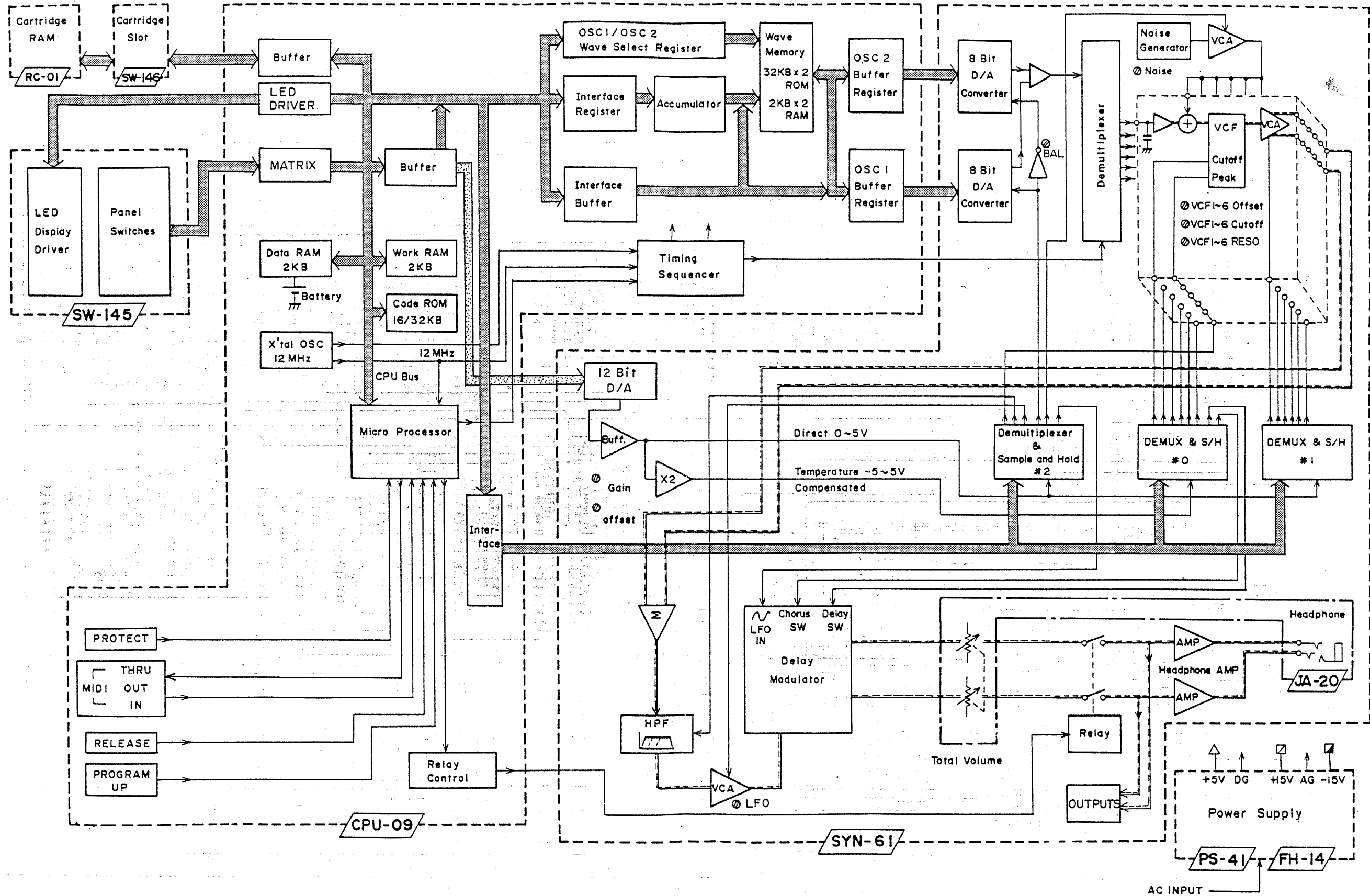


4. BLOCK DIAGRAM



6. [CPU-09] PRINTED CIRCUIT BOARD

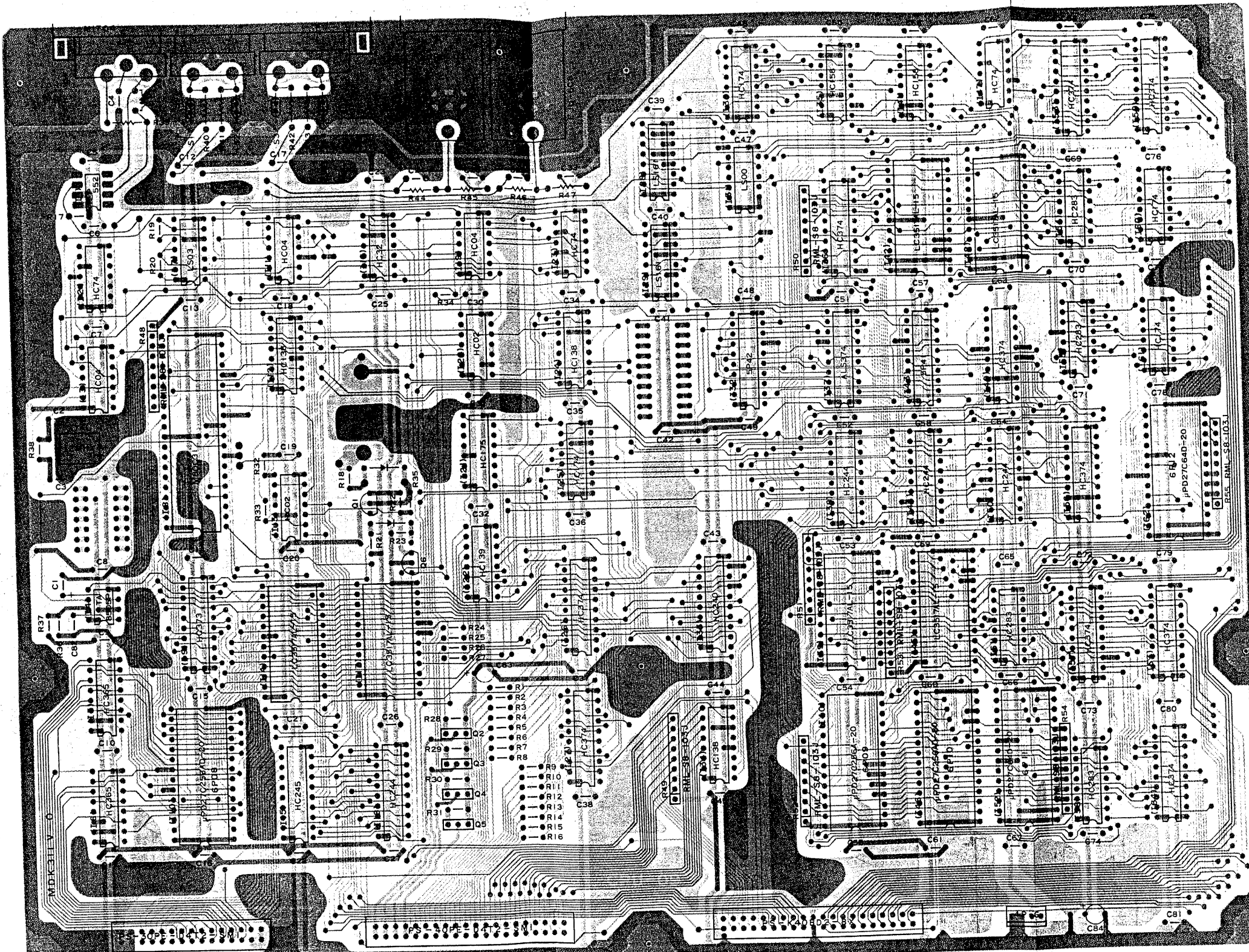
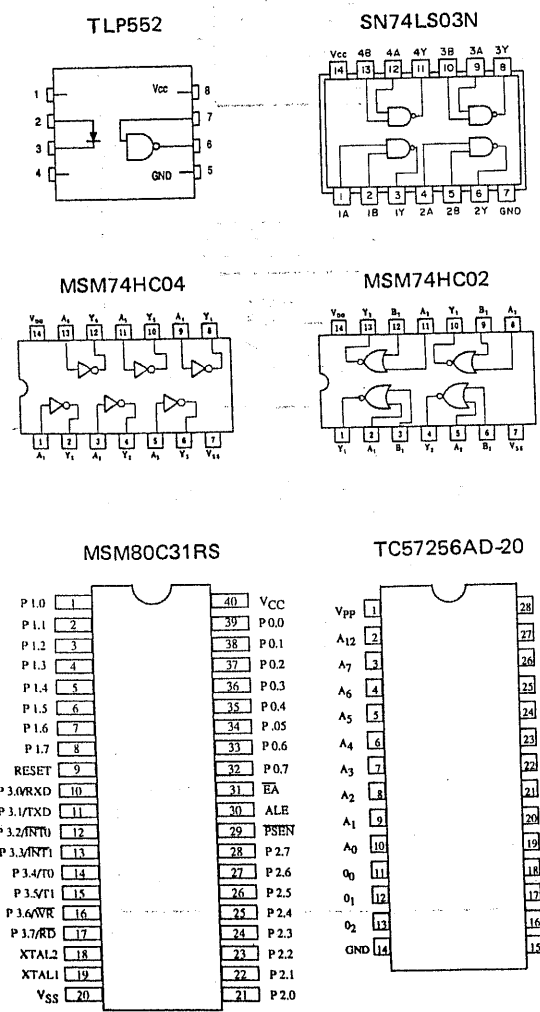
| IC No. | Name | Code No. | Abstract |
|---|----------------------|----------|--|
| 11 | TLP552 | 802361 | Photo Coupler |
| 12, 23, 47 | MSM74HC74 | 802834 | Quad D-Type Flip-Flop with Preset and Clear |
| 13, 11, 19 | MSM74HC04 | 802832 | Hex. Inverter |
| 14 | MSM74HC05 | 802937 | Supply Voltage Supervisor |
| 15, 6 | SN74LS03N | 802936 | Hex. 3-State Bus Buffer (Inverting) |
| 17 | SN74LS03N | 706951 | Quadruple 2-Input Positive NAND Gates |
| 18 | 80C31 | 802824 | CPU |
| 19 | MSM74HC373 | 802842 | Octal D-Type Latch with 3-State Output (Non-Inverting) |
| 110 | 6P08EPROM27C256-20 | 909375 | 32768x8 UV Erasable and Electrically Programmable ROM |
| 112, 24, 34 | MSM74HC138 | 802932 | 3-To-8 Line Decoder |
| 113, 20 | MSM74HC02 | 802931 | Quad 2-Input NOR Gate |
| 114, 17, 39, 42, 45, 48 | LC3617AL-15 | 802938 | 2K x 8 Static RAM |
| 115 | MSM74HC245 | 802935 | Octal 3-State Bus Transceiver |
| 116 | MSM74HC32 | 802833 | Quad 2-Input OR Gate |
| 118, 38, 44, 50 | MSM74HC244 | 802838 | Octal 3-State Bus Buffer |
| 121 | MSM74HC175 | 802933 | Quad D-Type Flip-Flop with Clear |
| 122 | MSM74HC139 | 802835 | Dual 2-To-4 Line Decoder |
| 125, 30, 60, 61 | MSM74HC174 | 802837 | Hex. D-Type Flip-Flop |
| 126, 27, 36, 49, 53, 56, 57, 59, 63, 64 | MSM74HC374 | 802843 | Octal D-Type Flip-Flop with 3-State |
| 128, 29 | 74LS161 | 800756 | Synchronous 4-Bit Counters Binary |
| 131 | 74LS00 | 800720 | Quadruple 2-Input Positive NAND Gates |
| 132 | 5P42A IFL CK2605 | 907531 | Programmable Fuse Logic |
| 133 | MSM74HC240 | 802934 | Inverting Octal 3-State Bus Buffer |
| 135, 41 | MSM74HC158 | 802836 | Quad 2-Channel Multiplexer (Inverting) |
| 137 | 74ALS374 | 802353 | Octal D-Type Flip-Flop |
| 140 | 6P09EPROM27C256-20 | 909380 | |
| 143 | 5P41IFL CK2605 | 907525 | |
| 146 | 6P10 EPROM 27C256-20 | 909385 | |
| 151, 54, 55, 58 | MSM74HC293 | 802840 | 4-Bit Binary Full Adder |
| 152 | 6P11 EPROM 27C64-20 | 909390 | 8K x 8 EP ROM |
| 162 | 6P12 EPROM 27C64-20 | 909395 | |

Transistor

| | | |
|------|---------|--------|
| Q1 | 2SA564R | 708102 |
| Q2-5 | 2SA874R | 802362 |
| Q6 | 2SC331T | 902508 |

Diode

| | | |
|----|---------|--------|
| D1 | DSK-10B | 802998 |
| D2 | MA-700 | 802364 |
| D3 | L78001P | 802940 |



SW-146

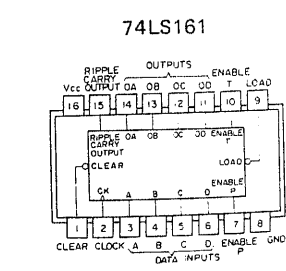
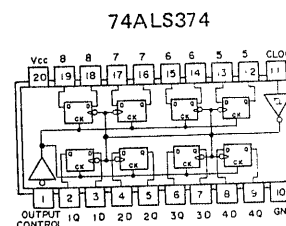
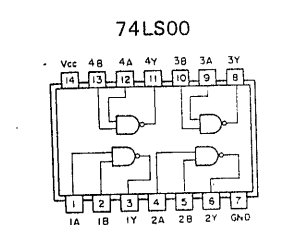
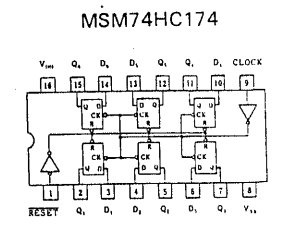
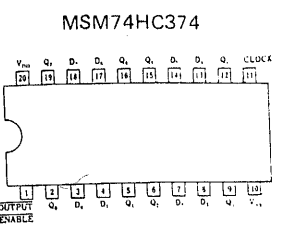
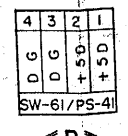
| | | |
|----|-----|------|
| 29 | DG | DG |
| 30 | DG | DG |
| 31 | CWE | CCE |
| 32 | CD2 | COE |
| 33 | CD1 | CD3 |
| 34 | CA0 | CD4 |
| 35 | CA1 | CD5 |
| 36 | CA2 | CD6 |
| 37 | CA3 | CD7 |
| 38 | CA4 | CA3 |
| 39 | CA5 | CA10 |
| 40 | CA6 | CA9 |
| 41 | CA7 | CAB |
| 42 | +5D | AME |
| 43 | +5D | N |

SW-145

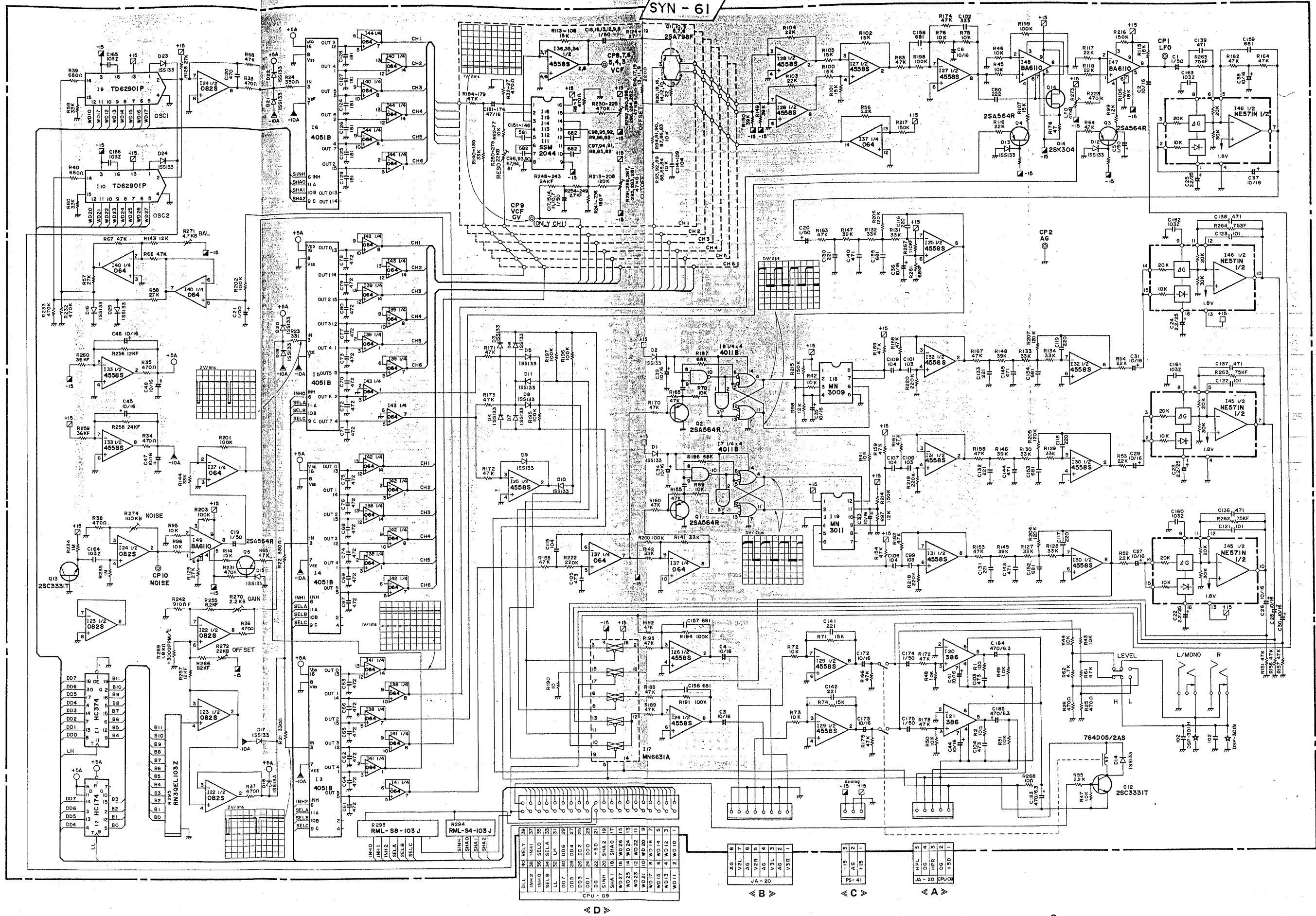
| | | |
|----|------|------|
| 39 | LEDO | LEDO |
| 40 | LED1 | LED1 |
| 41 | LED2 | LED2 |
| 42 | LED3 | LED3 |
| 43 | SA7 | SA6 |
| 44 | SA5 | SA4 |
| 45 | SA3 | SA2 |
| 46 | SA1 | SA0 |
| 47 | SB7 | SB6 |
| 48 | SB5 | SB4 |
| 49 | SB3 | SB2 |
| 50 | SB1 | SB0 |
| 51 | PD7 | PD6 |
| 52 | PD5 | PD4 |
| 53 | PD3 | PD2 |
| 54 | PD1 | PD0 |
| 55 | PA7 | PA6 |
| 56 | PA5 | PA4 |
| 57 | PA3 | PA2 |
| 58 | PA1 | PA0 |

SW-61/PS-4

| | | |
|----|------|------|
| 39 | RELY | INH1 |
| 40 | INH2 | SELB |
| 41 | SELB | SELB |
| 42 | LL | LH |
| 43 | DD5 | DD4 |
| 44 | DD3 | DD2 |
| 45 | DD1 | DD0 |
| 46 | DG | +5D |
| 47 | SINH | SHA2 |
| 48 | SHAO | SHA1 |
| 49 | WD27 | WD26 |
| 50 | WD25 | WD24 |
| 51 | WD23 | WD22 |
| 52 | WD21 | WD20 |
| 53 | WD17 | WD16 |
| 54 | WD15 | WD14 |
| 55 | WD13 | WD12 |
| 56 | WD11 | WD10 |



7. [SYN-61] CIRCUIT

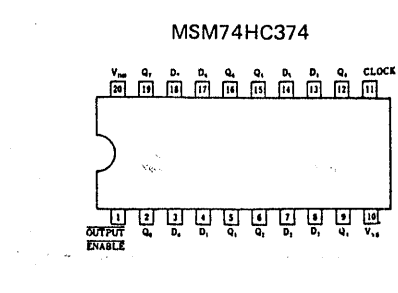
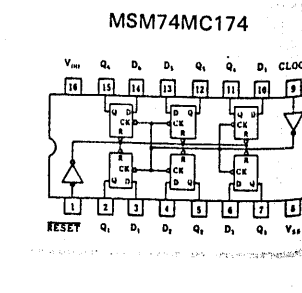
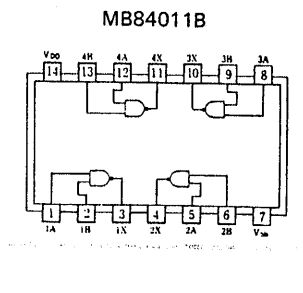
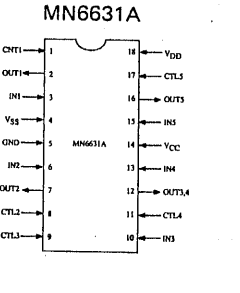
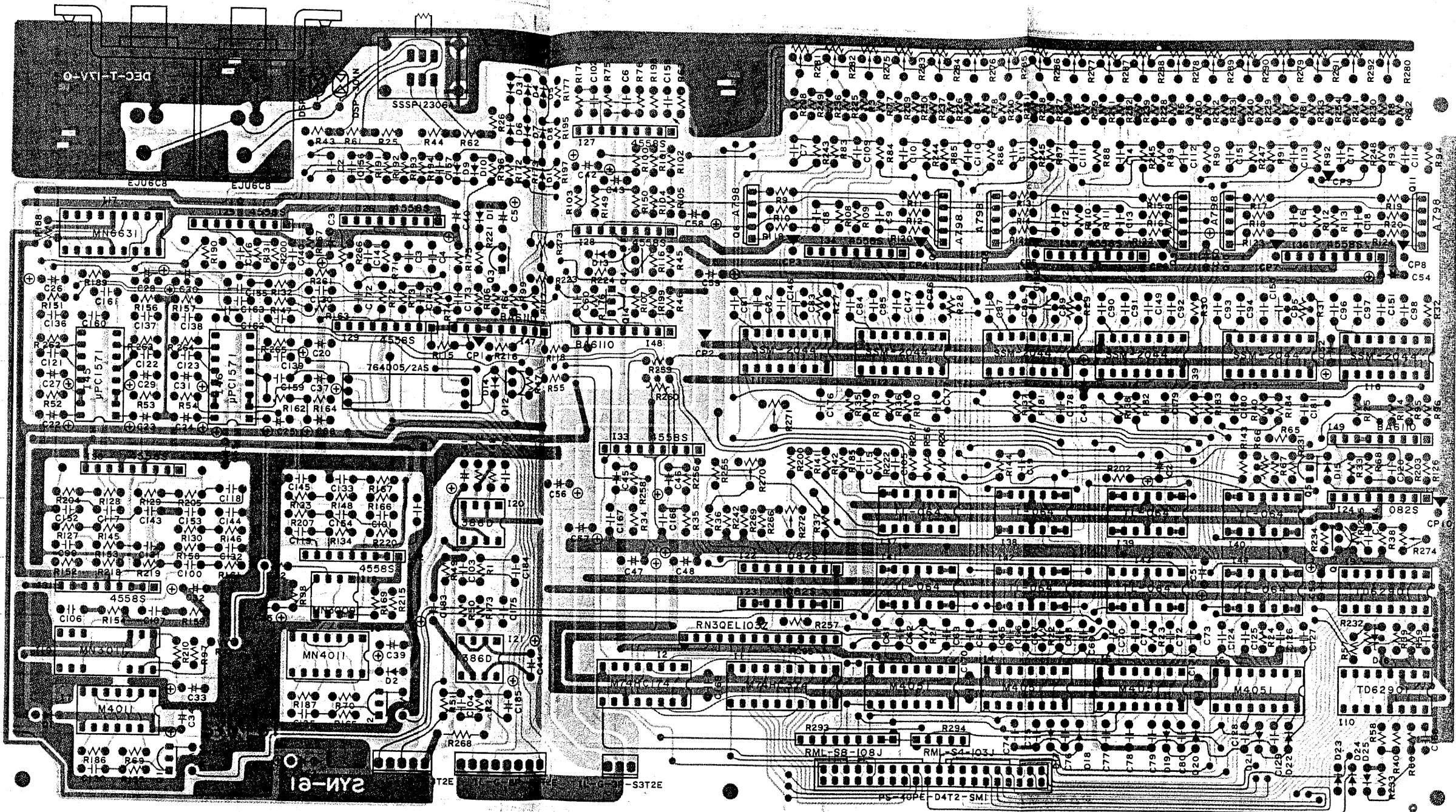
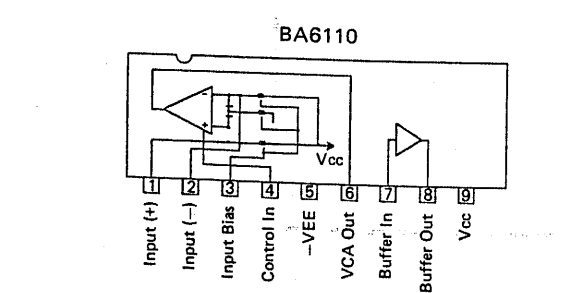
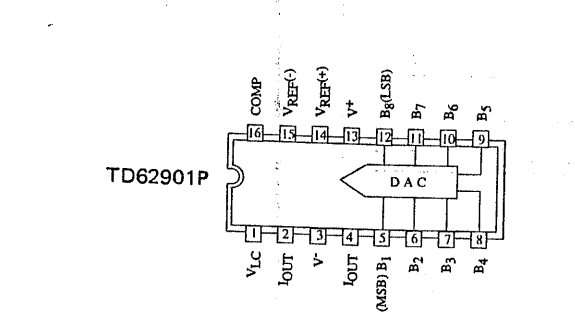
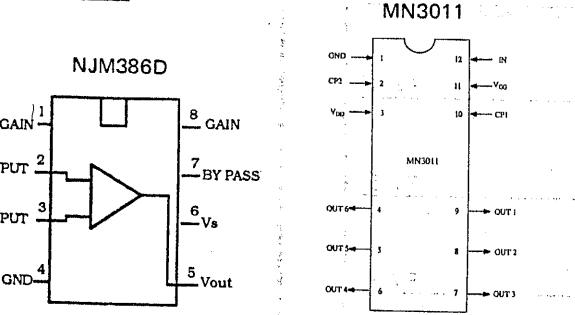
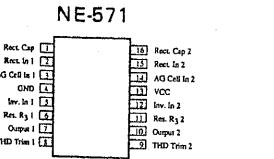
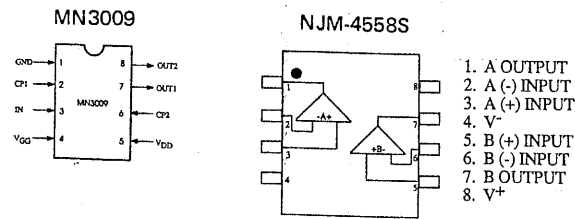


8. [SYN-61] PRINTED CIRCUIT BOARD

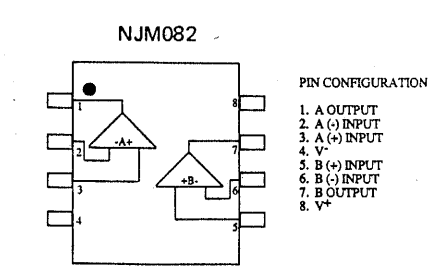
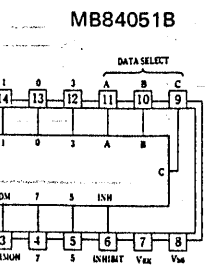
| IC No. | Name | Code No. | Abstract |
|-------------|------------|----------|--|
| I1 | MSM74HC374 | 802843 | Octal D-Type Flip-Flop with 3-State |
| I2 | MSM74HC174 | 802837 | Hex. D-Type Flip-Flop |
| I3-6 | MB84011B | 706984 | Single 8-Channel Multiplexer/Demultiplexer |
| I7, 8 | MB84011B | 706982 | Quad 2-Input Positive NAND Gate |
| I9, 10 | TD62901P | 802357 | 8-Bit D/A Converter |
| I11-16 | SSMT2044 | 800058 | 4-Pole D/A Converter |
| I17 | MN6631A | 802360 | 5-Channel Voltage Controlled Filter |
| I18 | MN3009 | 706071 | BBD |
| I19 | MN3011 | 802359 | BBD |
| I20, 21 | NJM-386D | 707005 | Audio Power Amplifier |
| I22, 23, 24 | NJM-4558S | 800744 | OP Amplifier |
| I25-36 | NJM-4558S | 802939 | OP Amplifier |
| I37-44 | TA75064P | 802939 | Quad OP-Amp |
| I45, 46 | NE-571 | 800082 | Compassator |
| I47-49 | BA6110 | 706937 | OP Amplifier |

| Transistor | Part No. | Code No. |
|------------|----------|----------|
| Q1-5 | 2SA564R | 706102 |
| Q6-11 | 2SA798F | 706124 |
| Q12, 13 | 2SC331T | 802508 |
| Q14 | 2SK304 | |

| Diode | Part No. | Code No. |
|-------|----------|----------|
| D1-25 | 1SS133 | 800625 |



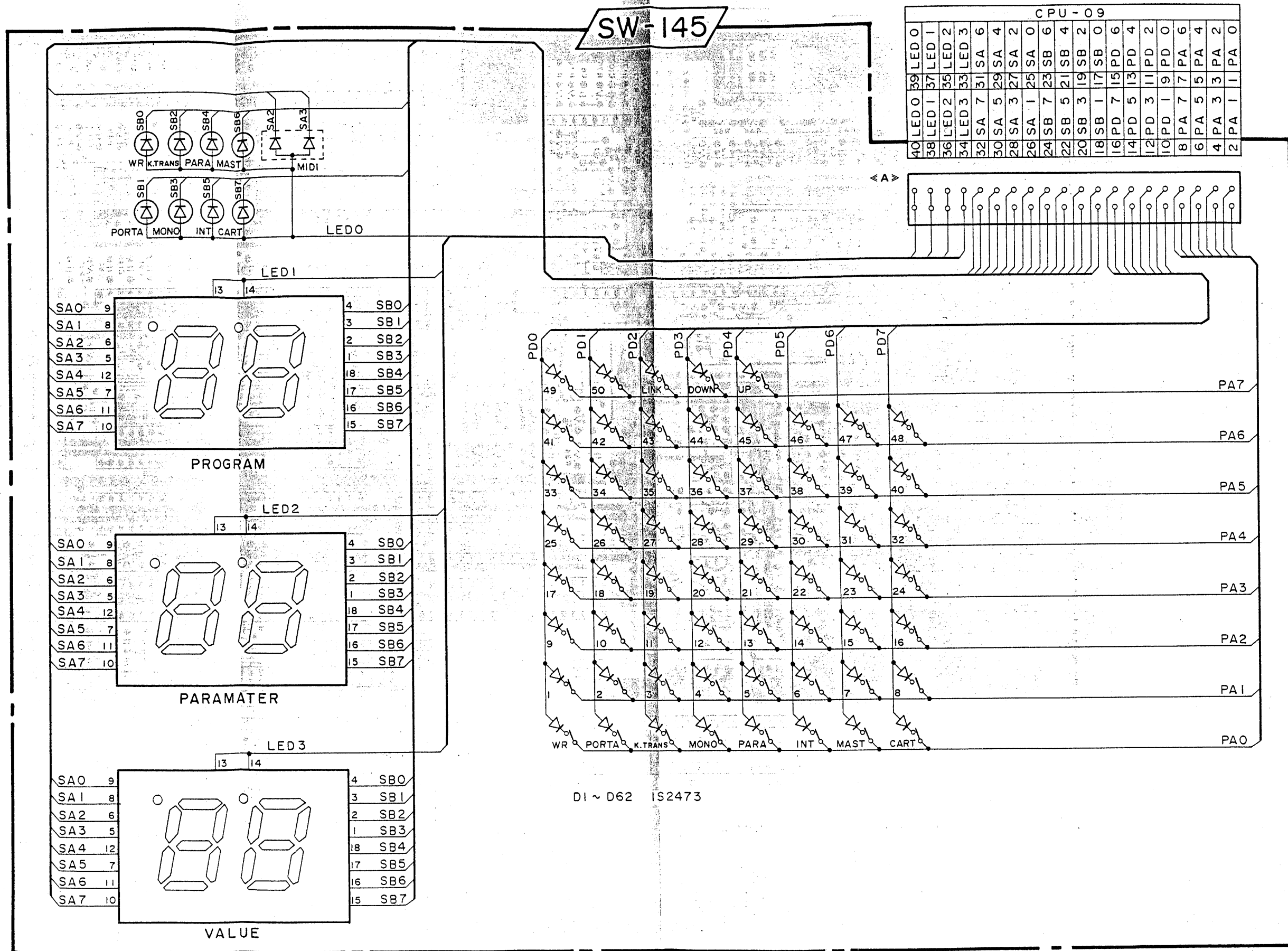
| Pin | Signal |
|-----|--------|
| 39 | RELY |
| 38 | INH2 |
| 37 | INH1 |
| 36 | SELO |
| 35 | SELA |
| 34 | SELB |
| 33 | LL |
| 32 | LH |
| 31 | DD7 |
| 30 | DD6 |
| 29 | DD5 |
| 28 | DD4 |
| 27 | DD3 |
| 26 | DD2 |
| 25 | DD1 |
| 24 | DD0 |
| 23 | DD |
| 22 | +5D |
| 21 | SHA2 |
| 20 | SHA1 |
| 19 | SHAO |
| 18 | WD27 |
| 17 | WD26 |
| 16 | WD25 |
| 15 | WD24 |
| 14 | WD23 |
| 13 | WD22 |
| 12 | WD21 |
| 11 | WD20 |
| 10 | WD19 |
| 9 | WD18 |
| 8 | WD17 |
| 7 | WD16 |
| 6 | WD15 |
| 5 | WD14 |
| 4 | WD13 |
| 3 | WD12 |
| 2 | WD11 |
| 1 | WD10 |



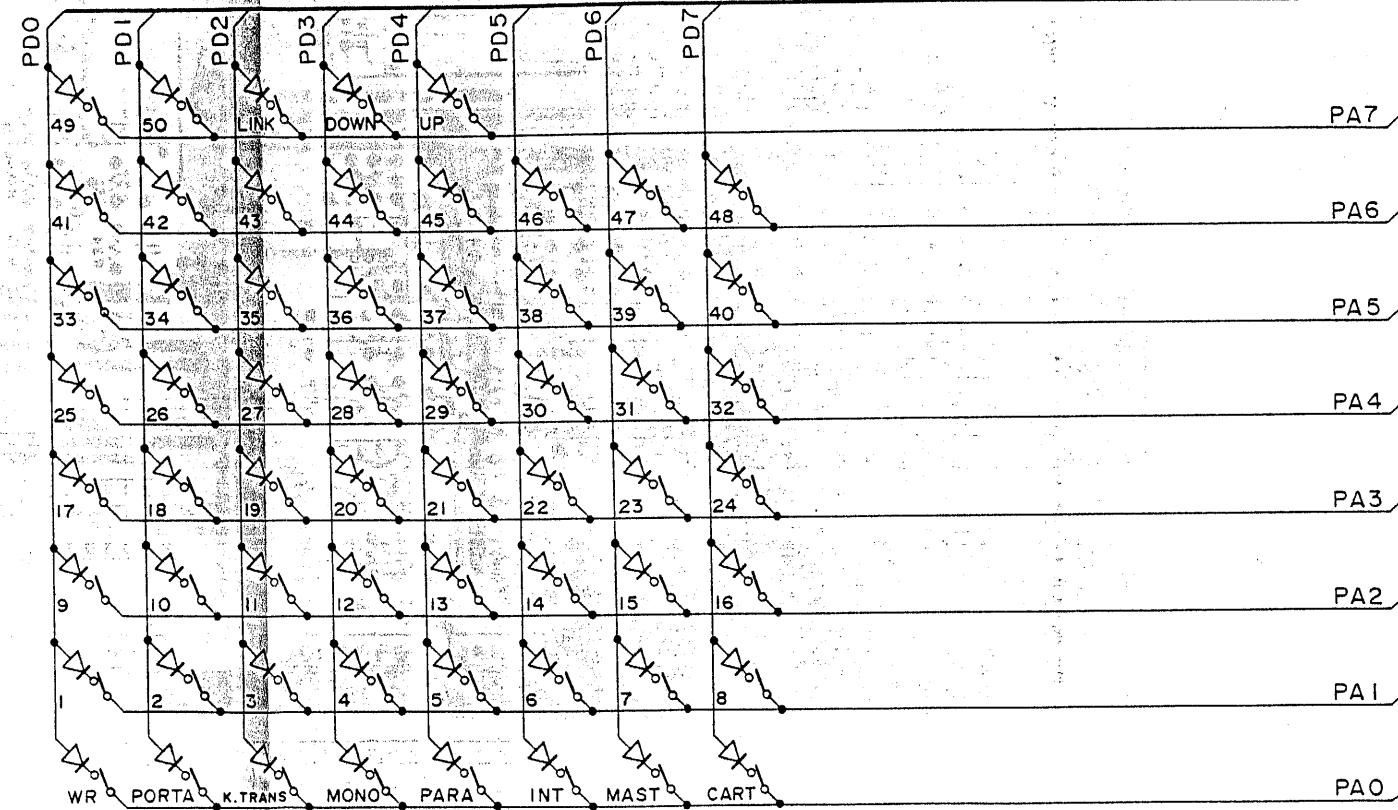
- PIN CONFIGURATION
1. A OUTPUT
 2. A (-) INPUT
 3. A (+) INPUT
 4. V-
 5. B (+) INPUT
 6. B (-) INPUT
 7. B OUTPUT
 8. V+

9. [SW-145] CIRCUIT

SW-145

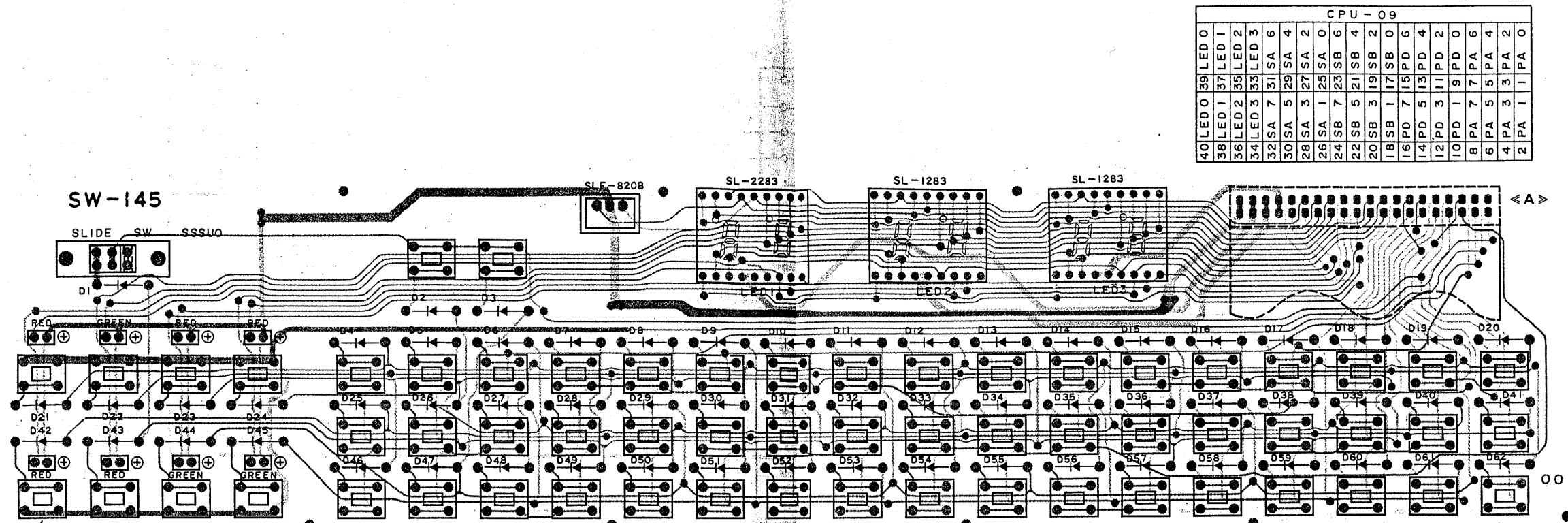


| | | | |
|----|------|----|------|
| 40 | LED0 | 39 | LED0 |
| 38 | LED1 | 37 | LED1 |
| 36 | LED2 | 35 | LED2 |
| 34 | LED3 | 33 | LED3 |
| 32 | SA 7 | 31 | SA 6 |
| 30 | SA 5 | 29 | SA 4 |
| 28 | SA 3 | 27 | SA 2 |
| 26 | SA 1 | 25 | SA 0 |
| 24 | SB 7 | 23 | SB 6 |
| 22 | SB 5 | 21 | SB 4 |
| 20 | SB 3 | 19 | SB 2 |
| 18 | SB 1 | 17 | SB 0 |
| 16 | PD 7 | 15 | PD 6 |
| 14 | PD 5 | 13 | PD 4 |
| 12 | PD 3 | 11 | PD 2 |
| 10 | PD 1 | 9 | PD 0 |
| 8 | PA 7 | 7 | PA 6 |
| 6 | PA 5 | 5 | PA 4 |
| 4 | PA 3 | 3 | PA 2 |
| 2 | PA 1 | 1 | PA 0 |



DI ~ D62 IS2473

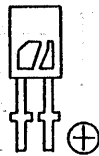
10. [SW-145] PRINTED CIRCUIT BOARD



| C P U | | I O | |
|-------|------|-----|------|
| 40 | LED0 | 39 | LED0 |
| 38 | LED1 | 37 | LED1 |
| 36 | LED2 | 35 | LED2 |
| 34 | LED3 | 33 | LED3 |
| 32 | SA | 31 | SA |
| 30 | SA | 29 | SA |
| 28 | SA | 27 | SA |
| 26 | SA | 25 | SA |
| 24 | SB | 23 | SB |
| 22 | SB | 21 | SB |
| 20 | SB | 19 | SB |
| 18 | SB | 17 | SB |
| 16 | PD | 15 | PD |
| 14 | PD | 13 | PD |
| 12 | PD | 11 | PD |
| 10 | PD | 9 | PD |
| 8 | PA | 7 | PA |
| 6 | PA | 5 | PA |
| 4 | PA | 3 | PA |
| 2 | PA | 1 | PA |

TACT SW
62T-14

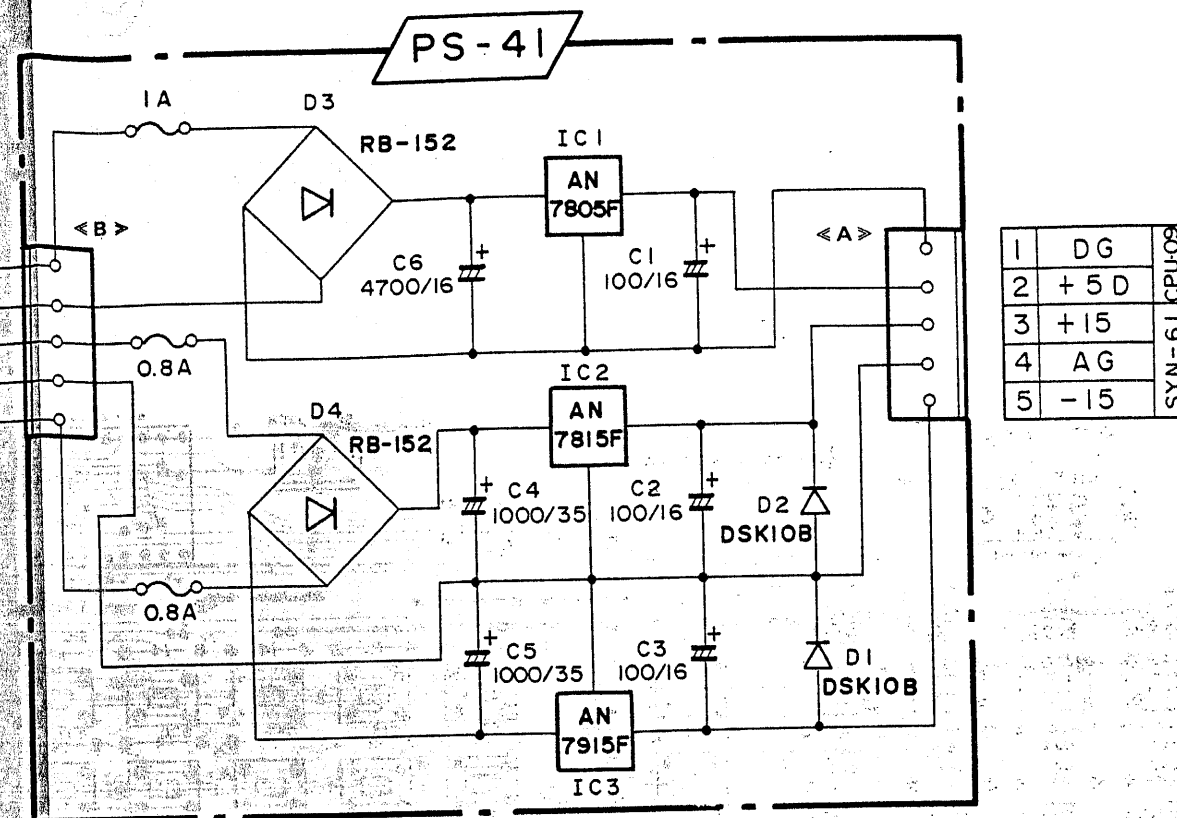
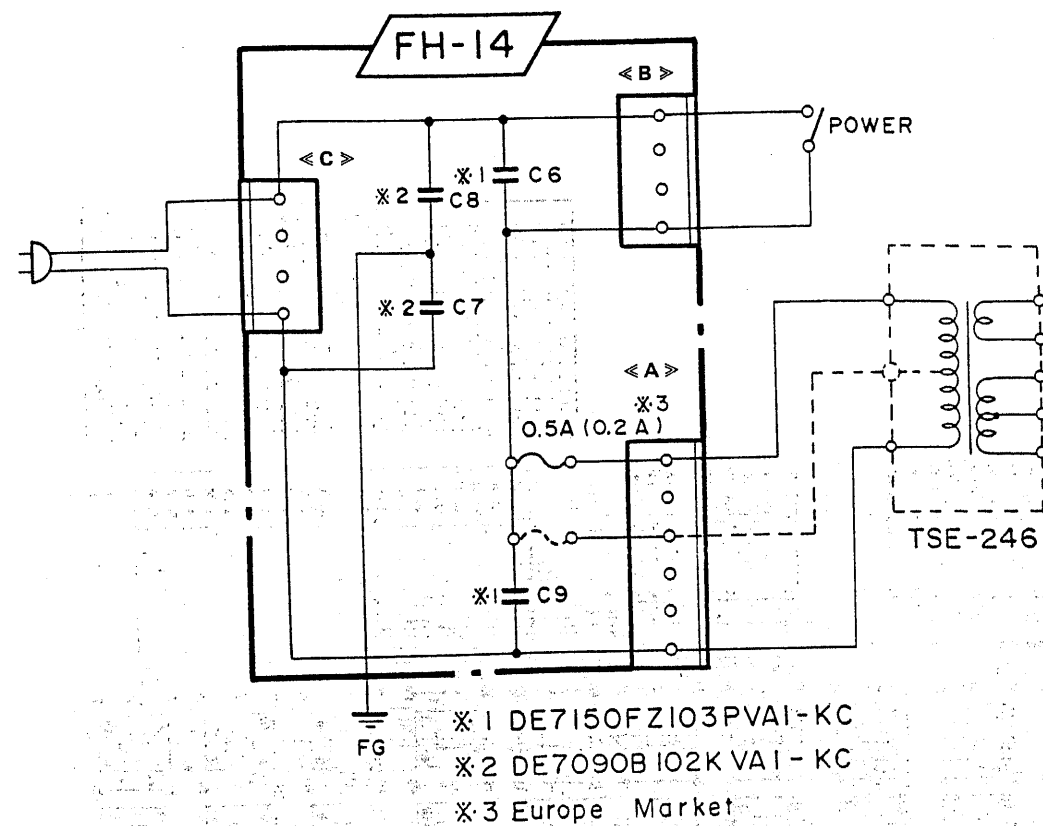
■ Polarity of LED
(SLP-955C-50, SLP-255F-50U)



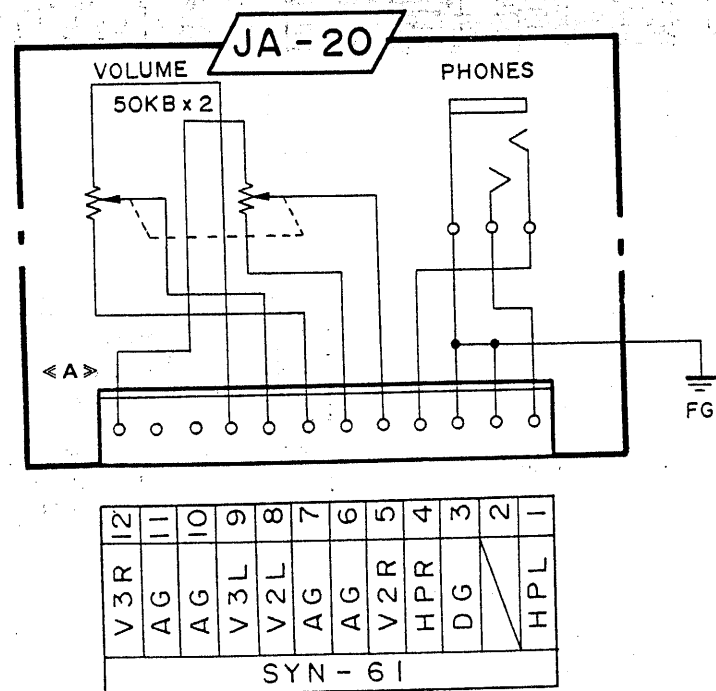
[Diode]

| No. | Name | Code No. |
|-------------|--------------|----------|
| LED1 | SL-2283 | 802941 |
| LED2, 3 | SL-1283 | 802942 |
| D1 ~ 62 | 1S2473 | 706317 |
| MIDI | SLF-820B | 802945 |
| LED (RED) | SLP-955C-50 | 802944 |
| LED (GREEN) | SLP-255F-50U | 802943 |

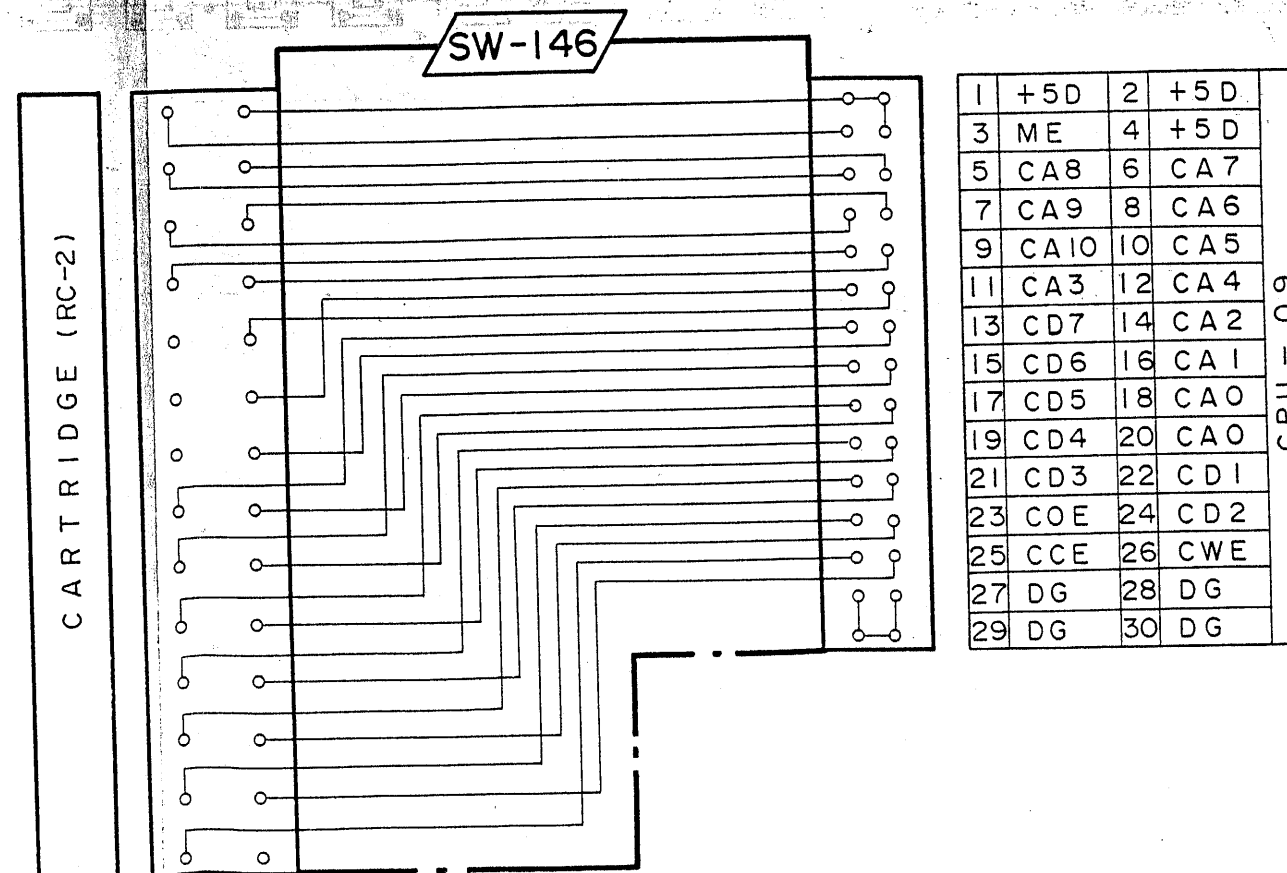
11. [FH-14], [PS-41], [JA-20], [SW-146] CIRCUIT



| | | |
|---|-----|--------------|
| 1 | DG | SYN-61 CPU08 |
| 2 | +5D | |
| 3 | +15 | |
| 4 | AG | |
| 5 | -15 | |

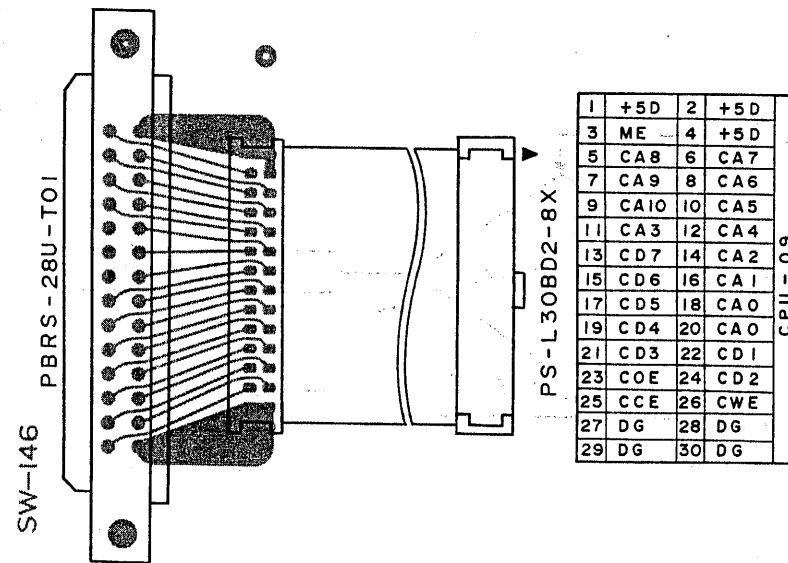
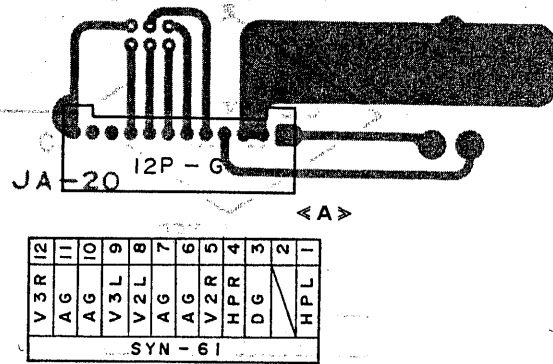
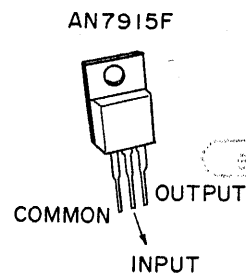
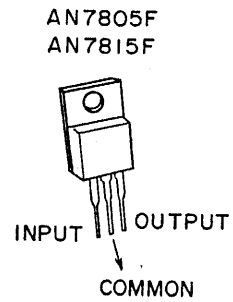
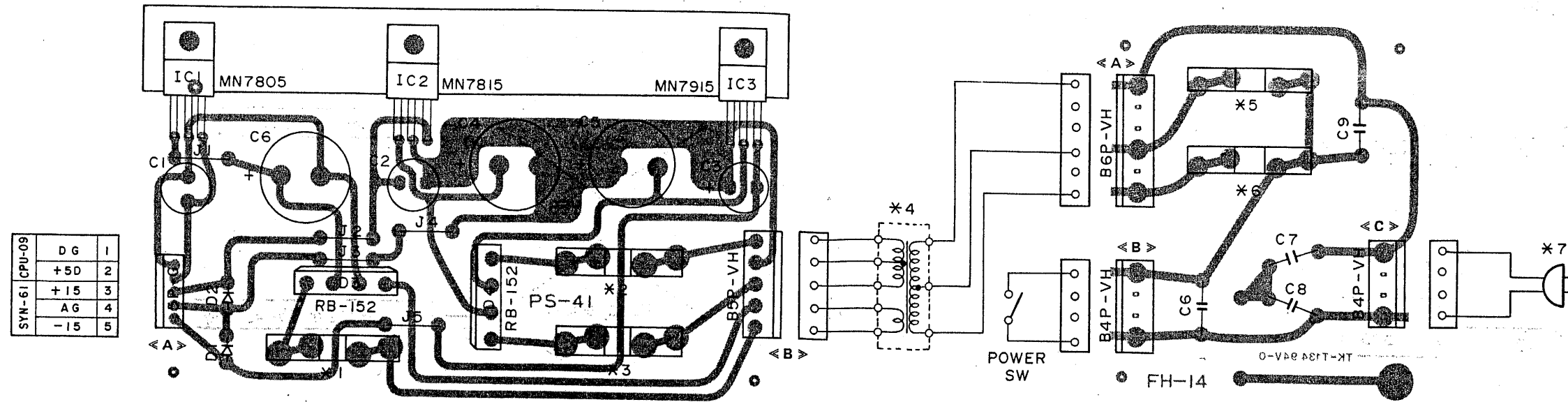


| | |
|--------|----|
| V3R | 12 |
| AG | 11 |
| AG | 10 |
| V3L | 9 |
| V2L | 8 |
| AG | 7 |
| AG | 6 |
| V2R | 5 |
| HPR | 4 |
| DG | 3 |
| HPL | 2 |
| SYN-61 | |



| | | | |
|----|------|----|-----|
| 1 | +5D | 2 | +5D |
| 3 | ME | 4 | +5D |
| 5 | CA8 | 6 | CA7 |
| 7 | CA9 | 8 | CA6 |
| 9 | CA10 | 10 | CA5 |
| 11 | CA3 | 12 | CA4 |
| 13 | CD7 | 14 | CA2 |
| 15 | CD6 | 16 | CA1 |
| 17 | CD5 | 18 | CA0 |
| 19 | CD4 | 20 | CA0 |
| 21 | CD3 | 22 | CD1 |
| 23 | COE | 24 | CD2 |
| 25 | CCE | 26 | CWE |
| 27 | DG | 28 | DG |
| 29 | DG | 30 | DG |

12. [FH-14], [PS-41], [JA-20], [SW-146] PRINTED CIRCUIT BOARD



| Description | Japan | General | U.S.A. | Canada | NE |
|----------------------|----------------|--------------------|-------------------|-------------------|-------------------|
| *1 Fuse | 1.0A | 1.0A | 1.0A-250V | 1.0A-250V | T-1.0A |
| *2 Fuse | 0.8A | 0.8A | 0.8A-250V | 0.8A-250V | T-0.8A |
| *3 Fuse | 0.8A | 0.8A | 0.8A-250V | 0.8A-250V | T-0.8A |
| *4 Power Transformer | TSE-246-D | | TSE-246-U | | |
| *5 Fuse | - | 0.5A | - | - | T-0.5A |
| *6 Fuse | 0.5A | 0.5A | 0.5A-250V | 0.5A-250V | T-0.5A |
| *7 AC Cord | | | | | |
| C6~9 Capacitor | DEFZ103PVA1-KC | DE7150FZ103PVA1-KC | DE7150FZ103PVI-KC | DE7150FZ103PVI-KC | DE7150FZ103PVI-KC |

[IC]

| IC No. | Name | Code No. | Abstract |
|--------|---------|----------|----------------------------|
| IC1 | AN7805F | 802888 | Positive Voltage Regulator |
| IC2 | AN7815F | 802889 | Positive Voltage Regulator |
| IC3 | AN7915F | 802890 | Negative Voltage Regulator |

[Diode]

| | | |
|-------|--------|--------|
| D1, 2 | DSK10B | 802898 |
| D3, 4 | RB-152 | 706319 |

13. TROUBLESHOOTING GUIDE

