

TANDY[®]

Service Manual

25-1000

Supplement to the Tandy[®] 1000

Service Manual

(Cat. No. 25-1000)

CUSTOM MANUFACTURED FOR RADIO SHACK, A DIVISION OF TANDY CORPORATION

Supplement to the Tandy® 1000 Service Manual

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1/ Introduction

The Tandy 1000A logic board was primarily implemented as a cost reduction of the original design. The only changes to the user features were the addition of a socket to support the 8087 numeric co-processor, the addition of a service adjustable sound volume control, and the addition of a software control bit to disable the internal speaker. However, the visual appearance of the board is considerably different. The original 4 layer circuit board has now been replaced with a 2 layer board, and the IC count has been reduced to 73 IC's.

These changes to the main logic board were accomplished by the addition of three new custom circuits. For your convenience in understanding the operation of both versions of the circuit board, a copy of the original schematic, schematic 8000226, is included, indicating the logic replaced by each of the new custom circuits. Also, a description of the operation of each new custom circuit follows.

2/ Custom Circuits

Custom Address Array

The Custom Address Array (Part No. 8079010) is a 68 PLCC that replaces all of the video address generation logic on sheet 3 of the schematic 8000226. Also, this device incorporates the address decode logic from sheet 5 and sheet 6 of schematic 8000226, and all of sheet 7, except for the 74LS245 data buffer and one 74LS32 OR gate. A pin-out description of the device is given in Figure 1.

Functionally this device is identical to the logic replaced on the original design and the description of the operation of this logic will not be repeated. One new feature has been added to the Custom Address Array circuitry; however, this feature is not used on the present main logic board design. An extra memory address line (MA8) was added to allow the use of 256K x 1 RAM chips. Also, a new control port was added at I/O address 3DD, to control the operation with 256K x 1 RAM chips. The bit definition of this new control port is listed below.

CONTROL PORT 3DD

| | |
|-------|------------------------------|
| Bit 0 | Reserved |
| Bit 1 | Reserved |
| Bit 2 | Reserved |
| Bit 3 | Video address 17 |
| Bit 4 | Video address 18 |
| Bit 5 | CPU address 17 |
| Bit 6 | CPU address 18 |
| Bit 7 | Select 256K RAMs; 0=64K RAMs |

This control port is cleared during a reset, and should not be changed.

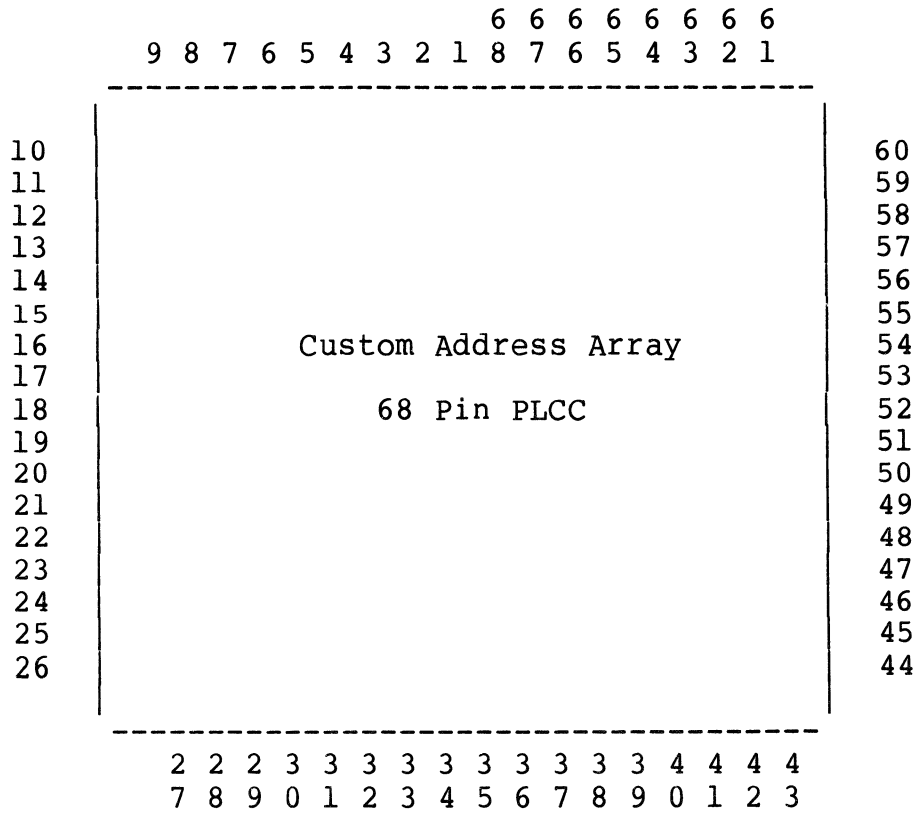


Figure 1.1 Pin List

TANDY COMPUTER PRODUCTS

| PIN# | PIN NAME | TYPE | DESCRIPTION |
|------|----------|--------------|--|
| ---- | ----- | ---- | ----- |
| 1 | VDD | POWER | +5 VOLTS |
| 2 | IOD1 | INPUT/OUTPUT | DATA BUS BIT 1 |
| 3 | IOD0 | INPUT/OUTPUT | DATA BUS BIT 0 |
| 4 | HSYNC | OUTPUT | 6845 HORIZONTAL SYNC |
| 5 | VSYNC | OUTPUT | 6845 VERTICAL SYNC |
| 6 | A* | OUTPUT | ENCODED PERIPHERAL ADDRESS SELECT (LSB) |
| 7 | B* | OUTPUT | ENCODED PERIPHERAL ADDRESS SELECT |
| 8 | C* | OUTPUT | ENCODED PERIPHERAL ADDRESS SELECT (MSB) |
| 9 | IOSEL* | OUTPUT | I/O SELECT |
| 10 | LPSW* | INPUT | LIGHT PEN SET (ACTIVE LOW) |
| 11 | RA0 | OUTPUT | 6845 ROW ADDRESS 0 |
| 12 | RA1 | OUTPUT | 6845 ROW ADDRESS 1 |
| 13 | RA2 | OUTPUT | 6845 ADDRESS 2 |
| 14 | RA3 | OUTPUT | 6845 ADDRESS 3 |
| 15 | GACS* | OUTPUT | |
| 16 | MEMSEL* | OUTPUT | |
| 17 | VS* | OUTPUT | |
| 18 | ROMCS* | OUTPUT | ROM CHIP SELECT |
| 19 | IO/M | INPUT | I/O /MEMORY |
| 20 | BMEMW* | INPUT | MEMORY WRITE |
| 21 | BMEMR* | INPUT | MEMORY READ |
| 22 | RFSH* | INPUT | MEMORY REFRESH |
| 23 | BA19 | INPUT | ADDRESS 19 |
| 24 | BA18 | INPUT | ADDRESS 18 |
| 25 | BA17 | INPUT | ADDRESS 17 |
| 26 | BA16 | INPUT | ADDRESS 16 |
| 27 | BA15 | INPUT | ADDRESS 15 |
| 28 | BA14 | INPUT | ADDRESS 14 |
| 29 | BA13 | INPUT | ADDRESS 13 |
| 30 | BA12 | INPUT | ADDRESS 12 |
| 31 | BA11 | INPUT | ADDRESS 11 |
| 32 | BA10 | INPUT | ADDRESS 10 |
| 33 | CCLK* | INPUT | 6845 CLK |
| 34 | VSS | GROUND | GROUND |

Figure 1.2 Description of each Pin Function

TANDY COMPUTER PRODUCTS

| | | | |
|----|----------|--------------|--|
| 35 | BA09 | INPUT | ADDRESS 9 |
| 36 | BA08 | INPUT | ADDRESS 8 |
| 37 | BA07 | INPUT | ADDRESS 7 |
| 38 | BA06 | INPUT | ADDRESS 6 |
| 39 | BA05 | INPUT | ADDRESS 5 |
| 40 | BA04 | INPUT | ADDRESS 4 |
| 41 | BA03 | INPUT | ADDRESS 3 |
| 42 | BA02 | INPUT | ADDRESS 2 |
| 43 | BA01 | INPUT | ADDRESS 1 |
| 44 | BA00 | INPUT | ADDRESS 0 |
| 45 | LPIN | INPUT | LIGHT PEN IN |
| 46 | MA0 | OUTPUT | MEMORY ADDRESS 0 |
| 47 | MA1 | OUTPUT | MEMORY ADDRESS 1 |
| 48 | MA2 | OUTPUT | MEMORY ADDRESS 2 |
| 49 | MA3 | OUTPUT | MEMORY ADDRESS 3 |
| 50 | MA4 | OUTPUT | MEMORY ADDRESS 4 |
| 51 | MA5 | OUTPUT | MEMORY ADDRESS 5 |
| 52 | MA6 | OUTPUT | MEMORY ADDRESS 6 |
| 53 | MA7 | OUTPUT | MEMORY ADDRESS 7 |
| 54 | MA8 | OUTPUT | MEMORY ADDRESS 8 |
| 55 | CPU*/CRT | INPUT | CPU /CRT SELECT FOR MA0-8 |
| 56 | RAS* | INPUT | UPPER /LOWER ADDRESS SELECT FOR MA0-8 |
| 57 | CURSOR | OUTPUT | 6845 CURSOR |
| 58 | DISPEN | OUTPUT | 6845 DISPEN |
| 59 | NMIEN | OUTPUT | NON-MASKABLE INTERRUPT ENABLE |
| 60 | SYSRST* | INPUT | SYSTEM RESET |
| 61 | BIOW* | INPUT | I/O WRITE |
| 62 | BIOR* | INPUT | I/O READ |
| 63 | IOD7 | INPUT/OUTPUT | DATA BUS BIT 7 |
| 64 | IOD6 | INPUT/OUTPUT | DATA BUS BIT 6 |
| 65 | IOD5 | INPUT/OUTPUT | DATA BUS BIT 5 |
| 66 | IOD4 | INPUT/OUTPUT | DATA BUS BIT 4 |
| 67 | IOD3 | INPUT/OUTPUT | DATA BUS BIT 3 |
| 68 | IOD2 | INPUT/OUTPUT | DATA BUS BIT 2 |

FIGURE 1.2 (con't)

Custom Timing Generator Array

The Custom Timing Generator Array (Part No. 8079011) functionally replaces the circuitry found on schematic 8000226, sheet 1 (bottom) and sheet 2. Referring to the enclosed block diagram of the Custom Timing Generator (Figure 2), the top block is MEMORY TIMING, GENERATOR, which is described in the Tandy 1000 service manual under "OSCILLATOR TIMING, AND DYNAMIC RAM CONTROL" page 20. The timing is unchanged.

The second, third, and fourth block represent the 8284. This is described in the service manual under CPU CONTROL SIGNAL GEN. CPUOSC input is connected to CLK14M. RD41N replaces RD41, RD42, AEN1, and AEN2. The 10WAIT signal is generated internally.

The fifth block represents the CONTROL SIGNAL GENERATION which is described in the service manual page 26 under "SYSTEM CONTROL SIGNAL GENERATION." The difference here is that with the Custom Timing Generator, the 8088 is operating in the "MAX MODE." Thus the status signal "SSO, IO/M, DT/R are replaced by S0B, S1B, S2B which tri-state during T4 instead of changing at ALE. This requires a revision to timing diagram (page 27 of the service manual as provided in Figure 4).

The final block is the ARBITER which interfaces the 8088 in "MAX MODE" with the current "HOLD, HLDA" signals on the bus. Since this circuit is new, a description follows.

In the "MAX MODE" the 8088 uses two REQUEST/GRANT signals, RT/GT0 and RT/GT1, which are bi-directional. The operational sequence of the ARBITER is as follows: When the HOLD input goes true, a negative-going request pulse is sent to the 8088 via the RT/GT pin (used as an output at this time). RT/GT now functions as an input to the Custom Timing Generator, which is waiting for a negative-going "GRANT" signal from the 8088. When the GRANT is received the bus signal HLDA is set. When the bus signal HOLD goes false, the RT/GT line again functions as an output, sending the third RT/GT pulse, "RELEASE", to the 8088. (See 8088 specifications for details). Enclosed is an additional timing diagram for ARBITER.

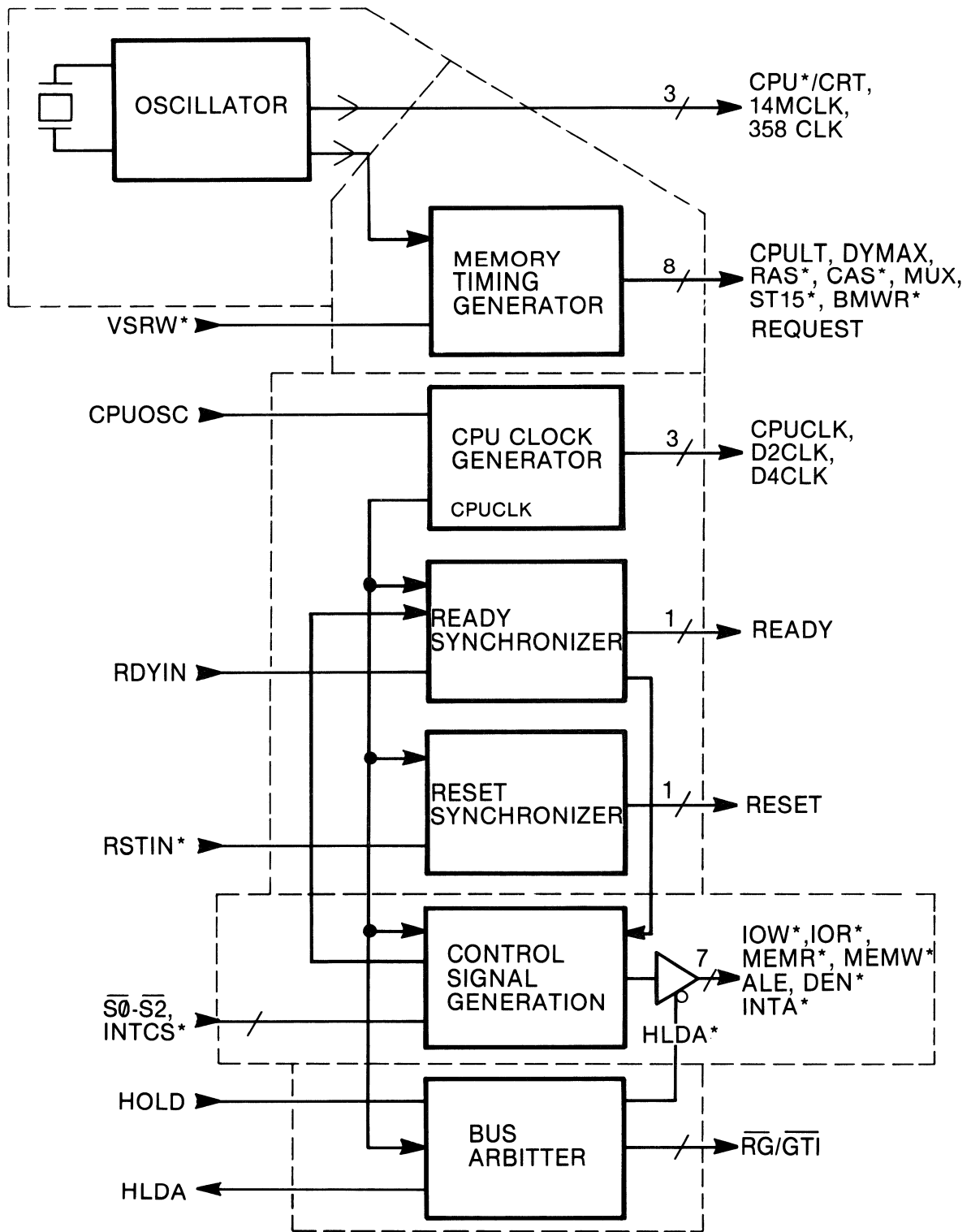


Figure 2 Custom Timing Generator Array Block Diagram

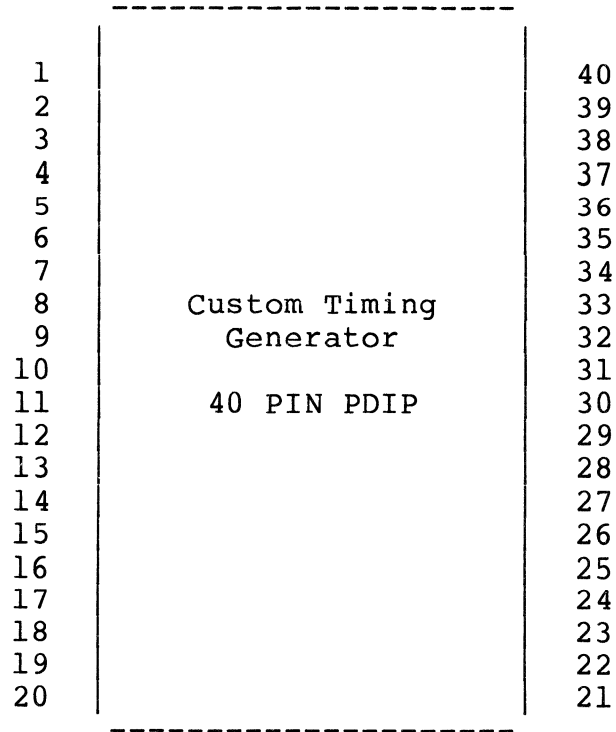


Figure 3.1 Pin List

TANDY COMPUTER PRODUCTS

| PIN# | PIN NAME | TYPE | DESCRIPTION |
|------|----------|--------|---------------------------------------|
| ---- | ----- | ---- | ----- |
| 1 | D2CLK | OUTPUT | CPUCLK DEVIDE BY 2 |
| 2 | D4CLK | OUTPUT | CPUCLK DEVIDE BY 4 |
| 3 | RESET | OUTPUT | SYNC. RESET OUT |
| 4 | IOB/M | OUTPUT | MEMORY NOT I/O |
| 5 | READY | OUTPUT | SYNC. SYSTEM READY |
| 6 | ALE | OUTPUT | ADDRESS LATCH ENABLE |
| 7 | INTCSB | INPUT | INTERRUPT CHIP SELECT |
| 8 | DENB | OUTPUT | CPU DATA ENABLE |
| 9 | MEMRB | OUTPUT | CPU MEMORY READ |
| 10 | INTAB | OUTPUT | CPU INTERRUPT ACKNOWLEDGE |
| 11 | MEMWB | OUTPUT | CPU MEMORY WRITE |
| 12 | IOWB | OUTPUT | CPU I/O WRITE |
| 13 | IORB | OUTPUT | CPU I/O READ |
| 14 | READ | OUTPUT | CPU READ |
| 15 | RDYIN | INPUT | ASYNC. READY |
| 16 | S0B | INPUT | CPU STATUS 0 |
| 17 | S1B | INPUT | CPU STATUS 1 |
| 18 | S2B | INPUT | CPU STATUS 2 |
| 19 | CPUOSC | INPUT | CPU OSC INPUT |
| 20 | VSS | GROUND | GROUND |
| 21 | RSTINB | INPUT | ASYNC. RESET INPUT |
| 22 | XTALIN | INPUT | 28 MHZ CRYSTAL INPUT |
| 23 | XTALOUT | OUTPUT | 28 MHZ CRYSTAL OUTPUT |
| 24 | VSACCB | INPUT | MEMORY ADDRESS DECODE |
| 25 | CLK14M | OUTPUT | 14 MHZ CLOCK |
| 26 | CPUCLK | OUTPUT | SYSTEM CPU CLOCK |
| 27 | CLK358M | OUTPUT | 3.58 MHZ CLOCK |
| 28 | CPUBCRT | OUTPUT | 1.9 MHZ - CPU VIDEO RAM ACCESS MUX |
| 29 | ST15B | OUTPUT | VIDEO SYNC. STROBE |
| 30 | RASB | OUTPUT | RAM ROW ADDRESS STROBE |
| 31 | DYMUX | OUTPUT | VIDEO DATA LATCH STROBE |
| 32 | VSWRB | INPUT | SYSTEM MEMORY WRITE |
| 33 | BMWRB | OUTPUT | SYSTEM RAM WRITE STROBE |
| 34 | CPULT | OUTPUT | CPU DATA LATCH |
| 35 | REQUEST | OUTPUT | REQUEST |
| 36 | CASB | OUTPUT | RAM COLUMN ADDRESS STROBE |
| 37 | RQ/GTB | BI-DIR | REQUEST GRANT |
| 38 | HLDA | OUTPUT | CPU HOLD ACK. |
| 39 | HOLD | INPUT | CPU POWER |
| 40 | VDD | POWER | POWER |

Figure 3.2 Description Of Each Pin Function

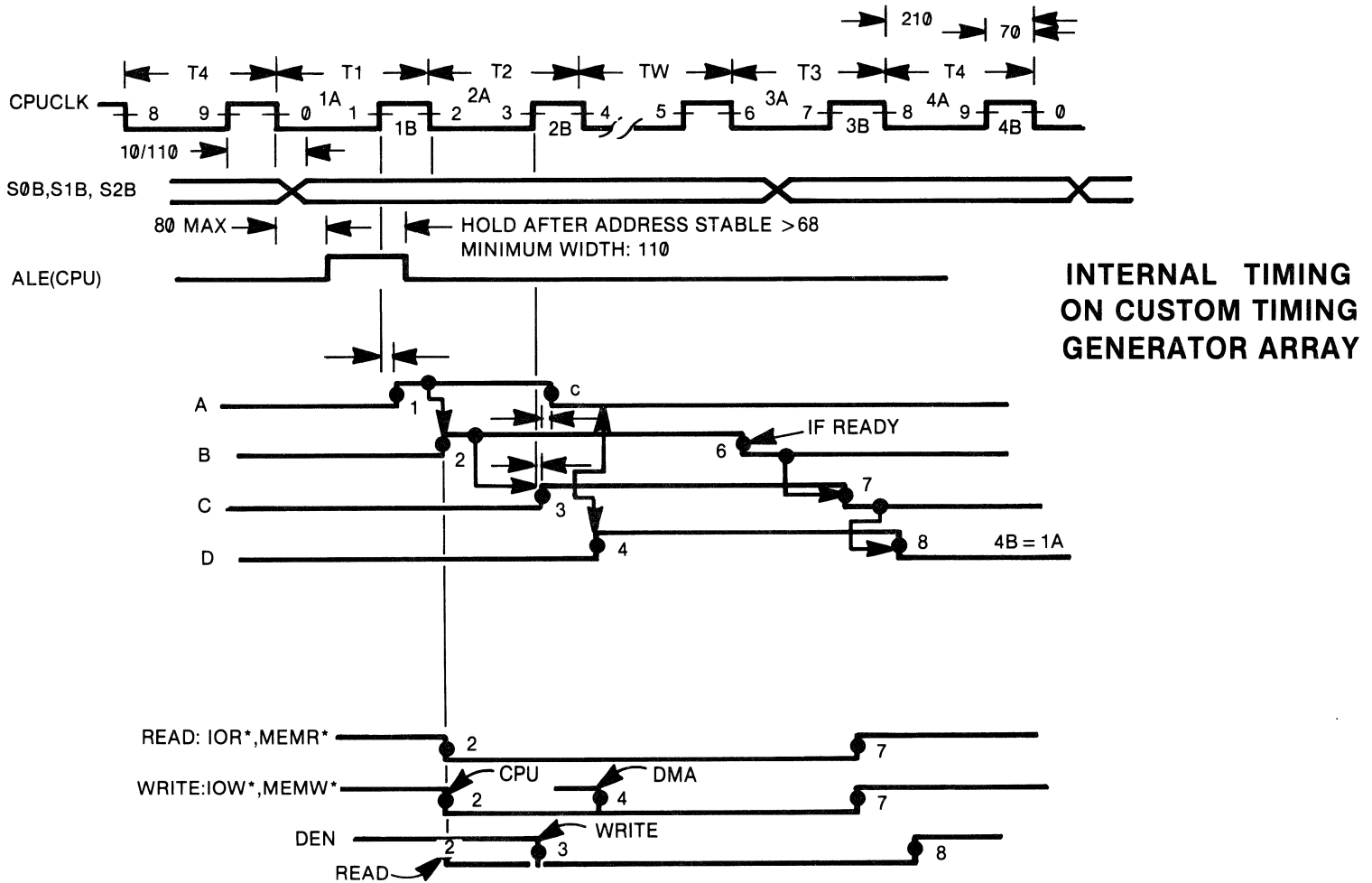
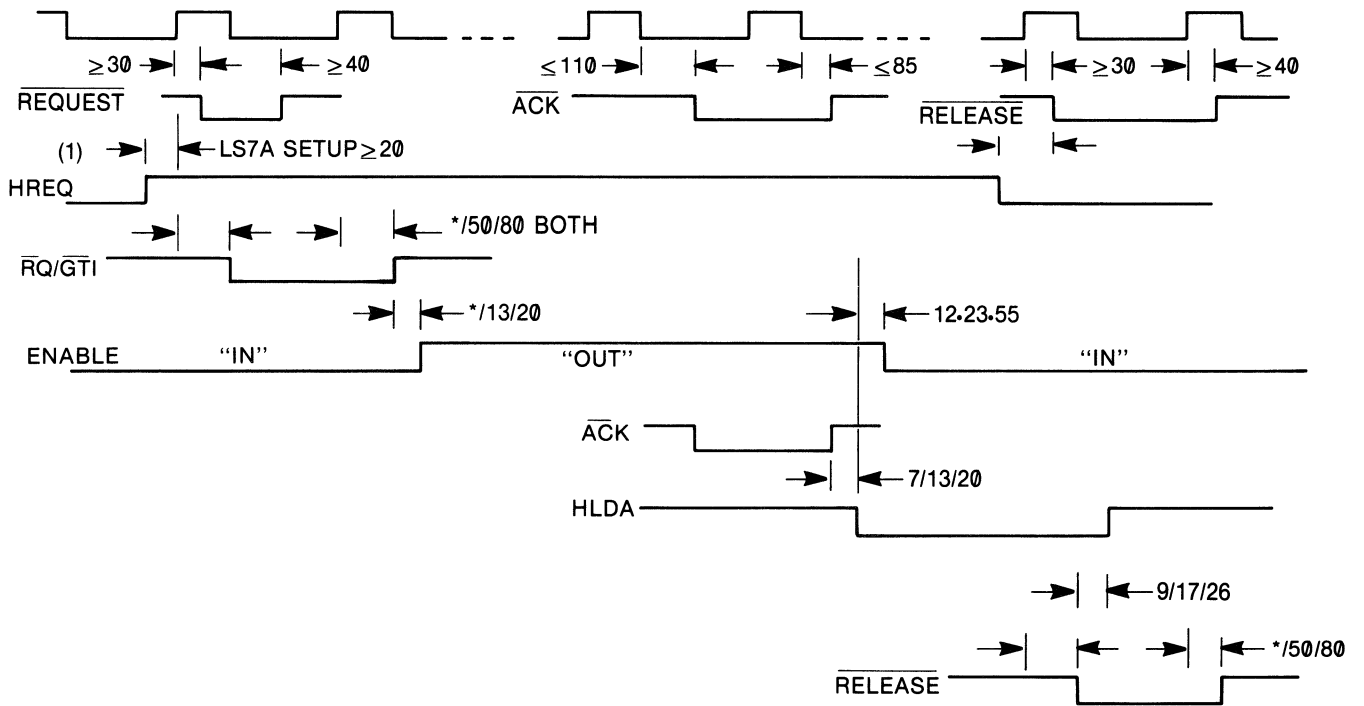


Figure 4 Timing Diagram

(All Times in Nanoseconds)



DMA 9517:
 (1) HREQ GENERATED BY CLK
 CLK = CPU CLK

Figure 5 Bus Arbitter Timing

Custom Keyboard I/F Array

The Custom Keyboard I/F Array (Part No. 8079012) replaces the 8255 and keyboard control logic from sheet 8 of schematic 8000226. This logic is functionally identical to the original design with the exception that the 8255 logic is no longer programmable. Since the original design requires the correct programming of the 8255, this change in no way affects the usefulness of the circuit.

One change associated with the Custom Keyboard Array is the addition of a software control bit to disable the internal speaker. This control bit is I/O location 0061 bit 4. A "1" at this location disables the internal speaker. A pin-out for the the Custom Keyboard Array is given in Figure 6.

| | | | |
|----|--------|---------|----|
| 1 | KBCLK | UDD | 40 |
| 2 | KBDATA | MULCLK | 39 |
| 3 | KBBUSY | MULDATA | 38 |
| 4 | KBINT | PC3 | 37 |
| 5 | KBIZ0 | TCH2G | 36 |
| 6 | KBIZ1 | PPITIM | 35 |
| 7 | IOD0 | DS0 | 34 |
| 8 | IOD1 | DS1 | 33 |
| 9 | IOD2 | FDCRST | 32 |
| 10 | IOD3 | DMA/I | 31 |
| 11 | IOD4 | MTRON | 30 |
| 12 | IOD5 | FDCTC | 29 |
| 13 | IOD6 | SNDCWL | 28 |
| 14 | IOD7 | SNDCLO | 27 |
| 15 | PIOCS | SNDCLO | 26 |
| 16 | BA00 | TMROUT2 | 25 |
| 17 | BA01 | PC4 | 24 |
| 18 | BIOR | SYSRST | 23 |
| 19 | BIOW | KBRST | 22 |
| 20 | VSS | DORCLK | 21 |

Figure 6 Custom Keyboard Array

| | | |
|---|--------------------------------|----------|
| - | DISK DRIVE, 5 1/4" | 8790127 |
| 1 | Cable Signal Floppy Disk | 8709563 |
| 1 | Cable, AC In | 8709584 |
| 1 | Harness, AC | 8709553 |
| 1 | Fan | 8790401 |
| 1 | Speaker | 8490009 |
| 1 | Cable, Speaker | 8709574 |
| 1 | Label, Caution (Option Bds.) | 87891375 |
| 2 | Faston Ground Connector | 8529018 |
| 2 | Screw 4-40 x 3/8" | 8569002 |
| 2 | Nut, Keps 4-40 | 8579003 |
| 1 | Main Logic T1000 PCB Sub Assy. | 8857139 |

```
=====
Symbol          Description                      RS Part No.
=====
```

Main Logic Sub Assembly

```

Main Logic T1000 PC Board Rev. B      8709604B

C1-4,7-9,24,
  26-38,41,
  44-48,49A,
  50-60,63-71,
  74-78,81-89,
  113-115,119  Capacitor 0.1 MFD 50V 80% Axial      8374104
C5,49,72,79,
  80,110,110A  Capacitor 22 MFD 16V +20 Axial      8316221
C6,112         Capacitor 100 MFD 16V NP AX.        8317101
C10,25,106,
  109,111      Capacitor 10 MFD 16V Elec Axial     8316101
C10A           Capacitor 100 PF 50V 10%           8301104
C11,12,55A    Capacitor 0.1 MFD Radial monolithic 8384104
C13-16,13A-16A Capacitor 68 PFD 50V 10%          8300584

C17-22,86A,
  90-92,101,
  101A,105B    Capacitor 20PF 50V +80-20          8300204
C23           Capacitor 0.01 MFD 50V 20%        8303104
C39           Capacitor 0.022 MFD 63V 10% Poly   8393225
C42           Capacitor 220 PFD 50V 10%         8301223
C43,102-105,
  102A,105A,
  112A        Capacitor 470 PFD 50V 10%         8301474
C73           Capacitor 180 PFD 50V 10%         8301184
C93-100      Capacitor 2200 PFD 50V 10%        8302224
C107         Capacitor 0.47 MFD 50V 80/20%     8384475
C108         Capacitor 330 PFD 50V C. 5%       8301332

CR1          Diode IN5235 6.8V                 8150235
CR2          Zener Diode 1N4148 75V            8150148

E1-2,3-4,8-9 Jumper Plugs                       8519098
E1-9         Staking Pins AMP 1-87             8529014
```

TANDY COMPUTER PRODUCTS

| Symbol | Description | RS Part No. |
|--|---|-------------|
| FB1 | Inductor, Ferrite Bead | 8419014 |
| FB2 | Ferrite Bead W/Lead | 8419013 |
| J1 | Connector, 2-Pin Straight Header | 8519193 |
| J2,3 | Connector, 6-Pin Rt. Angle | 8519095 |
| J4 | Connector, 8-Pin Rt. Angle | 8519203 |
| J5 | Connector, Dual 17-Pin Straight Header | 8519120 |
| J6 | Connector, 9-Pin St. Frict. Lock | 8519191 |
| J7,8,9 | Connector, Dual 31-Pin Straight Card Edge | 8519236 |
| J11 | Connector, 9-Pin Rt. Angle Male "D" Sub (Low cost, Snap in) | 8519235 |
| J12 | Connector, 9-Pin Rt. Angle Female "D" Sub | 8519245 |
| J13 | Connector, Dual RCA Phono Jack Rt. Angle | 8519213 |
| Q1 | Transistor PNP 2N3906 | 8100906 |
| Q2 | Transistor VMOS VN0104N3 | 8190104 |
| Q3 | Transistor NPN 2N3904 | 8110904 |
| R1 | Resistor Variable 1K | 8279411 |
| R2 | Resistor 6.8K Ohm 1/4 Watt 5% | 8207268 |
| R4,45 | Resistor 10 Ohm 1/4 Watt 5% | 8207010 |
| R5 | Resistor 330 Ohm 1/4 Watt 5% | 8207133 |
| R6,10,13,15, 17,23,28,30, 44,46,47, 57-59 | Resistor 10K Ohm 1/4 Watt 5% | 8207310 |
| R7,18A,32 | Resistor 560 Ohm 1/4 Watt 5% | 8207156 |
| R17A,20,29, 31,33 | Resistor 4.7K Ohm 1/4 Watt 5% | 8207247 |
| R8 | Resistor 82.5K Ohm 1/4 Watt 1% | 8200382 |
| R9,12,14,16 | Resistor 1 Meg Ohm 1/4 Watt 5% | 8207510 |
| R11 | Resistor 680K Ohm 1/4 Watt 5% | 8207468 |
| R18,19 | Resistor 910 Ohm 1/4 Watt 5% | 8207191 |
| R21,26 | Resistor 1K Ohm 1/4 Watt 5% | 8207210 |
| R22,27 | Resistor 47 Ohm 1/4 Watt 5% | 8207047 |
| R24 | Resistor 33 Ohm 1/4 Watt 5% | 8207033 |
| R35 | Resistor 750 Ohm 1/4 Watt 5% | 8207175 |
| R34,52-56 | Resistor 2.2K Ohm 1/4 Watt 5% | 8207222 |

TANDY COMPUTER PRODUCTS

| Symbol | Description | RS Part No. |
|---|---|-------------|
| R36 | Resistor 1.1K Ohm 1/4 Watt 5% | 8207211 |
| R37 | Resistor 3.3K Ohm 1/4 Watt 5% | 8207233 |
| R38, 43 | Resistor 680 Ohm 1/4 Watt 5% | 8207168 |
| R39 | Resistor 1.2K Ohm 1/4 Watt 5% | 8207212 |
| R40 | Resistor 270 Ohm 1/4 Watt 5% | 8207127 |
| R41 | Resistor 620 Ohm 1/4 Watt 5% | 8207162 |
| R42 | Resistor 100 Ohm 1/4 Watt 5% | 8207110 |
| R42A | Resistor 2.7K Ohm 1/4 Watt 5% | 8207227 |
| R48 | Resistor 75 Ohm 1/4 Watt 5% | 8207075 |
| R50, 51 | Resistor 100K Ohm 1/4 Watt 5% | 8207410 |
| | Resistor 10K Ohm (added near R33 to eliminate noise from light pen circuit) | |
| RP1 | Resistor Pak 33 Ohm 6-Pin Sip | 8290056 |
| RP2, 6 | Resistor Pak 10K Ohm 8-Pin Sip | 8292310 |
| RP3, 4, 12 | Resistor Pak 33 Ohm 8-Pin Sip | 8295033 |
| RP5, 7 | Resistor Pak 1K Ohm 8-Pin Sip | 8290212 |
| RP9 | Resistor Pak 10K Ohm 10-Pin Sip | 8290010 |
| RP10 | Resistor Pak 4.7K Ohm 8-Pin Sip | 8292246 |
| RP11 | Resistor Pak 33 Ohm 16-Pin Dip | 8290044 |
| S1 | Switch, Reset | 8489065 |
| U1-4, 10, 11, 18-21, 32-35, 4, 45, 70 | Socket 16-Pin Dip | 8509003 |
| U1-4, 10, 11, 18-21, 32-35, 44, 45 | IC 64K x 1 Dram 150 NS | 8043665 |
| U5, 22 | IC 74LS374N Flip Flop | 8020374 |
| U6, 23, 54*, 55* | IC, 74LS373N Octal Latch | 8020373 |
| U7 | LM386N-1 Audio Amp | 8050386 |
| U8 | Socket 24-Pin Dip | 8509001 |
| U8 | IC 8253-5 Timer | 8040253 |
| U9, 25, 28, 29, 43, 50, 66 | Socket 40-Pin Dip | 8509002 |
| U9 | IC Custom Keyboard I/F Array | 8079012 |
| U12 | IC 74LS138 Decoder | 8020138 |
| U13, 24, 30, 47 49 | IC 74LS04 Hex Inverter | 8020004 |
| U14, 39, 62, 63 | IC74LS32 Quad 2-IN OR Gate | 8020032 |

TANDY COMPUTER PRODUCTS

| Symbol | Description | RS Part No. |
|---------------------------|----------------------------------|-------------|
| U15 | LM339 Quad Comparato | 8050339 |
| U16,48,67 | IC 74LS08N Quad 2-IN AND | 8020008 |
| U17,51 | Socket 28-Pin Dip | 8509007 |
| U17 | IC 8259A Interrupt Controller | 8040259 |
| U25 | IC Custom Timing Generator Array | 8079011 |
| U26,36,37,40, 41,56,69 | IC 74LS244 Octal Buffer | 8020244 |
| U27 | IC 74LS02 2-IN Nor | 8020002 |
| U28 | IC 8088 CPU | 8048088 |
| U31 | IC 74LS112 J K Flip Flop | 8020112 |
| U38 | IC 74LS05 Hex Inverter | 8020005 |
| U40,52,53,73 | Socket 20-Pin Dip | 8509009 |
| U42 | IC 74LS161N Counter | 8020161 |
| U43 | IC 8272 FDC | 8040272 |
| U46 | IC74LS174 Flip-Flop | 8020174 |
| U50 | IC Custom Video Array | 8079001 |
| U51 | IC 128K ROM | 8040328 |
| U52,53,73 | IC 74LS245 Tranceiver | 8020245 |
| U53 (Pin 19 to +5V) | 4.7 Ohm 1/4W 5% CF | 8207247 |
| U57 | Socket 8-Pin Dip | 8509011 |
| U57 | IC FDC9216 Data Separator | 8040216 |
| U58 | IC 7417 Hex Buffer | 8000017 |
| U59 | IC 74LS14 Hex Inverter | 8020014 |
| U60 | IC 7416 Hex Inverter Buffer | 8000016 |
| U61 | IC 74LS195A Shift Register | 8020195 |
| U64 | Socket 68-Pin, PLCC | 8509020 |
| U64 | IC Custom Address Array | 8079013 |
| U65 | IC 7407 Hex Inverter | 8000007 |
| U66 | IC Custom Gate Array, Printer | 8041087 |
| U68 | IC 74LS86N Quad 2-IN OR | 8020086 |
| U70 | IC SN76496 Tone Generator | 8040496 |
| U71 | IC 14529 | 8030529 |
| U72 | LM358 | 8050358 |

* HCT is not an approved substitute for these LS parts.

| | | |
|-----|-------------------------|---------|
| VR1 | Regulator 78L05 ACP +5V | 8052805 |
| VR2 | Regulator 79M05CT | 8190005 |
| VR2 | Screw 4-40 x 1/4 | 8569031 |
| VR2 | Nut Keps 4-40 | 8579003 |

| Symbol | Description | RS Part No. |
|--------|--|-------------|
| Y1 | Crystal 8 MHZ (18PF Loading Capacity) | 8409006 |
| Y2 | Oscillator 28.63636 MHZ 50 PPM | 8409039 |

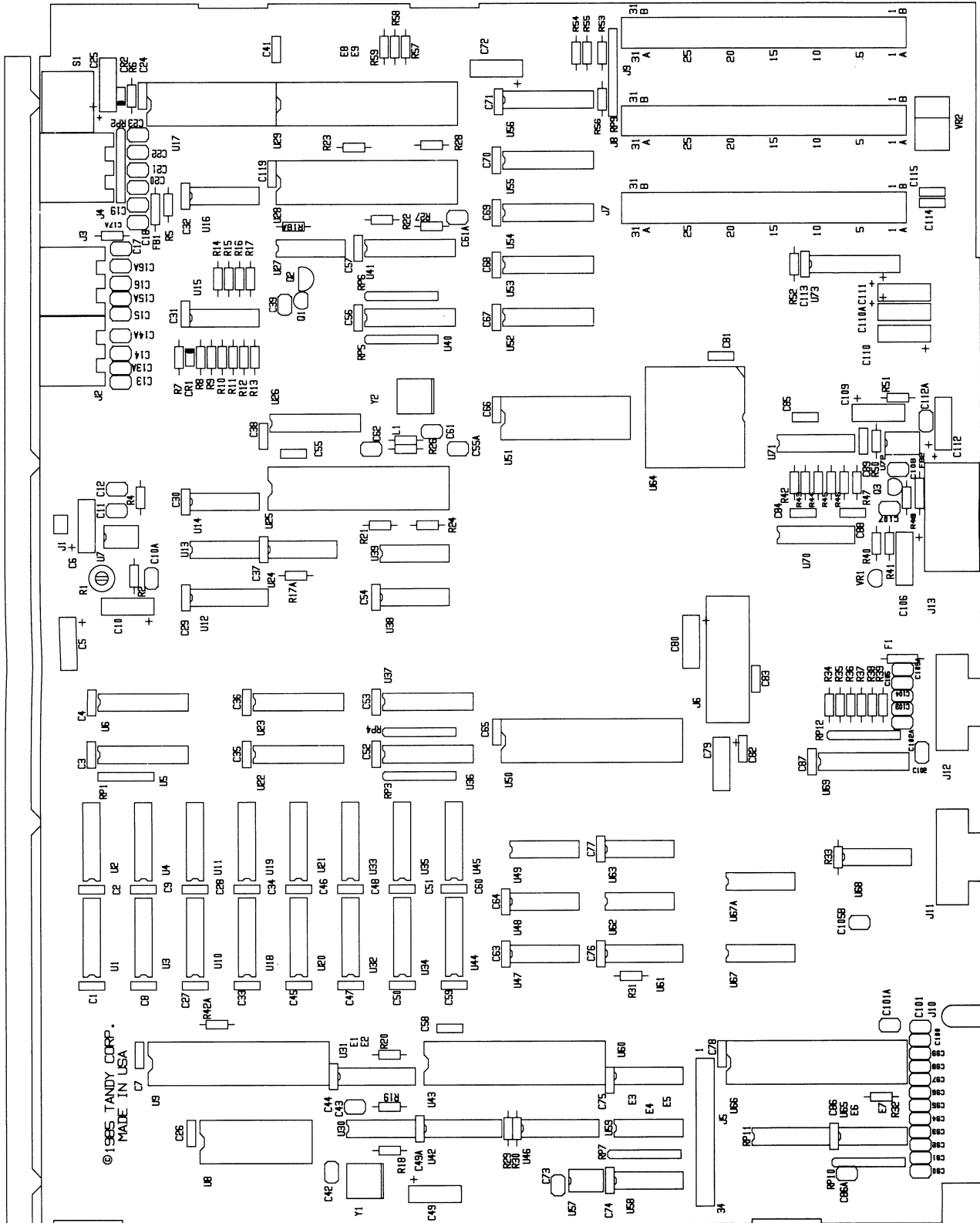
Optional Parts

| Symbol | Description | RS Part No. |
|--------|-------------|-------------|
| U29 | IC 8087 | 25-1012 |

Parts Added Or Deleted For International Version

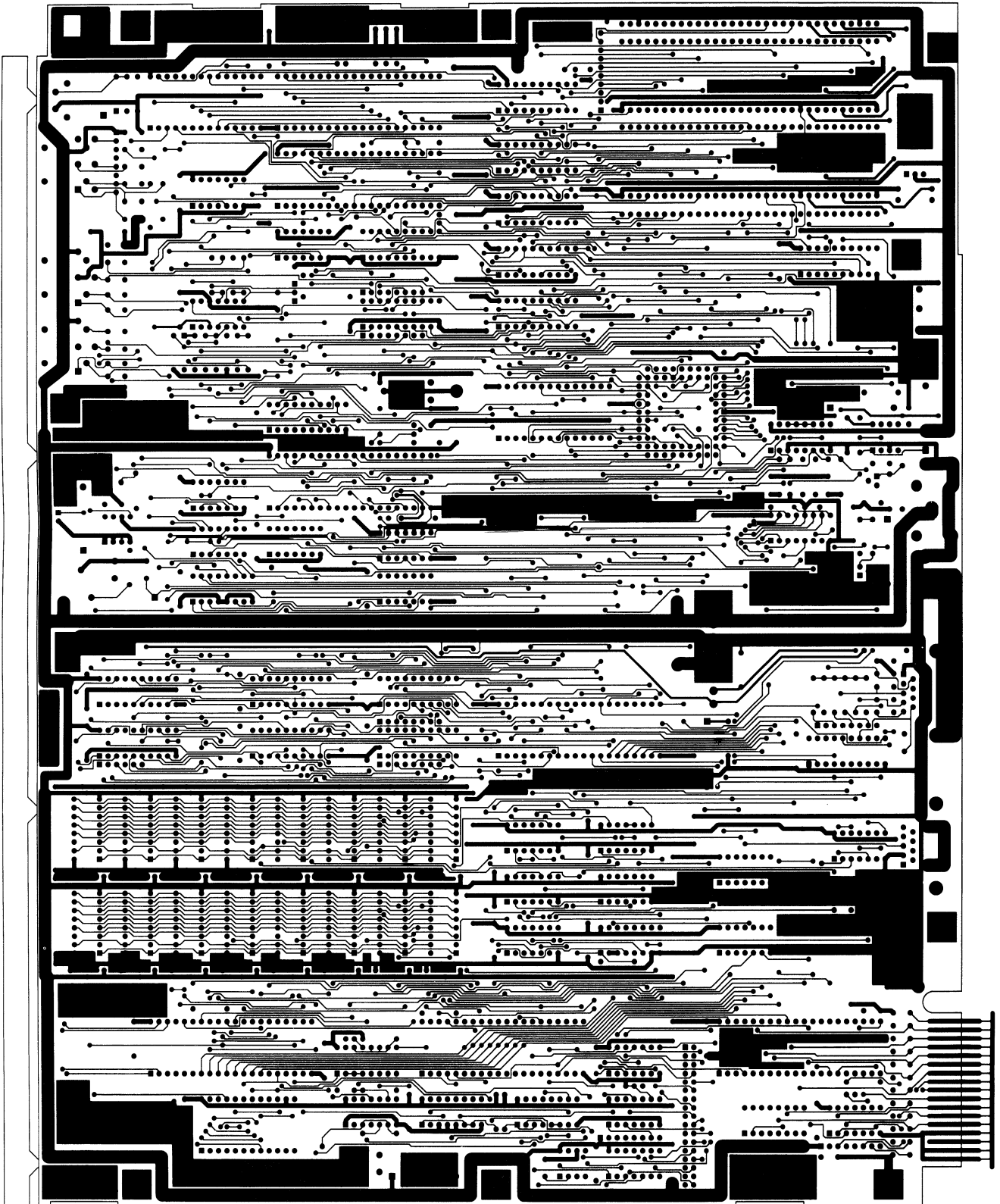
| Symbol | Description | RS Part No. |
|--------|----------------------------------|-------------|
| F1 | Fuse, 0.25A Pico (ADD) | 8479034 |
| Y2 | Crystal Oscillator 28.500014 MHZ | 8409044 |

4/ Component Layout

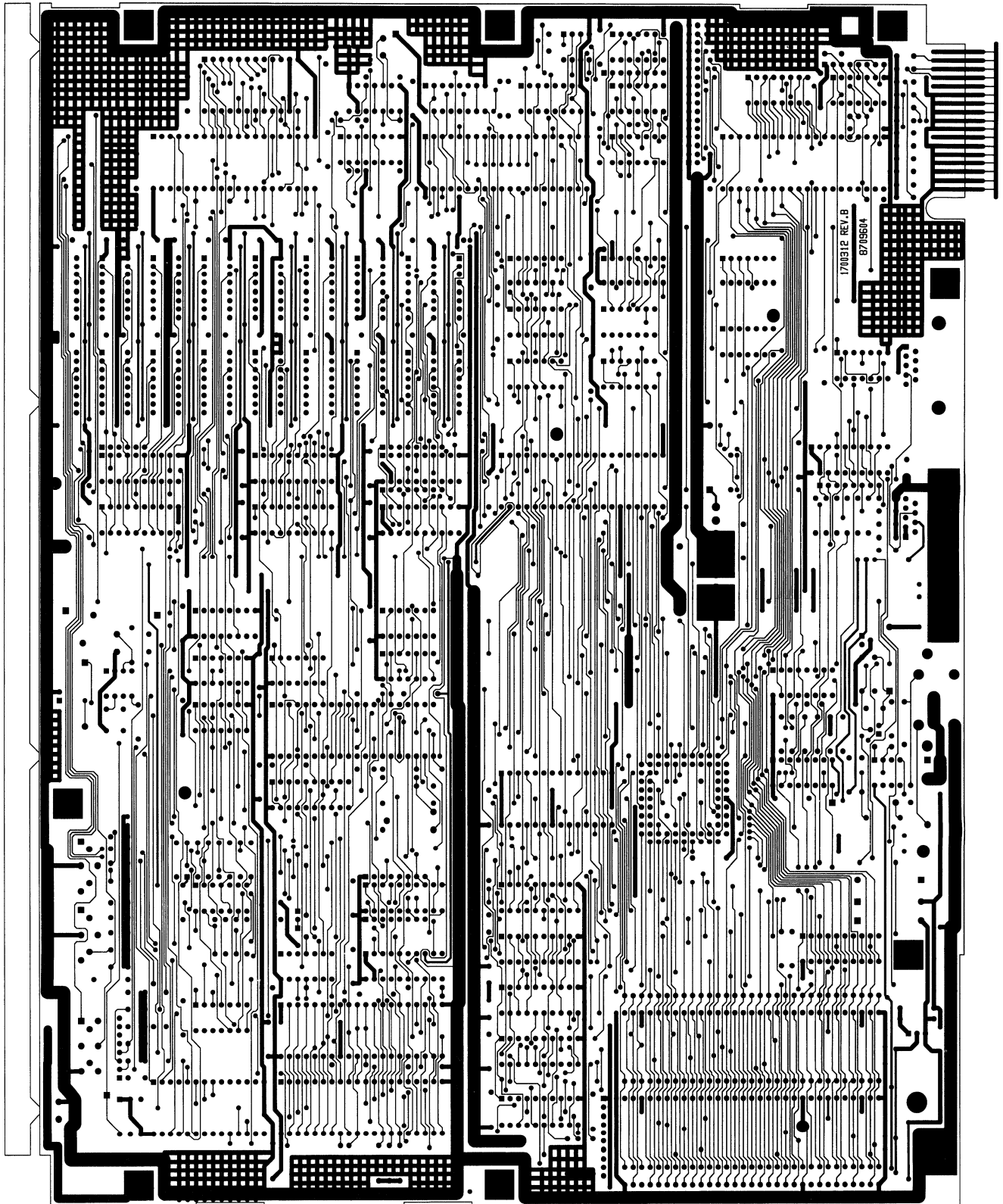


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MADE IN USA

Silkscreen

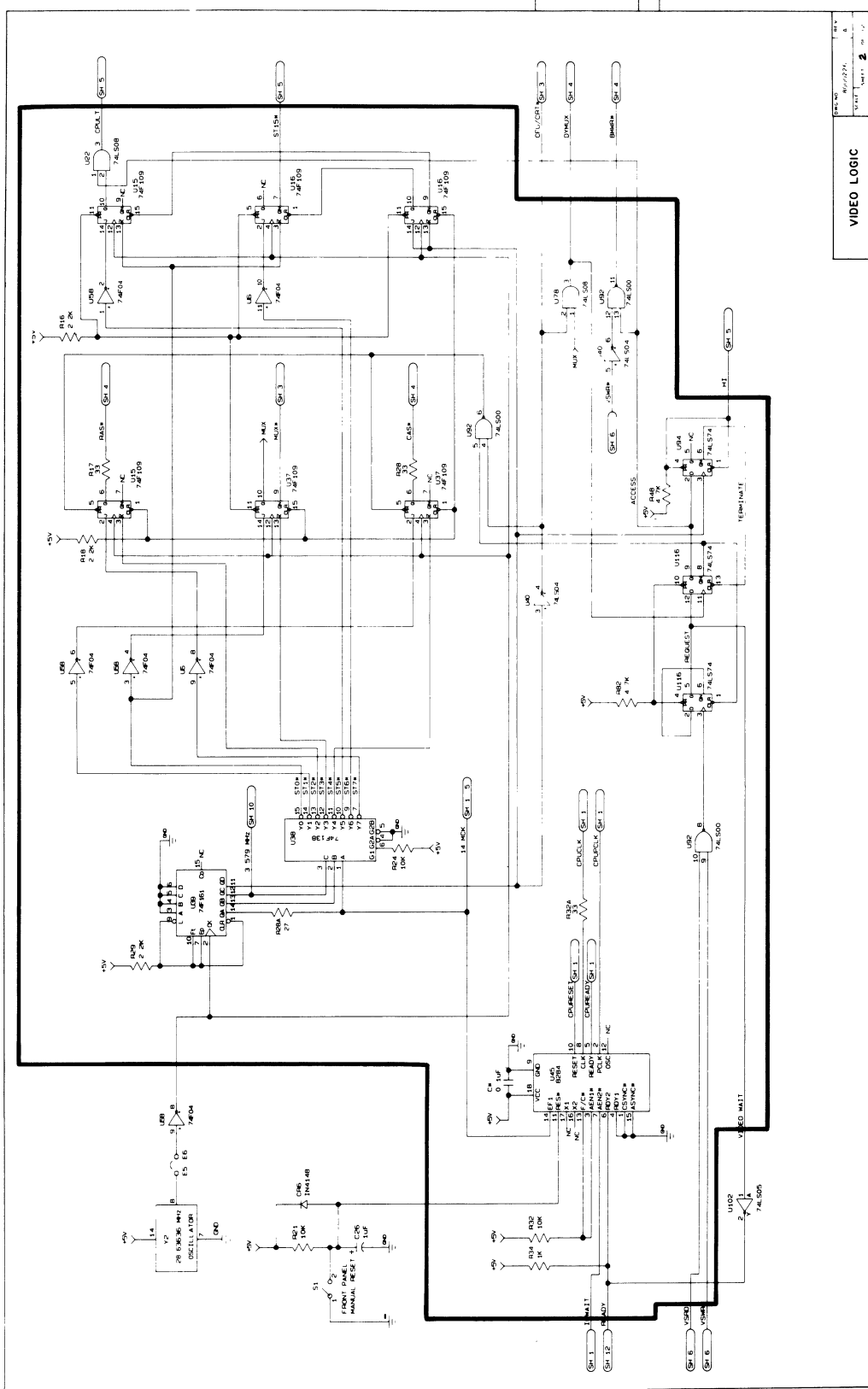


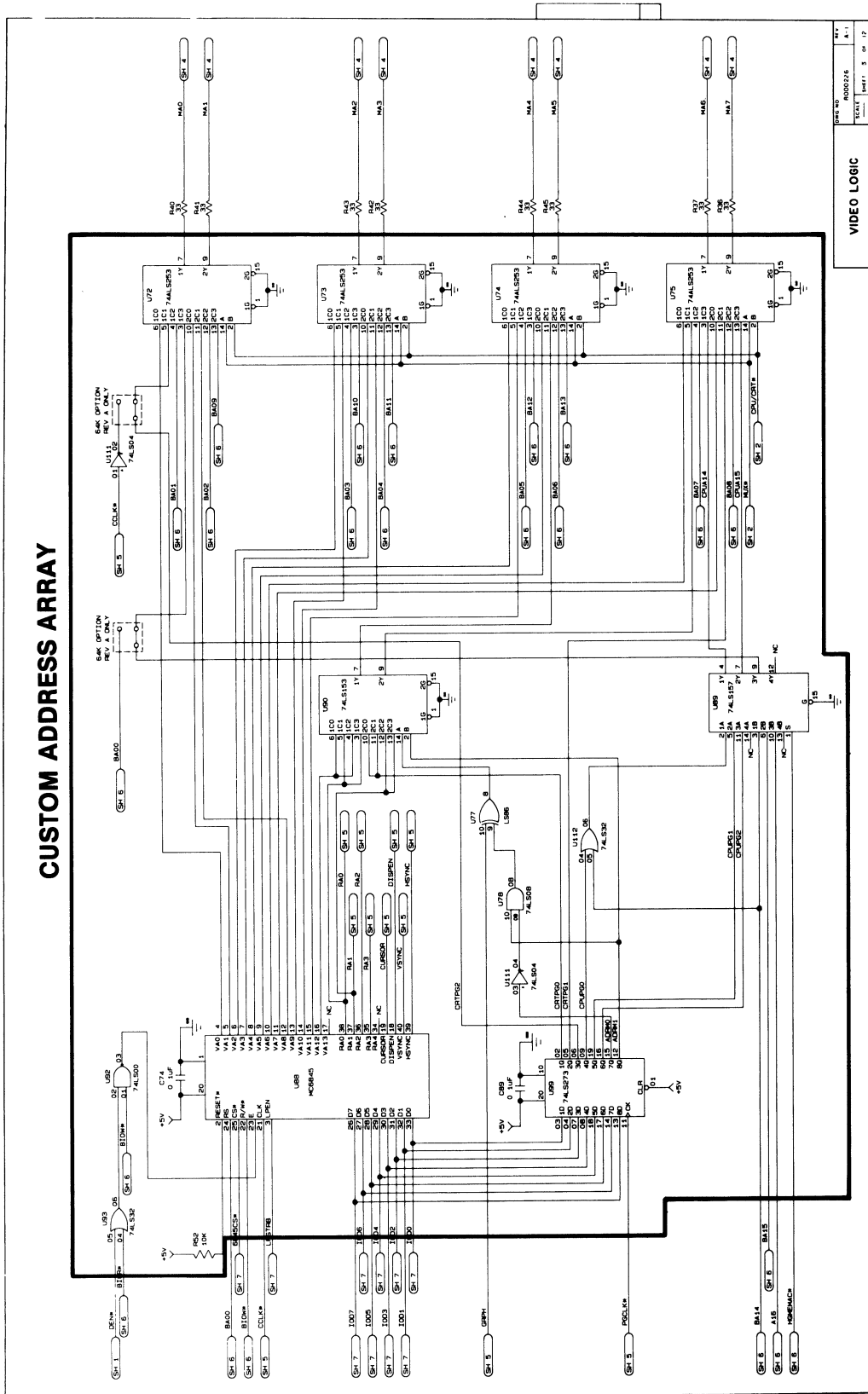
Component Side



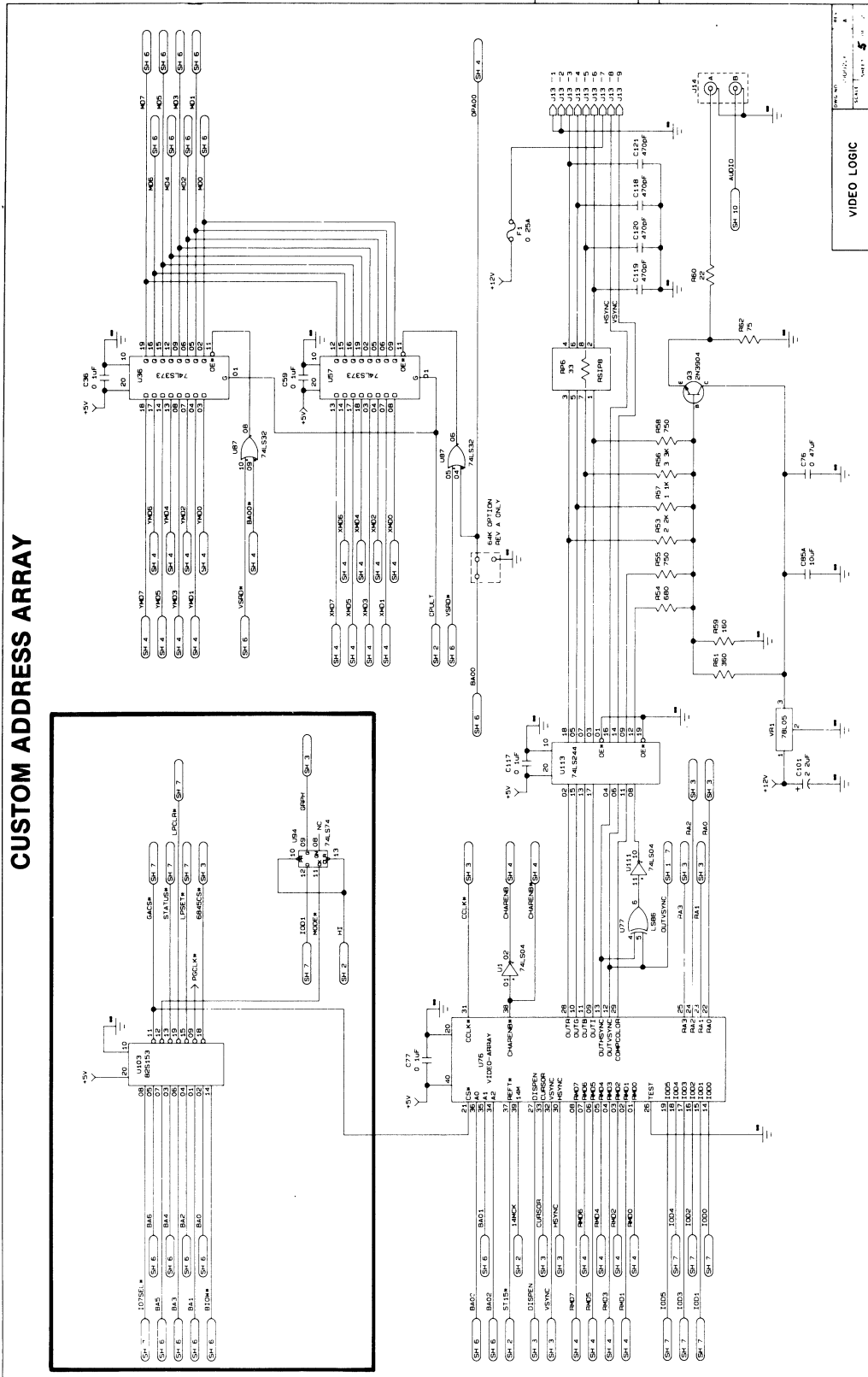
Solder Side

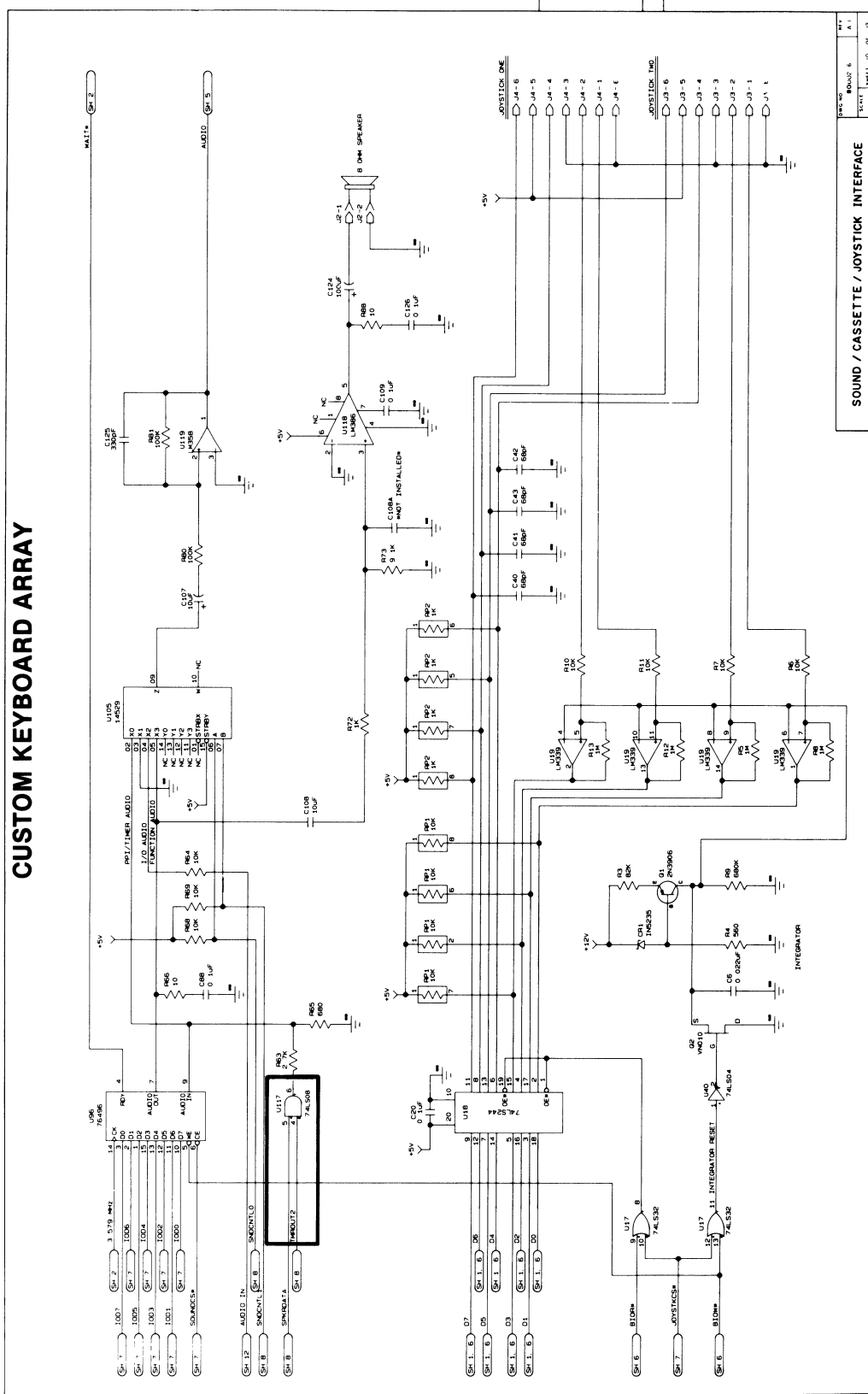
CUSTOM TIMING GENERATOR ARRAY



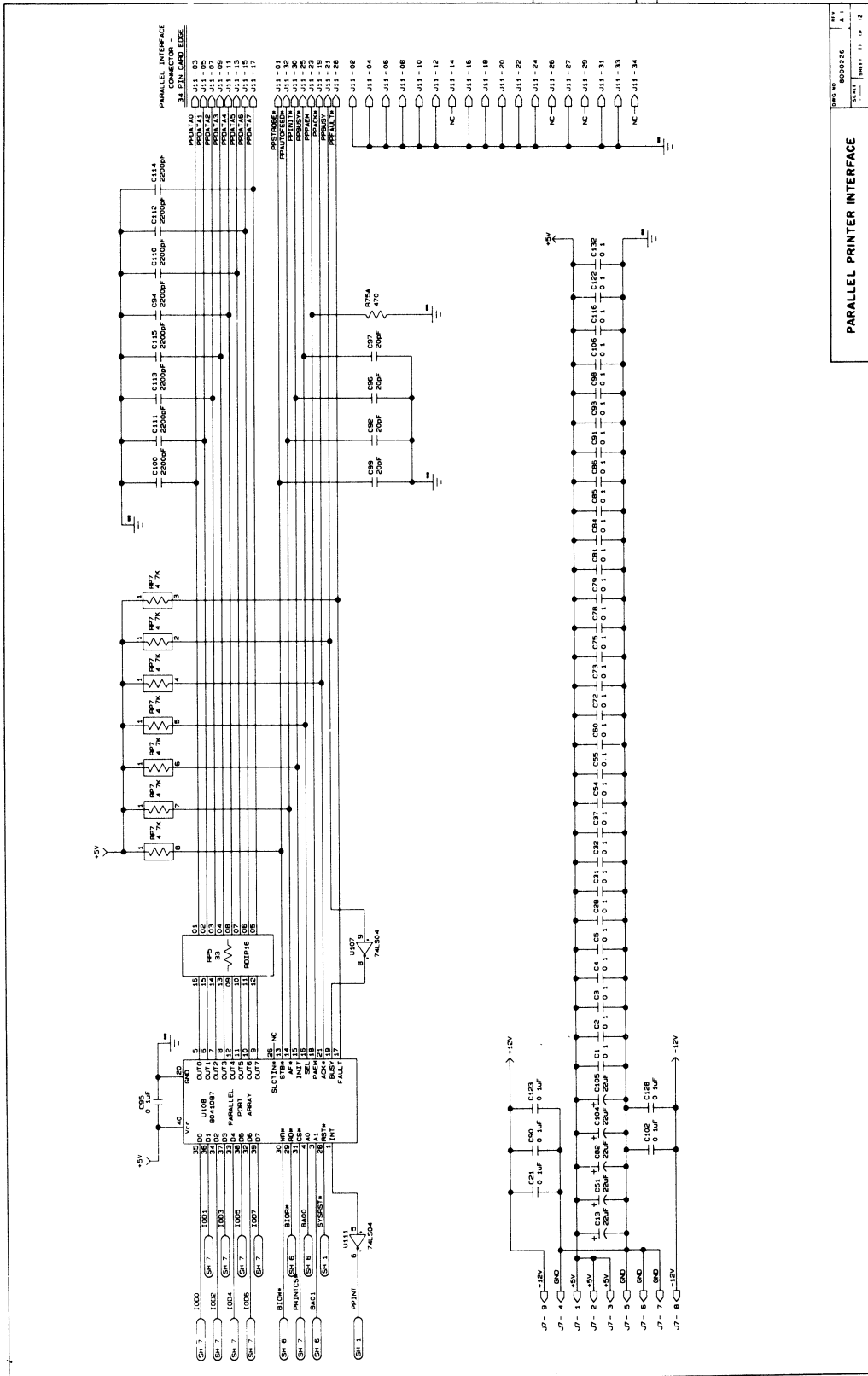


CUSTOM ADDRESS ARRAY

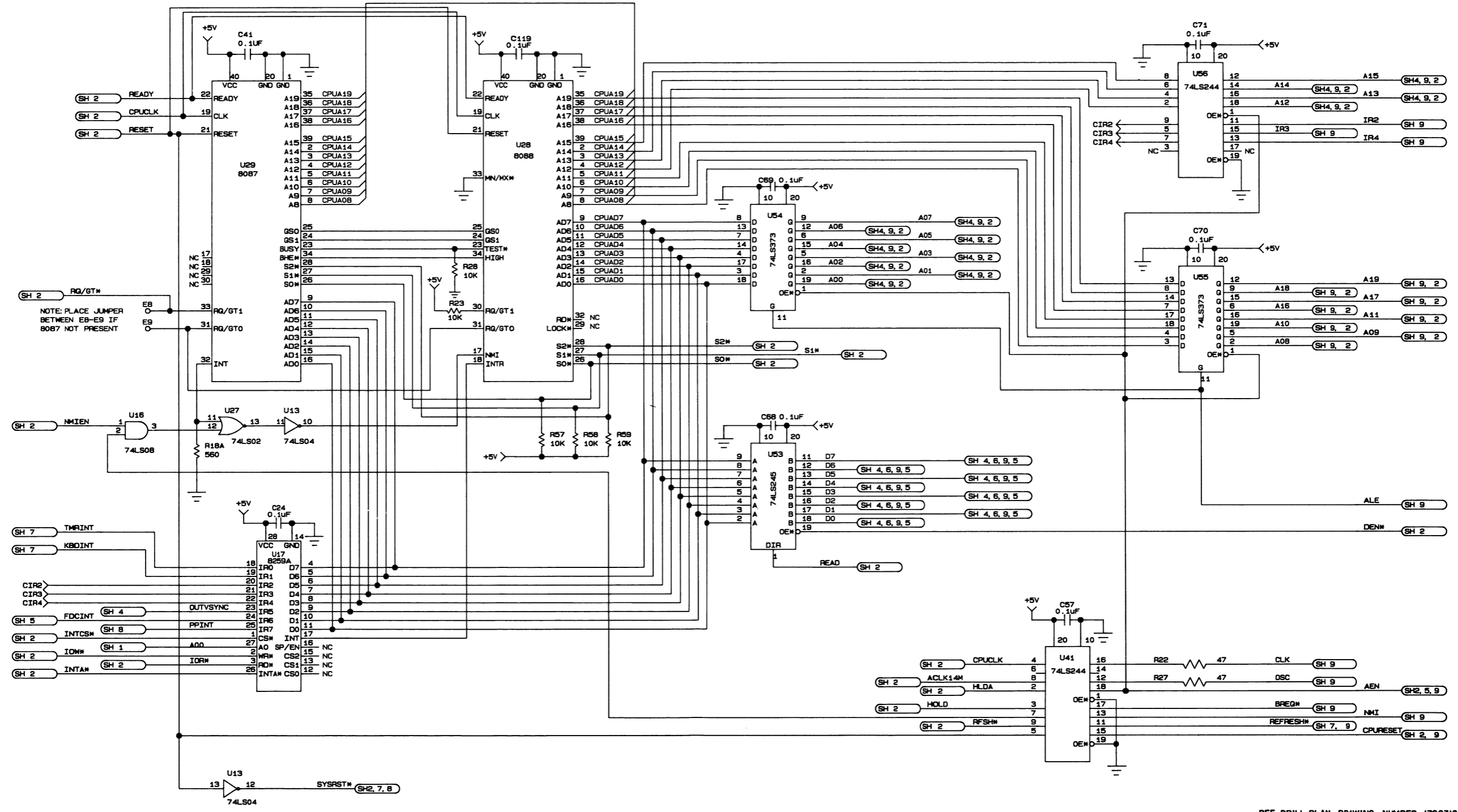




SOUND / CASSETTE / JOYSTICK INTERFACE



PARALLEL PRINTER INTERFACE



NOTE: PLACE JUMPER BETWEEN E8-E9 IF 80B7 NOT PRESENT

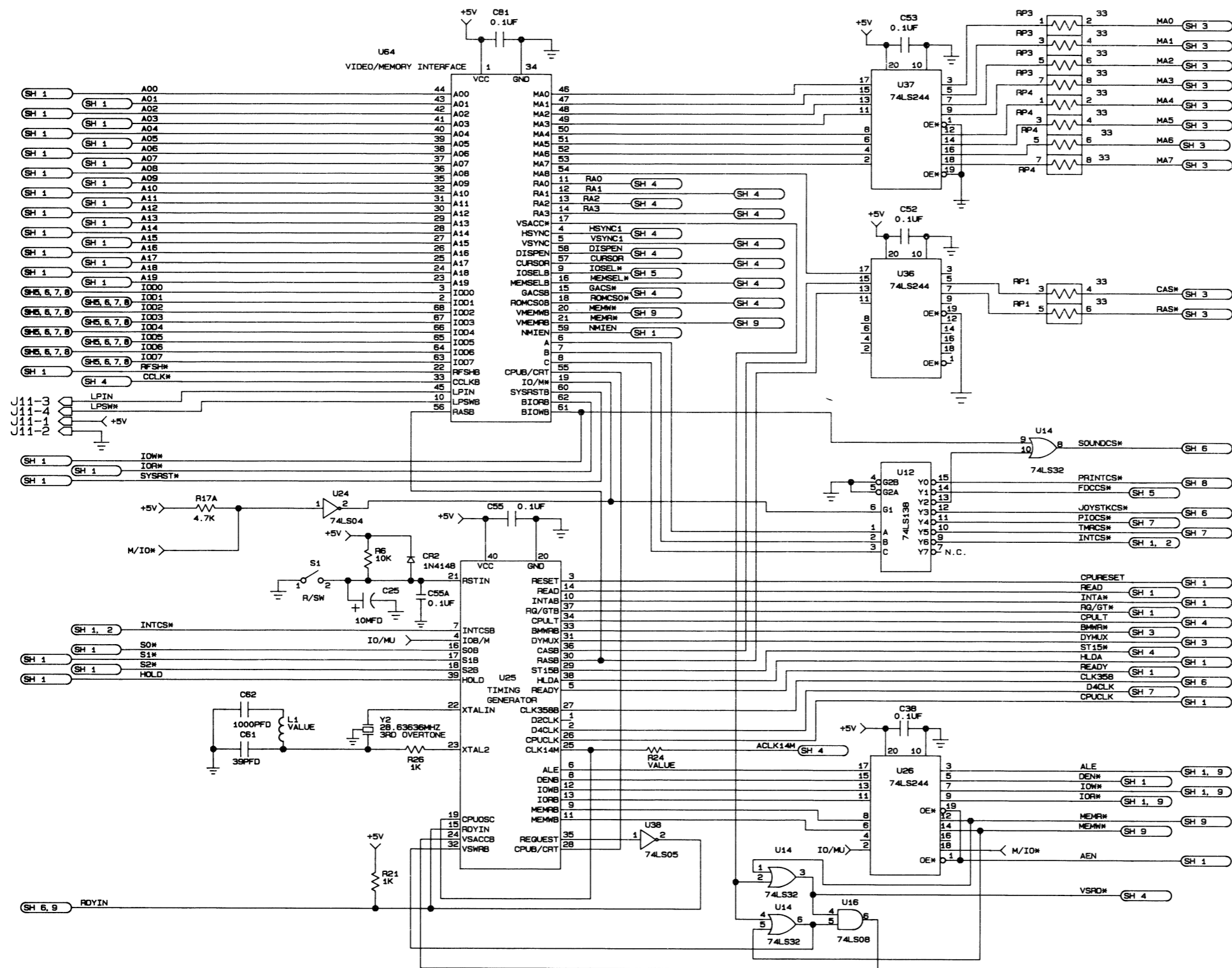
NOTE: THIS DWG IS CAD GENERATED - DO NOT REVISE MANUALLY

REF. DRILL PLAN DRAWING NUMBER-1700312

| | | |
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| DRAFT | DATE | TITLE |
| CHECK | DATE | SCHEMATIC-MAIN LOGIC |
| DESIGN | DATE | TANDY-1000 |
| APPD | DATE | COST REDUCTION PROJECT 640 |
| APPR | DATE | |
| | DATE | |

DWG NO: 8000249
 SCALE: SHEET 1 OF 9
tandy

Updated Schematics



SH 2 MA0-MA7
 SH 2 RAS*
 SH 2 CAS*

SH 4 MD0-MD7

SH 2 BMWR*
 SH 1 A00

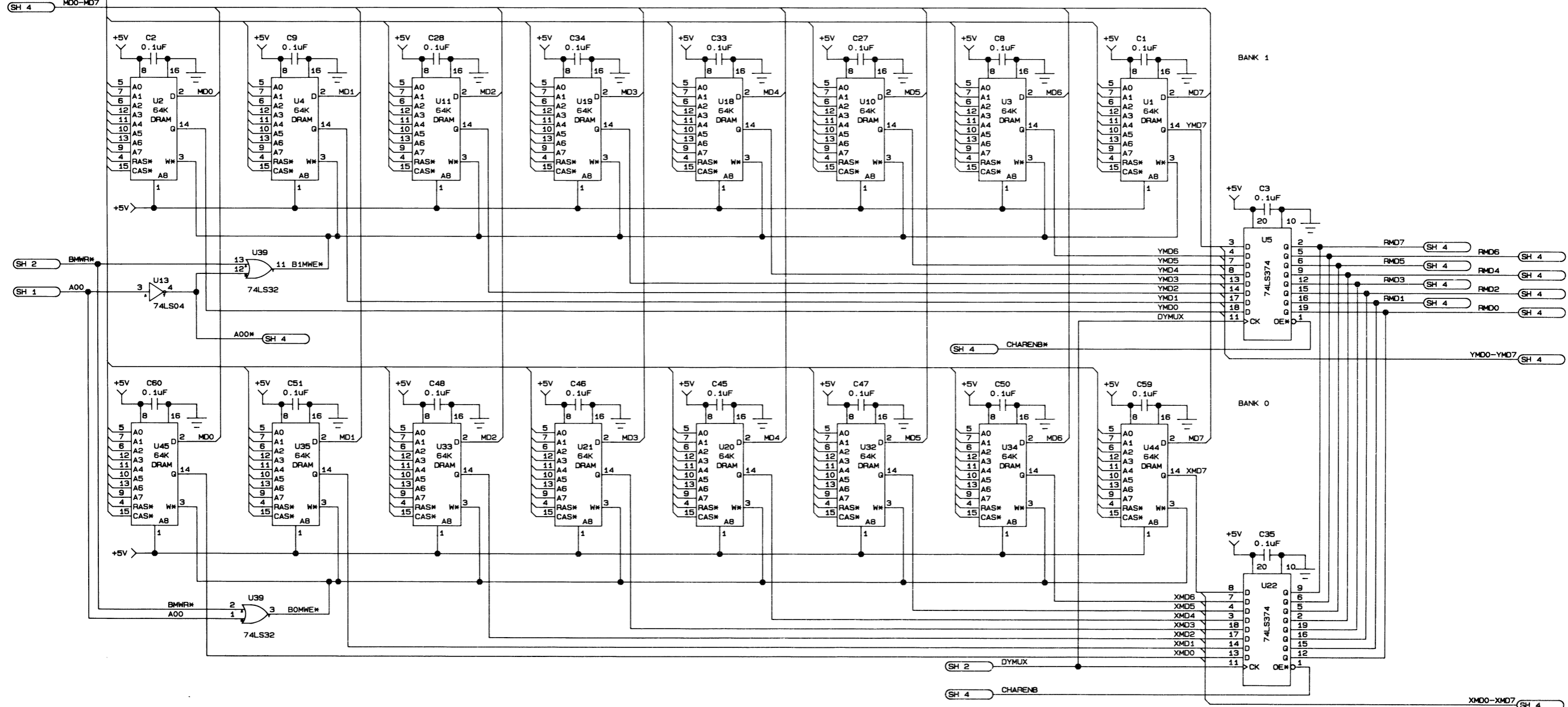
A00* SH 4

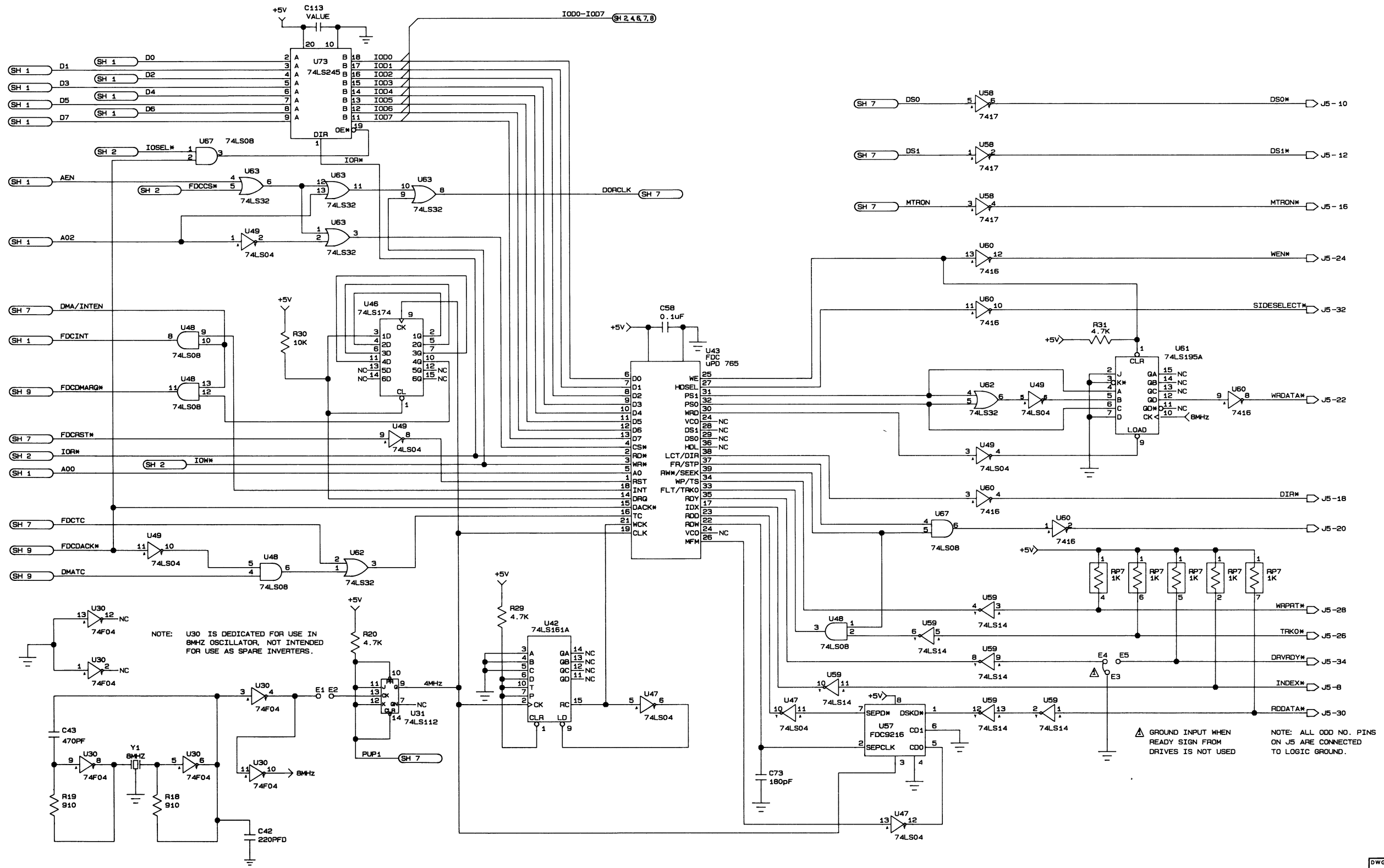
SH 4 CHAREN*

SH 2 DYMUX

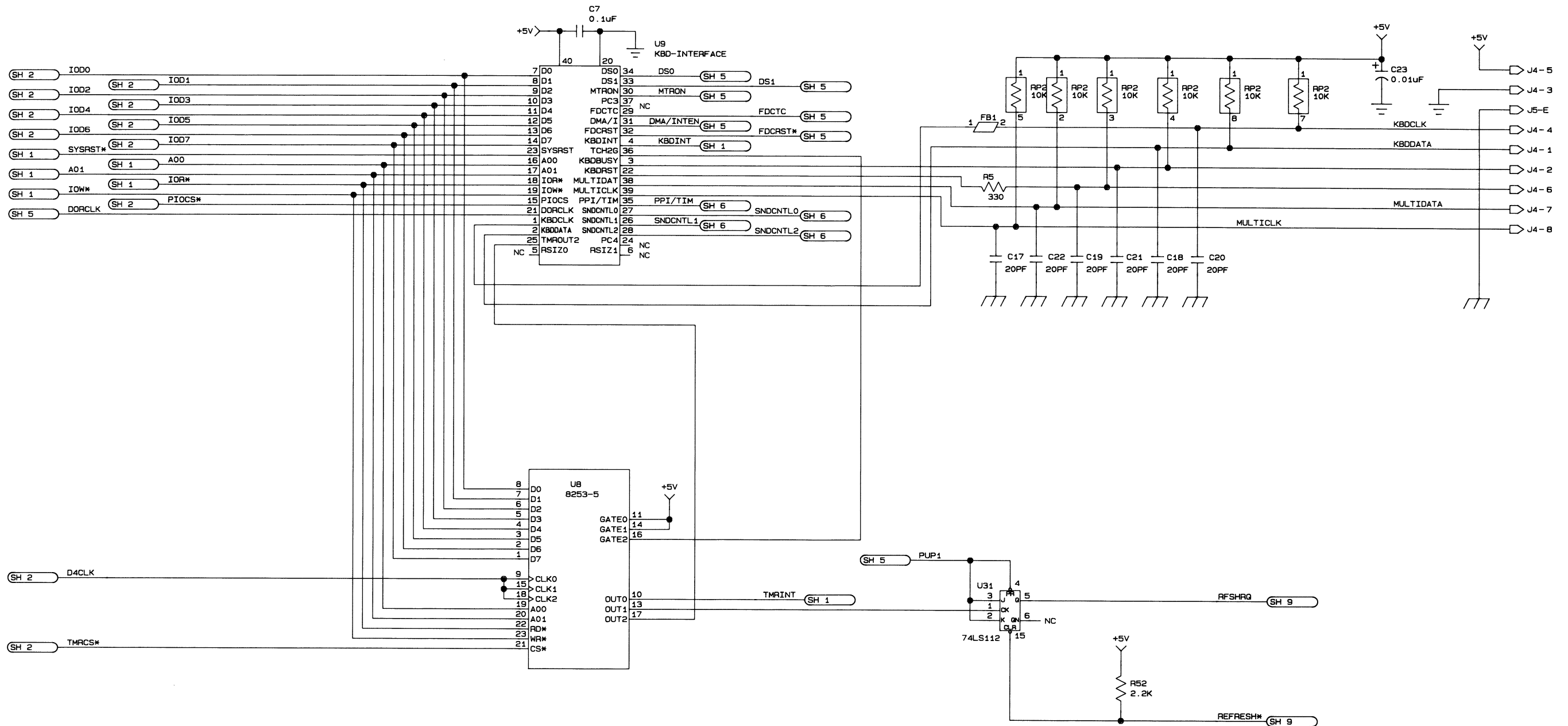
SH 4 CHAREN*

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| DWG NO | 8000249 | REV | |
| SCALE | | SHEET | 3 OF 9 |



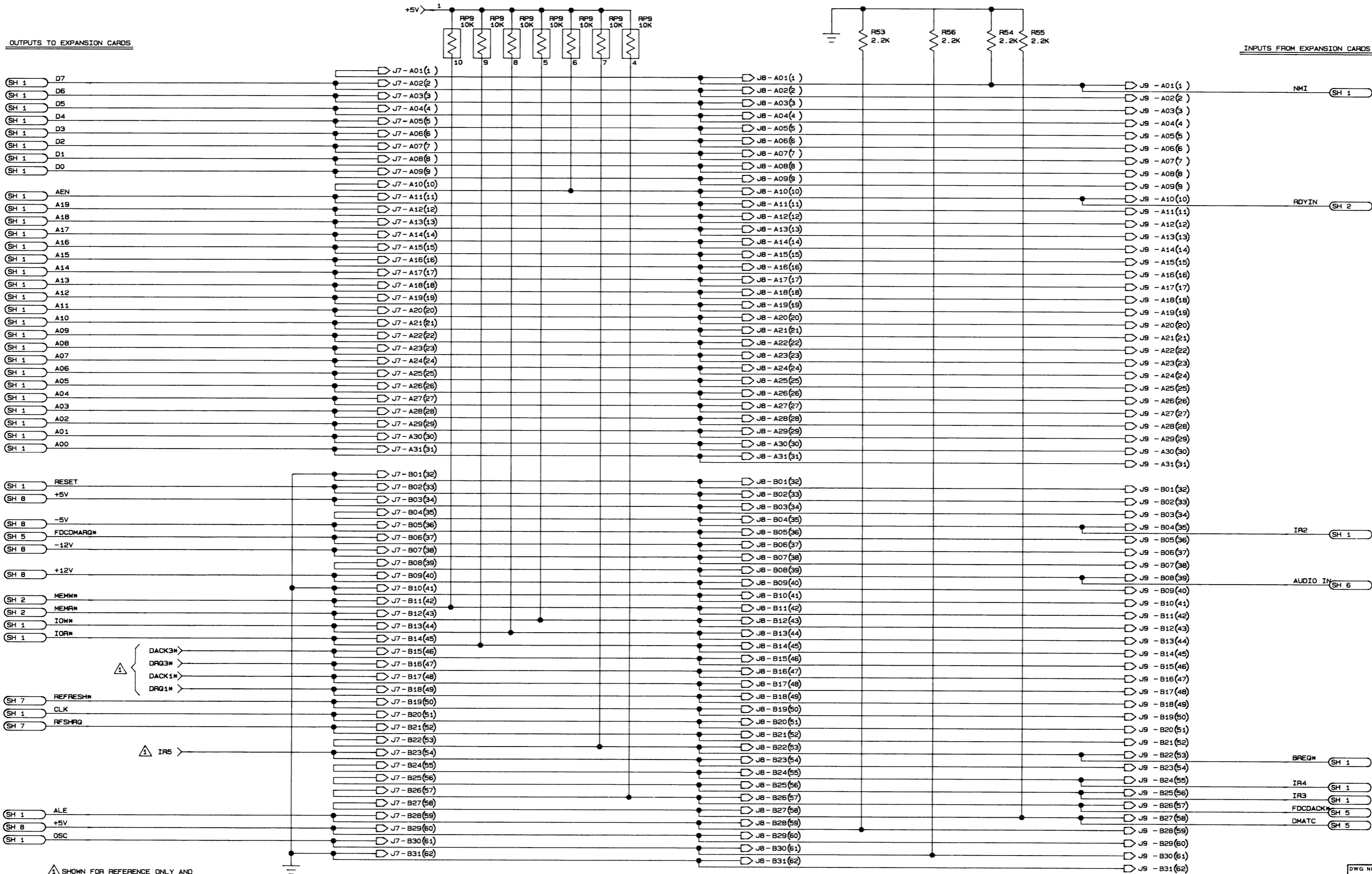


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|---------|--------------|
| DWG NO | REV |
| 8000249 | |
| SCALE | SHEET 5 OF 9 |



| | | | |
|--------|---------|---------|------|
| DWG NO | 8000249 | REV | |
| SCALE | | SHEET 7 | OF 9 |

OUTPUTS TO EXPANSION CARDS



INPUTS FROM EXPANSION CARDS

△ SHOWN FOR REFERENCE ONLY AND ARE NOT CONNECTED INTERNALLY.

| | |
|---------|--------------|
| DWG NO | REV |
| 8000249 | |
| SCALE | SHEET 9 OF 9 |

RADIO SHACK, A Division of Tandy Corporation

U.S.A.: FORT WORTH, TEXAS 76102

CANADA: BARRIE, ONTARIO L4M 4W5

| AUSTRALIA | BELGIUM | FRANCE | U. K. |
|--|--|--------------------------------------|---|
| 91 Kurrajong Avenue Mount Druitt, N.S.W. 2770 | Rue des Pieds d'Alouette, 39 5140 Naninne (Namur) | BP 147-95022 Cergy Pontoise Cedex | Bilston Road Wednesbury West Midlands WS10 7JN |