ASSEMBLY INSTRUCTIONS - SCELBI-8B P.C. CARD SET

INTRODUCTION

The following instructions apply to the assembly of all cards in the SCELBI-8B mini-computer kit. These instructions shoud be read before proceeding to the individual parts installation instructions which follow this section.

NOTES ON SOLDERING

Use a good grade rosin-core solder of a type intended for use with electronic circuits. A small 30 - 50 watt soldering iron vith a narrow tip should be used. Do not apply heat any longer than necessary to allow the solder to thoroughly flow around the component lead and into the hole surrounding the lead. The cards supplied with the SCELBI-8B have plated-through holes which means that the circuit foil extends down through each hole where an electrical connection is made to ensure that all contacts are solid. For such plated-through holes, the proper amount of solder has been applied when the solder has just started to climb up the component lead on the other side of the board from which solder is applied. Normally soldering should be done from the side opposite to that on which the components mount. After each connection has been soldered check to ensure that there are not any solder shorts to adjacent circuitry.

NOTES ON INSTALLATION OF INTEGRATED CIRCUITS

When installing integrated circuits make sure that each I.C. is properly positioned. Pin #1 on an I.C. normally has a small dot (or depression) next to it on the body of the chip. The location of this dot when the I.C. is installed should be the same as that shown on the assembly drawing. If a marker cannot be found on an I.C., then make sure that the end of the integrated circuit with a depression or colored-in area is positioned the same as indicated on the assembly drawing. All integrated circttits on the SCELBI-8B printed circuit cards mount on the cards so that they are oriented in the same direction. When installing an I.C. make sure that all of the pins on the package go through the proper holes in the P.C. board (it may be occassionally necessary to straighten a pin on an I.C.) and that the body of the I.C. is flush to the board surface once the integrated circuit has been installed several of the pins protruding through the board should be bent against the foil on the back side of the card so that the component will be held in position prior to the time it is soldered. When it is time to solder the components turn the card over so that the components are facing down and carefully solder each I.C. pin to its foil pad.

LOCATING POSITIONS OF DISCRETE COMPONENTS ON THE P.C. CARDS

SCELBI printed circuit cards have numerous holes in the board material that are lined with a conductive material and that are simply used to connect circuit foil paths from one side of the card to the other side. These holes are often termed “feed-through” holes. In addition to the “feed-through” holes there are also holes provided for the leads of discrete components to pass through and thus allow attachment of such components to the card and associated circuitry. (These holes also sometimes simultaneously serve as “feed-through” holes.) The distinc-

tion between holes that simply serve as “feed-through” holes and those that are for component leads can be made by observing the size of the foil pad that surrounds a hole. Holes for the leads of discrete components always have larger foil pads around them than the plain “feed-through” holes. This is important to remember when installing discrete components as sometimes a plain “feed-through” hole may be close to a hole that the lead of a discrete component is supposed to go through. An additional aid to discerning the proper holes for 1/4 watt resistor leads and similar components such as most diodes is to remember that the holes for such components are spaced 1/2 inch apart.

NOTES ON INSTALLATION OF RESISTORS

To prepare resistors fop mounting on the P.C. card, use a pair of needle point pliers to bend each lead perpindicular to the body of the resistor at a point 1/8 of an inch away fpom where the lead joins the resistor body. The bending of the two leads shoud be in the same direction so that the prepared resistor has the shape of a “u” with the body of the resistor forming the base of the “u” and the tips of the “u” (formed by the leads) being 1/2 an inch apart. When this has been done the resistor’s leads will be spaced to insert readily in the holes on the P.C. card. When installing a resistor, the two leads are inserted in the appropriate holes and the leads pulled from the back of the board until the resistor body is pulled up next to the P.C. card. The leads are then bent over on the back side of the card and the excess lead material cut off leaving about 1/16 of an inch of the lead against the foil pad. After the excess lead has been trimmed away, the remaining 1/16 inch of lead is soldered to the P.C. foil.

It is also important to ensure that the proper resistor value is installed at each location. Resistor values are “color-coded” by three or more color bands on the body of the resistor. The sequence of the colors (starting from the band nearest one end of the resistor and reading towards the middle of the resistor) are given for each value of a resistor used on a card. (Only the first three color bands are used to denote the actttal resistor value - any extra bands on a resistor may be ignored by the assembler as they are used to designate parameters other than the actual resistor value.)

NOTES ON INSTALLATION OF DIODES

Diodes are prepared for mounting on the P.C. card in a fashion similar to that used for resistors. The base of the “u” is the body of the diode and the distance between the tips of the “u” made by the bent leads should be 1/2 inch. Diodes have a colored band or a series of bands at one end of their body. This band marks the cathode (negative) end of the diode. The cathode end of a diode is denoted by a band or bar on the end of the diode symbol (consisting of a triangle pointing towards a bar) that will be found at locations on a P.C. card where a diode or diodes are to be installed. When installing diodes it is essential that the components are installed with their cathodes at the position indicated by the assembly drawing. Diodes are polality sensitive devices and circuits utilizing them will not operate properly if they are installed incorrectly. Diodes are mounted flush to the surface of the P.C. board the same as resistors. The excess lead length isthen trimmed off leaving 1/16 inch to be soldered to the P.C. foil pad.

GENERAL ASSEMBLY NOTES

As you perform each step in the assembly procedures make a check in the box provided to the right of each instruction as a means of remembering where you are in the assembly process.

Refer to the component location drawing provided for each card as you install the components. The drawings are essentially on a one-to-one scale with the actual printed circuit card to facilitate locating the placement of each component.

Work slowly and carefully. Make sure the specified component is inserted at the proper location and that it is oriented in the correct direction. This is especially important with integrated circuits, diodes, electrolytic capacitors, and other polarity sensitive devices. Components incorrectly installed may be catastrophically damaged when power is applied. It is better to take a few extra minutes during the assembly process to insure you are proceeding corpectly than to hurry and have to try and find an error at a later time - possibly after ipreversible damage has occured to a component. A careful assembler will be able to complete each card in the SCELBI-8B kit in about two hours.

Step-by-step instructions for each card begin on the next page!

SCELBI COMPUTER CONSULTING, INC.

ASSEMBLY INSTRUCTIONS - SCELBI CARD #: 1100-

CPU CARD

DESCRIPTION

The SCELBI #1100 CPU card is the primary card in a SCELBI-8B mini-computer. This card contains a microprocessor "cpu-on-a-chip," a network of control and timing logic, and a master clock system. All computer operations emanate from and terminate at this card. This card provides signals that control and synchronize the overall operations of all other cards in a SCELBI-8B system.

NOTE

If the customer has purchased the option, the SCELBI #1100 CPU card is shipped with a number of components already installed. These components are the network of parts that form the master clock system. The master clock system forms a critical portion of a SCELBI-8B minicomputer as the master clock must be carefully adjusted in order to insure proper computer operation. For those who purchased the option of having the master clock installed and adjusted at the factory, the resistive trimpots used to make the master clock adjustments have been sealed to prevent their being accidently altered. Customers are cautioned not to tamper with the trimpot adjustments once they have been set by the factory.

KIT ASSEMBLY

You should refer to the assembly drawing shown on the next page during the assembly process. The drawing is to scale and shows the exact location of each part on the P.C. card.

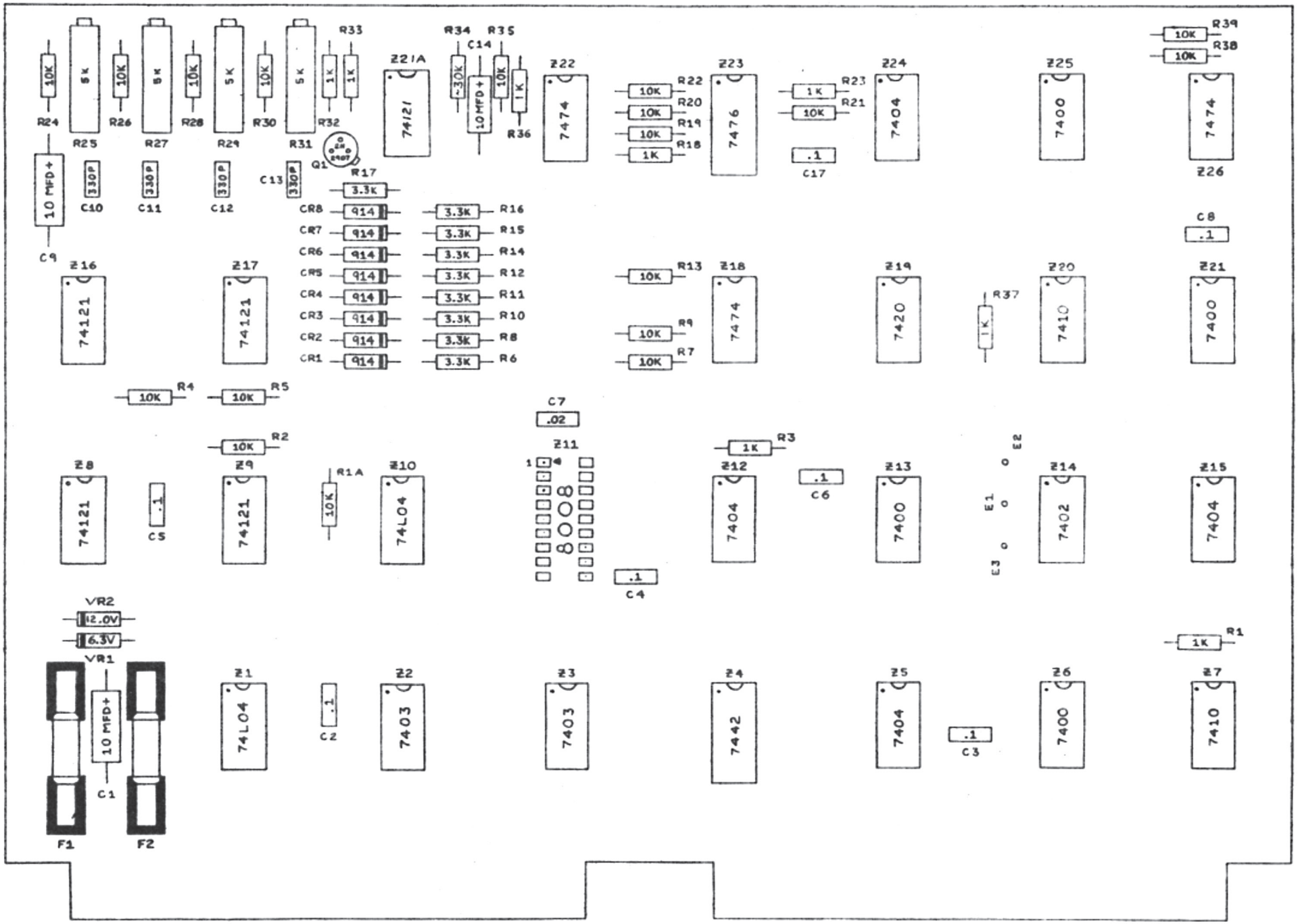
INSTALLATION OF INTEGRATED CIRCUITS

( ) Install four type 7400 integrated circuits in the locations labeled on the assembly drawing as: Z6, Z13, Z21 and Z25. When all four have been installed turn the card over and solder the pins on each I.C. to their foil pad.

( ) Install a type 7402 I.C. at the location specified for Z14 on the assembly drawing. Solder the pins of the integrated circuit to the card.

( ) Install and solder two type 7403 integrated circuits at the locations shown for Z2 and Z3.

( ) Install and solder four type 7404 integrated circuits at locations Z5, Z12, Z15 and Z24.


R24 10K
R25 5K
R26 10K
R27 5K
R28 10K
R29 5K
R30 10K
R31 5K
R32 1K
R33 1K
C9 10 MFD+
C10 330P
C11 330P
C12 330P
C13 330P
Q1
Z21A 74121
R34 30K
C14 10 MFD+
R35 10K
R36 1K
Z22 7474
R22 10K
R20 10K
R19 10K
R18 1K
Z23 7476
R23 1K
R21 10K
C17 .1
Z24 7404
Z25 7400
R39 10K
R38 10K
Z26 7474
C8 .1
R17 3.3K
CR8 914
CR7 914
CR6 914
CR5 914
CR4 914
CR3 914
CR2 914
CR1 914
R16 3.3K
R15 3.3K
R14 3.3K
R12 3.3K
R11 3.3K
R10 3.3K
R8 3.3K
R6 3.3K
Z16 74121
Z17 74121
R13 10K
R9 10K
R7 10K
Z18 7474
Z19 7420
R37 1K
Z20 7410
Z21 7400
R4 10K
R5 10K
C7 .02
R2 10K
Z11 8008
R3 1K
Z8 74121
C5 .1
Z9 74121
R1A 10K
Z10 74L04
Z12 7404
C6 .1
Z13 7400
E1
E2
E3
Z14 7402
Z15 7404
C4 .1
VR2 12.0V
6.3V
VR1
C1 10 MFD+
F1
F2
Z1 74L04
C2 .1
Z2 7403
Z3 7403
Z4 7442
Z5 7404
C3 .1
Z6 7400
Z7 7410
R1 1K

( ) Install and solder two type 74l04 (low power) integrated circuits at locations Z1 and Z10.

( ) Install and solder two type 7410 integrated circuits at locations Z7 and Z20.

( ) Install and solder a type 7420 I.C. at location Z19.

( ) Install and solder a type 7442 I.C. at location Z4.

( ) Install and solder three type 7474 integrated circuits at locations Z18, Z22 and Z26.

( ) Install and solder a type 7476 I.C. at location Z23.

( ) Install and solder fiive type 74121 integrated circuits at locations Z8, Z9, Z16 Z17 and Z21a.

INSTALLATION OF RESISTORS

( ) Install eight 1 K ohm (brn-blk-red) 1/4 watt resistors at the locations shown on the assembly drawing for: R1, R3 RL8, R23, R32, R33, R36 and R37.

( ) Install nine 3.3 K ohm (or-or-red) 1/4 watt resistors at the locations shown for R6, R8, RI0, R11, R12, R14, R15, R16 and R17.

( ) Install eighteen 10 K ohm (brn-blk-or) 1/4 watt resistors at the locations shown for: R1a, R2, R4, R5, R7, R9, R13, R19, R20, R21, R22, R24, R26, R28, R30, R35, R38 and R39.

( ) Install a 33 K ohm (or-or-or) 1/4 watt resistor at the location shown for R34.

( ) Install four 5 K ohm trimpots at the locations shown for R25, R27, R29 and R31.

INSTALLATION OF DIODES

( ) Install eight computer diodes at the locations shown for: CR1 through CR8.

( ) Install one 6.3 Volt zener diode at the location shown for VR1. Be sure and observe correct polarity as indicated on the drawing.

( ) Install one 12.0 Volt zener diode at the location shown for VR2. Observe correct polarity!

TRANSISTOR INSTALLATION

( ) Install a type 2n2907 transistor at the location shown on the assembly drawing for Q1. The body of the transistor should be spaced about 1/8 inch away from the P.C. card. As an aid in maintaining this distance as the transistor is installed, place a paper match stick under the transistor when the transistor leads are first inserted in their holes. Push the transistor lead through the card until the body is touching the match stick. Then turn the card over bend the transistor leads against their respective foil pads, trim the excess lead material off leaving 1/16 inch of lead to be soldered to the foil pad. Solder the leads of the transistor. Then, remove the matchstick that was used as a spacer. Note: when installing the transistor be sure that the small tab on the body of the transistor (denoting the emitter junction lead of the device) is oriented in the direction shown on the assembly drawing.

INSTALLATION OF CAPACITORS

( ) Install three 10 MFD electrolytic. Capacitors in the positions labeled on the assembly drawing as:. Cl, C9 and C14. Be certain that the positive (+) end of the capacitor is oriented in the same direction as that shown on the drawing (and indicated on the P.C. card). As each capacitor is installed bend the leads down onto their foil pads on the back side of the board and trim off the excess lead. Then solder each capacitor lead to it's foil connection point.

( ) Install seven .1 UFD disk capacitors in the positions labeled on the assembly drawing as: C2, C3, C4, C5, C6, C8 and C17. Trim the leads and solder the capacitors in place.

( ) Install and solder in place a .02 Ufd disk capacitor at the location specified on the assembly drawing for C7.

( ) Install and solder in place four 330 pf disk capacitors at the locations for: C10, Cl1, Cl2 and C13.

INSTALLATION OF FUSE CLIPS

( ) Install the four P.C. mouting fuse clips in the positions shown to hold F1 and F2. Insert the two tabs on the base of each clip into the holes provided, bend the tabs slightly against the foil on the other side of the card to hold them in place and then solder each tab to the foil. Ensure that the clips line up so that a fuse will seat properly when installed.

INITIAL INSPECTION AND TESTING

( ) At this time carefully inspect both sides of the board to ascertain that there are not any solder shorts between P.C. foil lands. Be especially observant on the component side of the card around the I.C. pins. Remove any solder shorts that are found.

( ) Install a 0.75 Amp. type 8AG fuse in the fuse clips for F1.

( ) Temporarily "jumper" the fuse clips for F2 with a piece of wire or a length of solder.

( ) Use an ohm meter to make the following measurements:

Meter between pins A1 and A3 of the card connector - and then reverse the meter leads to obtain a second reading. The reading in both directions should be greater than five (5) ohms. (One reading will typically be several times higher than the other.) If the readings are less than 5 ohms look for solder shorts between the +5 volt supply lines and the common return lines on the card.

Now repeat the above readings between pins A3 and A5 of the card connector. This time the reading in one direction should be very high (greater than 50 K ohms) and the reading with the meter leads reversed should be greater than five (5) ohms. If this is not the case, look for solder shorts between the -9 volt supply lines and the common return lines on the card.

Finally, take similar readings between pins A1 and A5 of the card. The reading in one bdirection should be more than 50 K ohms, and in the other more than five (5) ohms. If not, look for solder shorts between the +5 volt and -9 volt supply lines on the card.

( ) Remove the jumper from the fuse clips at F2 and install a 1/8 ampere type 8AG fuse.

ADJUSTING THE MASTER CLOCK

If you purchased a CPU card that did not have the master clock cicuit installed and adjusted you should refer to the appendix on the next page and perform the clock circuit adjustments before going further. If you purchased a CPU card with the clock circtuitry already installed and adjusted you may proceed directly to the next step.

INSTALLATION OF THE '8008' INTEGRATED CIRCUIT

( ) Before installing the 8008 integrated circuit take a short piece of wire and install a jumper between the foil pads on the card marked "E1" and "E2" (next to I.C. Z14). Make sure the jumper does not short to any of the foil lands that it crosses over.

( ) The 8008 "cpu-on-a-chip" requires an 18 pin socket which may be readily fashioned using "MOLEX" (RTM) pins. The 8008 should be installed in its socket at Z11 making sure that the small dot or arrow which designates pin 1 on the I.C. is oriented as shown on the assembly drawing. When installing the '8008' take extreme care to ensure that each pin fits into it's individual clip of the "MOLEX" socket. Do not force the device into it's socket as this may subsequently bend and possibly break I.C. pins. When the I.C. is fully seated in the socket check to see that none of the MOLEX pins are shorting to an adjacent pin.

FINAL TESTING

Final testing of the card must be done when the card is installed in a SCELBI-8B minicomputer system.

ADJUSTING THE MASTER CLOCK CIRCUITRY ON THE SCELBI #1100 CPU CARD

The master clock circuitry for the SCELBI-8B mini-computer is on the SCELBI #1100 CPU card. This circuitry must be adjusted correctly or the unit will not function properly. To adjust the master clock circuitry, you will need the following instruments.

1. A frequency counter.

2. A good oscilloscope, either a dual trace, or a single trace unit that can be "externally" triggered.

ADJUSTMENT SETUP

Connect a +5 volt supply between pins A1 (+) and A3 (common) of the CPU card. (The card may be placed on your work bench - it does not have to be installed in a chassis or system.) The +5 volt supply should be controlled by a switch so that power can be applied and removed at will.

Connect the "A" trace of a dual trace scope and set the scope to trigger on sweep "A," or, if a single trace scope is being used attach the "external" trigger lead to pin 6 of I.C. Z8. (This signal can also be readily accessed at the left lead of resistor R2.) This signal will be designated "clock phase 1" for this discussion.

Connect a frequency counter to pin 6 of Z17 (or pick up the signal on the right lead of resistor R1.) This signal is designated "clock phase 2." If you are using a dual trace scope you may also connect trace "B" to this point. Otherwise, use this point to examine "clock phase 2" when necessary during the adjustment procedure.

Naturally, both the oscilloscope and the frequency counter should have their common terminals connected to the common point on the CPU card (at pin A3.)

ADJUSTMENT PROCEDURE

The master clock circuit has a "self starting" network consisting of resistor R24 and capacitor C9. In order for the circuit to start two conditions must be met. First, the power supply voltage must come on rapidly when power is applied to the card, and second, the clock circuit must be adjusted within its oscillating range.

The first step in the adjustment procedure is to apply power to the card and observe that a signal appears at "clock phase 1." If a signal does not appear, turn the power off, adjust trimpots R25 and R27 several turns and the re-apply power. Continue this procedure until a signal appears at "clock phase 1" when power is applied.

Customer's who provide their own power supplies should be cautioned that some power supplies, when turned on by a switch in the A.C. Line, will not build up to the proper D.C. Level at a fast enough rate to activate the clock circuit. In such cases, a switch should be installed in the D.C. Supply line to the computer. After the power supply has been initially turned on by the A.C. Line switch, and has had time to build up the proper voltage levels, the D.C. Switch can be used to connect the supply voltages to the computer.

Once a steady signal has appeared at “clock phase 1”, look for a signal at “clock phase 2.” If necessary, adjust trimpots R29 and R3l until a signal appears.

When a signal is present at both “clock phase 1” and “clock phase 2”, one may proceed to make the fine adjustments to the clock circuitry.

To make the fine adjustments go back and carefully adjust trimpots R25 and R27 until “clock phase 1” is high for approximately 850 nanoseconds and low for 1150 nano-seconds. Once the signal is close to this range observe the frequency counter and carefully tweak the trimpots for a frequency reading of 500 kilohertz while maintaining the indicated high/low ratios as closely as possible. Set the frequency as close to 500 kilohertz as practical - at least within plus or minus 5 KHz., preferably within several kilohertz.

Next, with the scope being triggered by “clock phase 1,” observe “clock phase 2.” Use trimpots R29 and R31 to obtain the following conditions. “Clock phase 2” should go high arout 200 nano-seconds after the fall of “clock phase 1,” and should remain high for approximately 550 nano-seconds. When this condition is met, and “clock phase 1” has been properly adjusted, the distance between the fall of “clock phase 2” and the rise of “clock phase 1” will be about 400 nano-seconds.

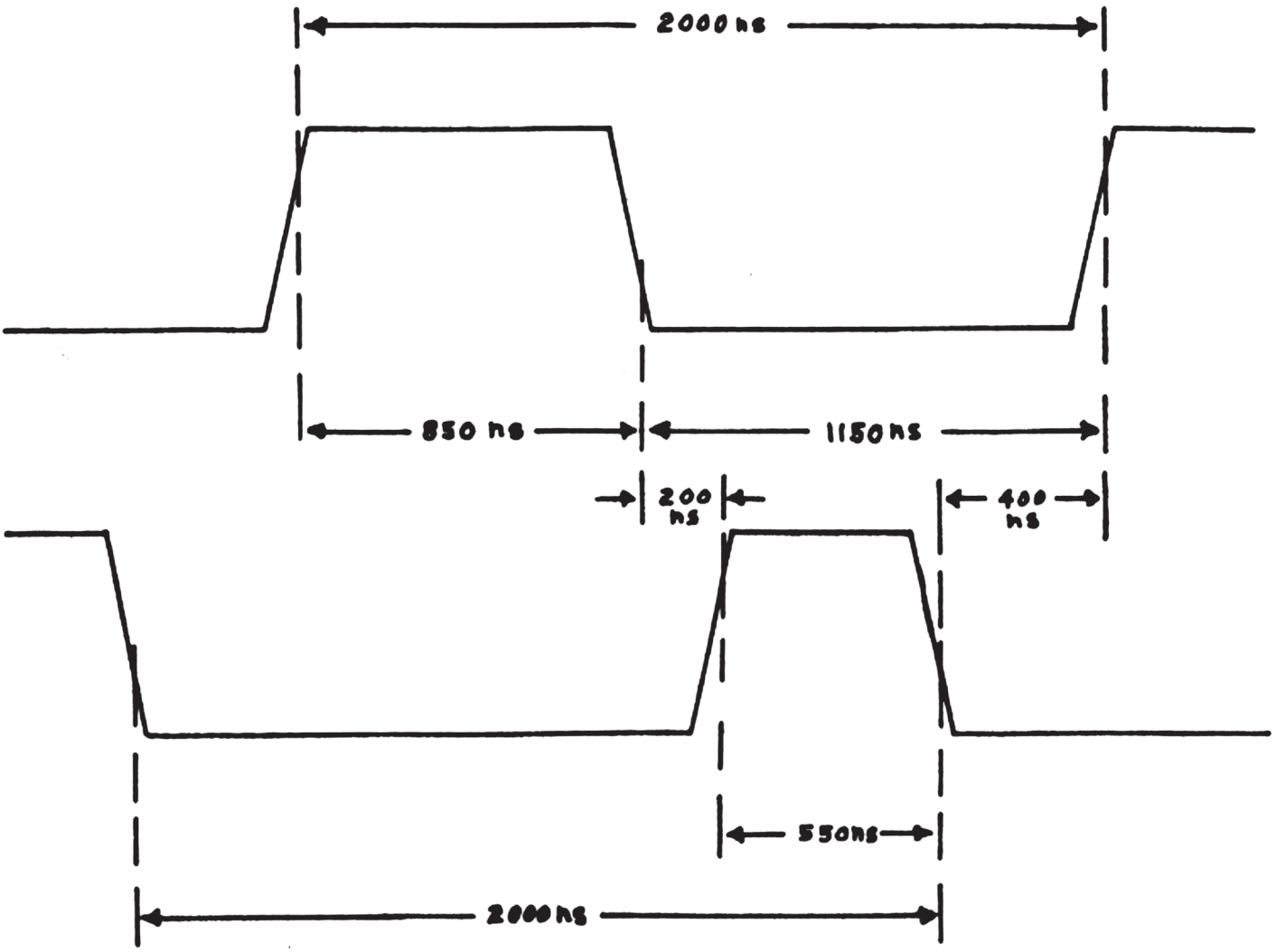
Note! If at any time during the adjustment procedure the clock signal(s) disappear it will be necessary to re-apply power to restart the clock.

When “clock phase 1” and “clock phase 2” have been adjusted for the waveforms as described, you should allow the circuit to operate for approximately 30 minutes and then recheck the frequency. You may make minor adjustments to bring the frequency to 500 KHz. After the circuit has been operating for this period. This completes the master clock circuitry adjustment procedure.

A summary of the adjustment limits and a pictorial of the waveforms and timing relationships is shown on the next page.

CLOCK PERIOD (Phase 1 or 2):	2,000 Nano-seconds +/- 100 Nano-seconds
Minimum pulse width at CLOCK PHASE 1:	700 Nano-seconds
Minimum pulse width Of CLOCK PHASE 2:	550 Nano-seconds
Minimum delay from fall of PHASE 1 to rise of PHASE 2:	200 Nano-seconds
Minimum delay from fall of PHASE 2 to rise of PHASE 1:	400 Nano-seconds
Minimum delay from fall of PHASE 1 to fall of PHASE 2:	700 Nano-seconds
Maximum delay from fall of PHASE 1 to fall of PHASE 2:	1,100 Nano-seconds

REPRESENTATIVE WAVEFORMS



SCELBI COMPUTER CONSULTING INC.

ASSEMBLY INSTRUCTIONS - SCELBI CARD #: 1101-

DBB & OUTPUT CARD

DESCRIPTION

The SCELBI #1101 DBB & Output card contains memory address and state control latches and logic for selecting banks of memory words. In addition the card contains multiplexing logic for selecting output ports. While the card is capable of selecting 16 different output ports, if it is installed in a standard SCELBI-8B chassis only eight of the output ports will be wired to the I/O connectors on the back of the chassis unit.

KIT ASSEMBLY

You should refer to the assembly drawing shown on the next page during the assembly process. The drawing is to scale and shows the exact location of each part on the P.C. card.

INSTALLATION OF INTEGRATED CIRCUITS

( ) Install two type 7400 integrated circuits in the locations labeled on the assembly drawing as: Z13 & Z16A. When they have been installed turn the card over and solder the pins on the I.C. to their foil pad.

( ) Install four type 7402 integrated circuits at the locations specified for Z1, Z2, Z4 and Z5. Then solder the pins of the integrated circuits to the card foil.

( ) Install and solder two type 7416 integrated circuits at the locations shown for Z10 and Z16.

( ) Install and solder two type 7417 integrated circuits at the locations shown for Z3 and Z15.

( ) Install and solder four type 7442 integrated circuits at the locations shown for Z11, Z12, Z14 and Z17.

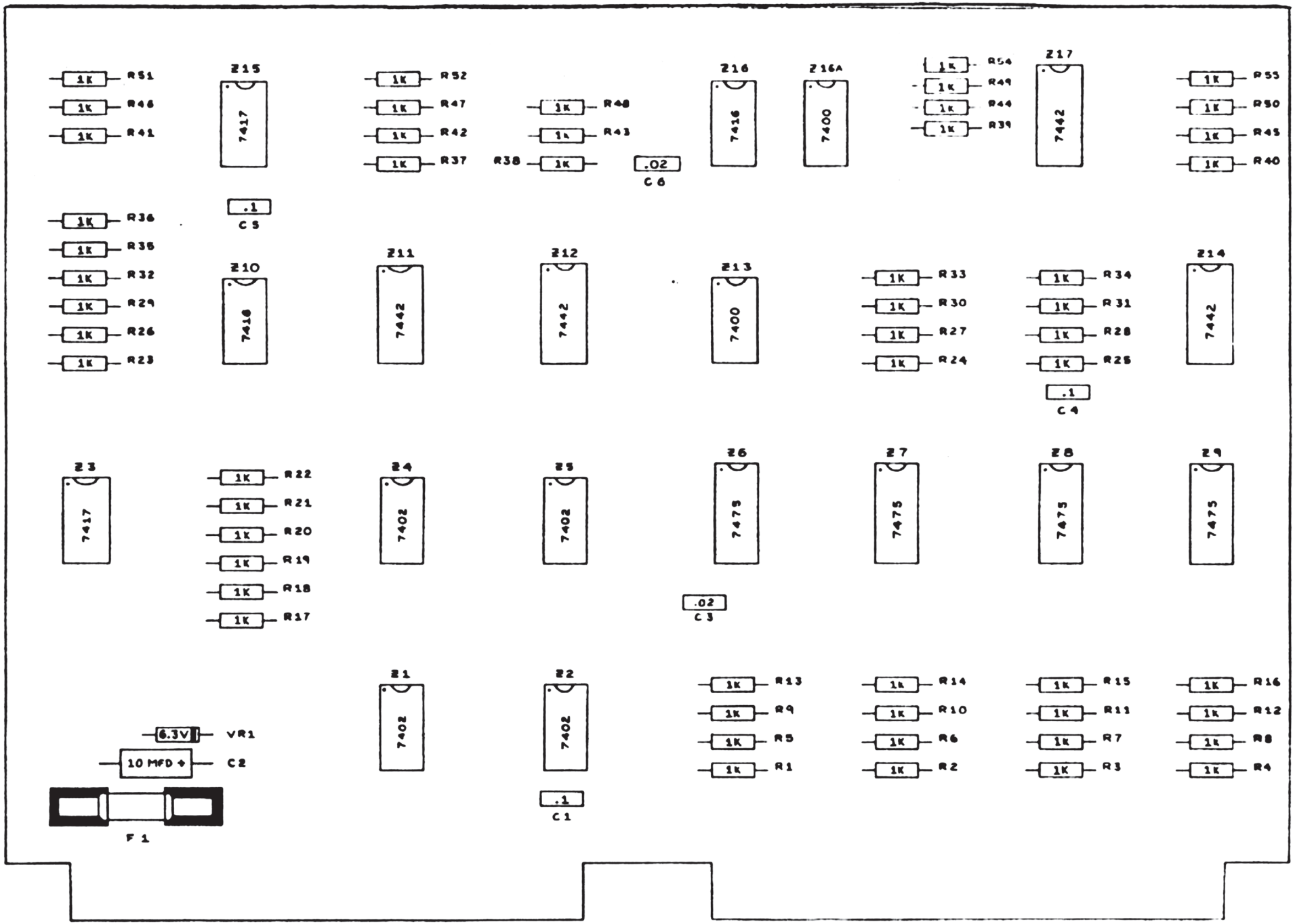
( ) Install and solder four type 7475 integrated circuits at the locations shown for Z6, Z7, Z8 and Z9.

INSTALLATION OF RESISTORS

( ) Install fifty-four 1 K ohm (BRN-BLK-RED) 1/4 watt resistors at the locations shown on the assembly drawing for R1 through R52, as well as R54 and R55. (R53 designation not used.)

INSTALLATION OF DIODES

( ) Install one 6.3 volt zener diode at the location shown for VR1. Be sure and observe correct polarity as indicated on the drawing


1K R51
1K R46
1K R41
Z15
7417
1K R52
1K R47
1K R42
1K R37
1K R48
1K R43
R38 1K
.02
C6
Z16
7416
Z16A
7400
1K R54
1K R49
1K R44
1K R39
Z17
7442
1K R55
1K R50
1K R45
1K R40
.1
C5
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1K R35
1K R32
1K R29
1K R26
1K R23
Z10
7416
Z11
7442
Z12
7442
Z13
7400
1K R33
1K R30
1K R27
1K R24
1K R34
1K R31
1K R28
1K R25
.1
C4
Z14
7442
Z3
7417
1K R22
1K R21
1K R20
1K R19
1K R18
1K R17
Z4
7402
Z5
7402
Z6
7473
Z7
7473
Z8
7473
Z9
7473
.02
C3
Z1
7402
Z2
7402
1K R13
1K R9
1K R5
1K R1
1K R14
1K R10
1K R6
1K R2
1K R15
1K R11
1K R7
1K R3
1K R16
1K R12
1K R8
1K R4
6.3V
VR1
10 MFD +
C2
F 1
.1
C1

INSTALLATION OF CAPACITORS

( ) Install one 10 MFD electrolytic capacitor in the position labeled on the assembly drawing for C2. Be certain that the positive (+) end of the capacitor is oriented in the same direction as that shown on the drawing and indicated on the P.C. card.

( ) Install three .1 UFD disk capacitors in the positions labeled on the assembly drawing as: C1, C4 and C5.

( ) Install two .02 UFD disk capacitors at the locations identified on the assembly drawing for C3 and C6.

INSTALLATION OF FUSE CLIPS

( ) Install the two P.C. Mounting fuse clips in the positions shown to hold fuse F1. Insert the two tabs on the base of each clip into the holes provided for each clip, bend the tabs slight against the foil on the other side of the board to hold them in place and then solder each tab to the foil. Ensure that the clips line up so that a fuse will seat properly when installed.

( ) Install a 1.0 ampere type 8AG fuse in the fuse clips for F1.

INITIAL INSPECTION AND TESTING

( ) At this time carefully inspect both sides of the board to ascertain that there are not any solder shorts between P.C. foil lands. Be especially observant on the component side of the card around the I.C. pins. Remove any solder shorts that are found.

( ) Use an ohm meter to make the following measurements:

Meter between pins A1 and A3 of the card connector - and then reverse the meter leads to obtain a second reading. The reading in both directions should be greater than five (5) ohms. (One reading will typically be several times higher than the other.) If the readings are less than five ohms look for solder shorts between the +5 volt supply lines and the common return lines on the card.

FINAL TESTING

Final testing of the card must be done when the card is installed in a SCELBI-8B minicomputer system.

SCELBI COMPUTER CONSULTING1 INC.

ASSEMBLY INSTRUCTIONS - SCELBI CARD #: 1102-

INPUT CARD

DESCRIPTION

The SCELBI #1102 Input card contains multiplexing logic which selects the input to the central processor unit. The card allows the input to the ”CPU” to arrive from the memory banks, the console switches (which are used to allow control of the computer by manual means), or any one of six different input ports.

KIT ASSEMBLY

You should refer to the assembly drawing shown on the next page during the assembly process. The drawing is to scale and shows the exact location of each part on the P.C. card.

INSTALLATION OF INTEGRATED CIRCUITS

( ) Install a type 7400 integrated circuit in the location labeled on the assembly drawing as Z5. When it has been installed, turn the card over and solder the pins on the I.C. to their foil pad.

( ) Install a type 7404 integrated circuit at the location specified for Z11. Then solder the pins of the I.C. to the card.

( ) Install and solder a type 7410 I.C. at the location shown for Z6.

( ) Install and solder eight type 74151 integrated circuits at the locations shown for: Z1, Z2, Z3, Z4, Z7, Z8, Z9 and Z10.

INSTALLATION OF RESISTORS

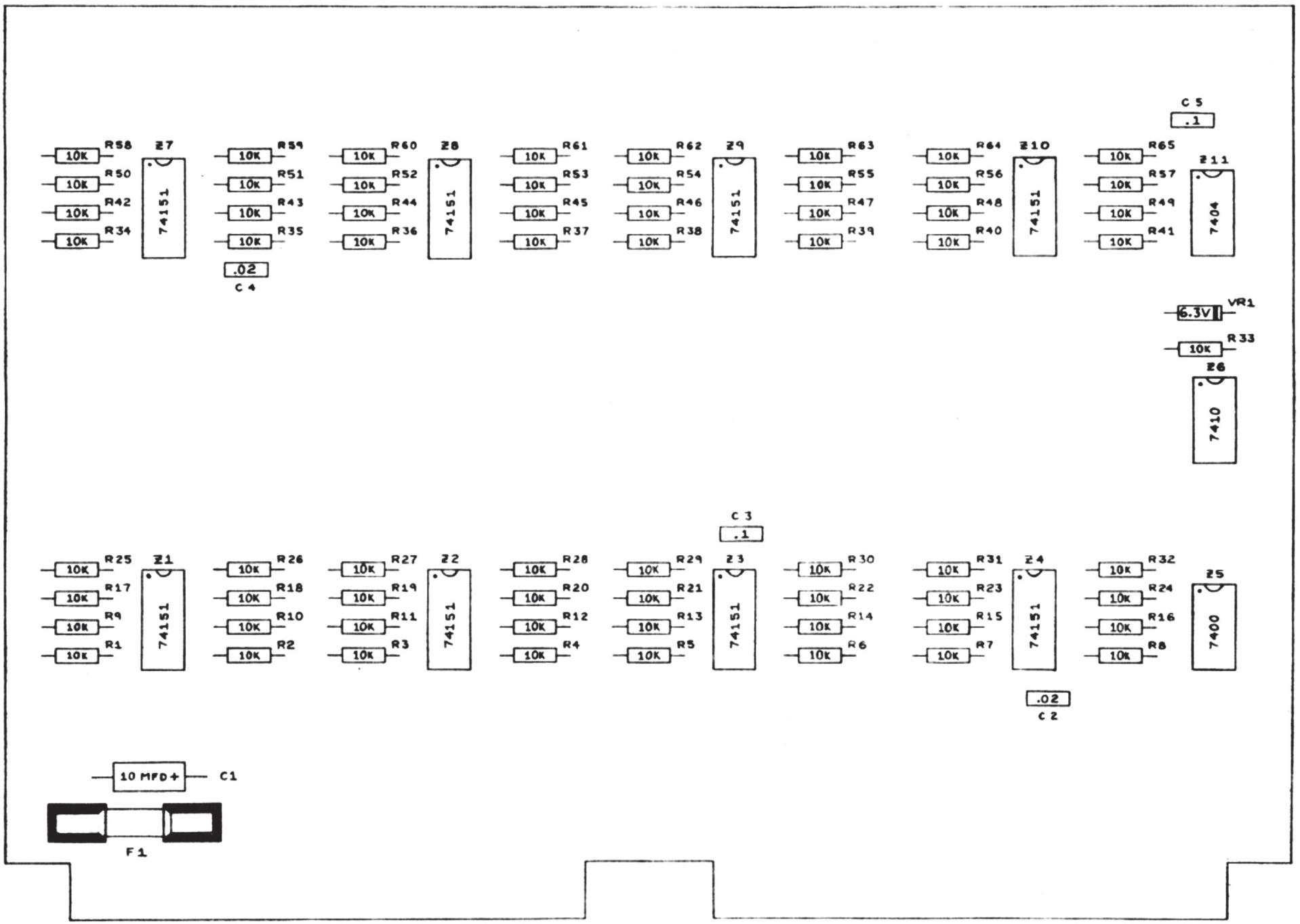
( ) Install sixty five 10 K ohm (BRN-BLK-OR) 1/4 watt resistors at the locations shown on the assembly drawing for R1 through R65.

INSTALLATION OF DIODES

( ) Install one 6.3 volt zener diode at the location shown for VR1. Be sure and observe correct polarity as indicated on the drawing.

INSTALLATION OF CAPACITORS

( ) Install one 10 MFD electrolytic capacitor in the position labeled on the drawing for C1. Be certain that the positive (+) end of the capacitor is oriented in the same direction as that shown on the drawing and indicated on the P.C. card.


C 5
.1
R58
10K
R50
10K
R42
10K
R34
10K
Z7
74151
R59
10K
R51
10K
R43
10K
R35
10K
.02
C 4
R60
10K
R52
10K
R44
10K
R36
10K
Z8
74151
R61
10K
R53
10K
R45
10K
R37
10K
R62
10K
R54
10K
R46
10K
R38
10K
Z9
74151
R63
10K
R55
10K
R47
10K
R39
10K
R64
10K
R56
10K
R48
10K
R40
10K
Z10
74151
R65
10K
R57
10K
R49
10K
R41
10K
Z11
7404
6.3V
VR1
R33
10K
Z6
7410
C 3
.1
R25
10K
R17
10K
R9
10K
R1
10K
Z1
74151
R26
10K
R18
10K
R10
10K
R2
10K
R27
10K
R19
10K
R11
10K
R3
10K
Z2
74151
R28
10K
R20
10K
R12
10K
R4
10K
R29
10K
R21
10K
R13
10K
R5
10K
Z3
74151
R30
10K
R22
10K
R14
10K
R6
10K
R31
10K
R23
10K
R15
10K
R7
10K
Z4
74151
.02
C 2
R32
10K
R24
10K
R16
10K
R8
10K
Z5
7400
10 MFD+
C1
F1

( ) Install two .1 UFD disk capacitors in the positions labeled on the assembly drawing as: C3 and C5.

( ) Install two .02 UFD disk capacitors in the positions labeled on the assembly drawing as: C2 and C4.

INSTALLATION OF FUSE CLIPS

( ) Install the two P.C. mounting fuse clips in the positions shown to hold fuse F1. Insert the two tabs on the base of each clip into the holes provided, bend the tabs slightly against the foil on the other side of the card to hold them in place and then solder each tab to the foil. Ensure that the clips line up so that a fuse will seat properly when installed.

INITIAL INSPECTION AND TESTING

( ) At this time carefully inspect both side of the board to ascertain that there are not any solder shorts between P.C. foil lands. Be especially observant on the component side of the card around the I.C. pins. Remove any solder shorts that are found.

( ) Install a 3/8 ampere type 8AG fuse in the fuse clips for F1.

( ) Use an ohm meter to make the following measurements:

Meter between pins A1 and A3 of the card connector - and the reverse the meter leads to obtain a second reading. The reading in both directions should be greater than five (5) ohms. (One reading will typically be several times higher than the other.) If the readings are less than five ohms look for solder shorts between the +5 volt supply lines and the common return lines on the card.

FINAL TESTING

Final testing of the card must be done when the card is installed in a SCEL-BI-8B minicomputer chassis unit.

SCELBI COMPUTER CONSULTING, INC.

ASSEMBLY INSTRUCTIONS - SCELBI CARD #: 1104-

FRONT PANEL CARD

DESCRIPTION

The SCELBI #1104 Front Panel card has been specially designed to allow a SCELBI-8B user to monitor the operation of a SCELBI-8B mini-computer. The card contains an array of logic circuitry and long lasting solid state light emitting diodes which allow the operator to display the contents of memory locations, internal CPU register contents, critical cycle states and the general status of the CPU and I/O operations. The card also contains power supply voltage monitor indicators.

KIT ASSEMBLY

You should refer to the assembly drawing shown on the next page during the assembly process. The drawing is to scale and shows the exact location of each part on the P.C. Card.

INSTALLATION OF INTEGRATED CIRCUITS

( ) Install two type 74L04 (low power) integrated circuits in locations labeled on the assembly drawing as: Z1 and Z3. When the two have been installed turn the card over and solder pins on each I.C. to their foil pad.

( ) Install three type 7416 integrated circuits at the locations specified for: Z5, Z6 and Z7. Then solder the pins of the integrated circuits to the card.

( ) Install and solder two type 7475 integrated circuits at the locations shown for: Z2 and Z4.

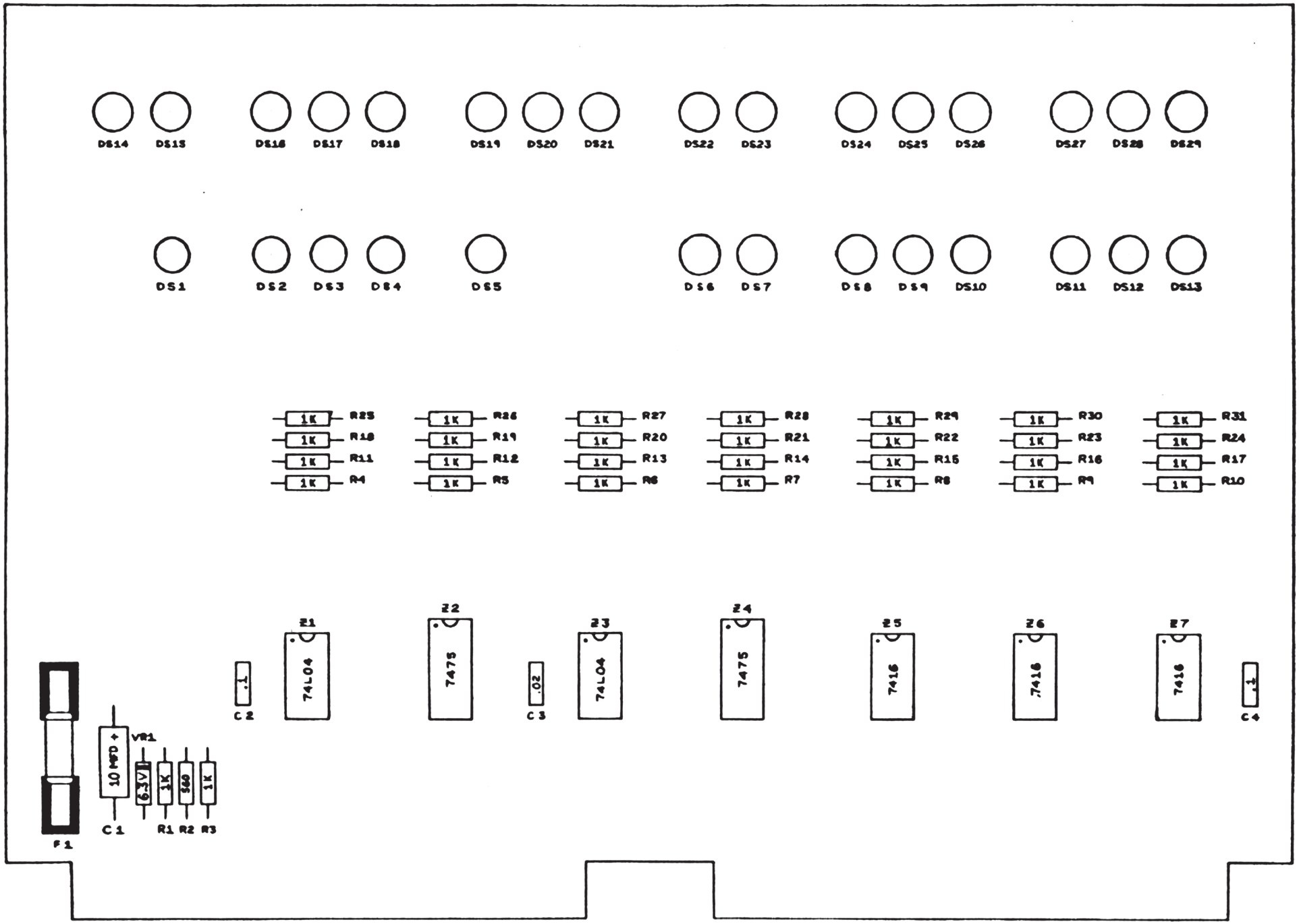
INSTALLATION OF RESISTORS

( ) Install one 560 ohm (GRN-BLU-BRN) 1/4 watt resistor at the location shown on the assembly drawing for R2.

( ) Install a 1 K ohm (BRN-BLK-RED) 1/4 watt resistor at the location shown for R1. Then install twenty nine more 1 K ohm 1/4 watt resistors at locations R3 through R31.

INSTALLATION OF DIODES

( ) Install one 6.3 volt zener diode at the location shown for VR1. Be sure and observe correct polarity as indicated on the drawing.


DS14 DS15 DS16 DS17 DS18 DS19 DS20 DS21 DS22 DS23 DS24 DS25 DS26 DS27 DS28 DS29
DS1 DS2 DS3 DS4 DS5 DS6 DS7 DS8 DS9 DS10 DS11 DS12 DS13
1K R25 1K R18 1K R11 1K R4
1K R26 1K R19 1K R12 1K R5
1K R27 1K R20 1K R13 1K R6
1K R28 1K R21 1K R14 1K R7
1K R29 1K R22 1K R15 1K R8
1K R30 1K R23 1K R16 1K R9
1K R31 1K R24 1K R17 1K R10
Z1 74L04
Z2 7475
Z3 74L04
Z4 7475
Z5 7416
Z6 7416
Z7 7416
C2 .1
C3 .02
C4 .1
F1
C1 10 MFD +
VR1 6.3V
R1 1K
R2 560
R3 1K

INSTALLATION OF CAPACITORS

( ) Install one 10 MFD electrolytic capacitor in the position labeled on the drawing for C1. Be certain that the positive (+) end of the capacitor is oriented in the same direction as that shown on the drawing and indicated on the P.C. card.

( ) Install two .1 UFD disk capacitors in the positions labeled on the drawing as: C2 and C4.

( ) Install one .02 UFD disk capacitor at the location identified on the assembly drawing for C3.

INSTALLATION OF LIGHT EMITTING DIODES

( ) Install twenty nine type MV520 light emitting diodes in the positions labeled on the drawing for DS1 through DS29. The anode of the L.E.D. (shorter lead) goes in the top most hole (furthest away from the card connector). The cathode of the L.E.D. (longer lead) goes in the bottom hole. Push the diode leads through the hole until the wider portion of the leads are flush with the board. Then turn the card over, solder the leads to the foil, and trim off the excess lead.

INSTALLATION OF FUSE CLIPS

( ) Install the two P.C. mounting fuse clips in the positions shown to hold fuse F1. Insert the two tabs on the base of each clip into the holes provided, bend the tabs slightly against the foil on the other side of the card to hold them in place and then solder each tab to the foll. Ensure that the clips line up so that a fuse will seat properly when installed.

INITIAL INSPECTION AND TESTING

( ) At this time carefully inspect both sides of the card to ascertain that there are no solder shorts between P.C. foil lands. Be especially observant on the component side of the card around the I.C. pins. Remove any solder shorts that are formed.

( ) Install a 3/8 ampere type 8AG fuse in the fuse clips for F1.

( ) Use an ohm meter to make the following measurements:

Meter between pins Al and 3 of the card connector - and then reverse the meter leads to obtain a second reading. The reading in both directions should be greater than five (5) ohms. (One reading will typically be several times higher than the other.) If the readings are less than five ohms look for solder shorts between the +5 volt supply lines and the common return lines on the card.

Now repeat the above readings between pins A3 and A5 of the card connector. This time the readings in both directions should be greater than 50 ohms. If this is not the case, look for solder shorts between the -9 volt supply lines and the common return lines on the card.

Finally, take similar readings between pins A1 and A5 of the card connector. Again the readings in both directions should be greater than 50 ohms. If not, look for solder shorts between the +5 volt and -9 volt supply lines on the

P.C. card.

FINAL TESTING

Final testing of the card must be accomplished when the card is installed in a SCELBI-8B mini-computer chassis unit.

SCELBI COMPUTER CONSULTING. INC.

ASSEMBLY INSTRUCTIONS - SCELBI CARD #: 1106-

MEMORY EXPANSION CARD

DESCRIPTION

The SCELBI #1106 Memory Expansion card contains memory address logic which enables the computer to select the desired "page" of memory in a system that may contain "pages" or "banks" of memory elements.

KIT ASSEMBLY

You should refer to the assembly drawing shown on the next page during the assembly process. The drawing is to scale and shows the exact location of each part on the P.C. card.

INSTALLATION OF INTEGRATED CIRCUITS

( ) Install nine type 7442 integrated circuits in the locations labeled on the assembly drawing as: Z1 - Z7. Z9 & Z10. When all nine have been installed turn the card over and solder the pins on each I.C. to their foil pad.

( ) Install a type 7417 I.C. at the location specified for Z8 on the assembly drawing. Solder the pins of the integrated circuit to the card.

INSTALLATION OF RESISTORS

( ) Install 67 10 k ohm (BRN-BLK-OR) 1/4 watt resistors at the locations shown on the assembly drawing for, R1 - R67.

INSTALLATION OF DIODES

( ) Install one 6.3 volt zener diode at the location shown for VR1. Be sure and observe correct polarity as indicated on the drawing.

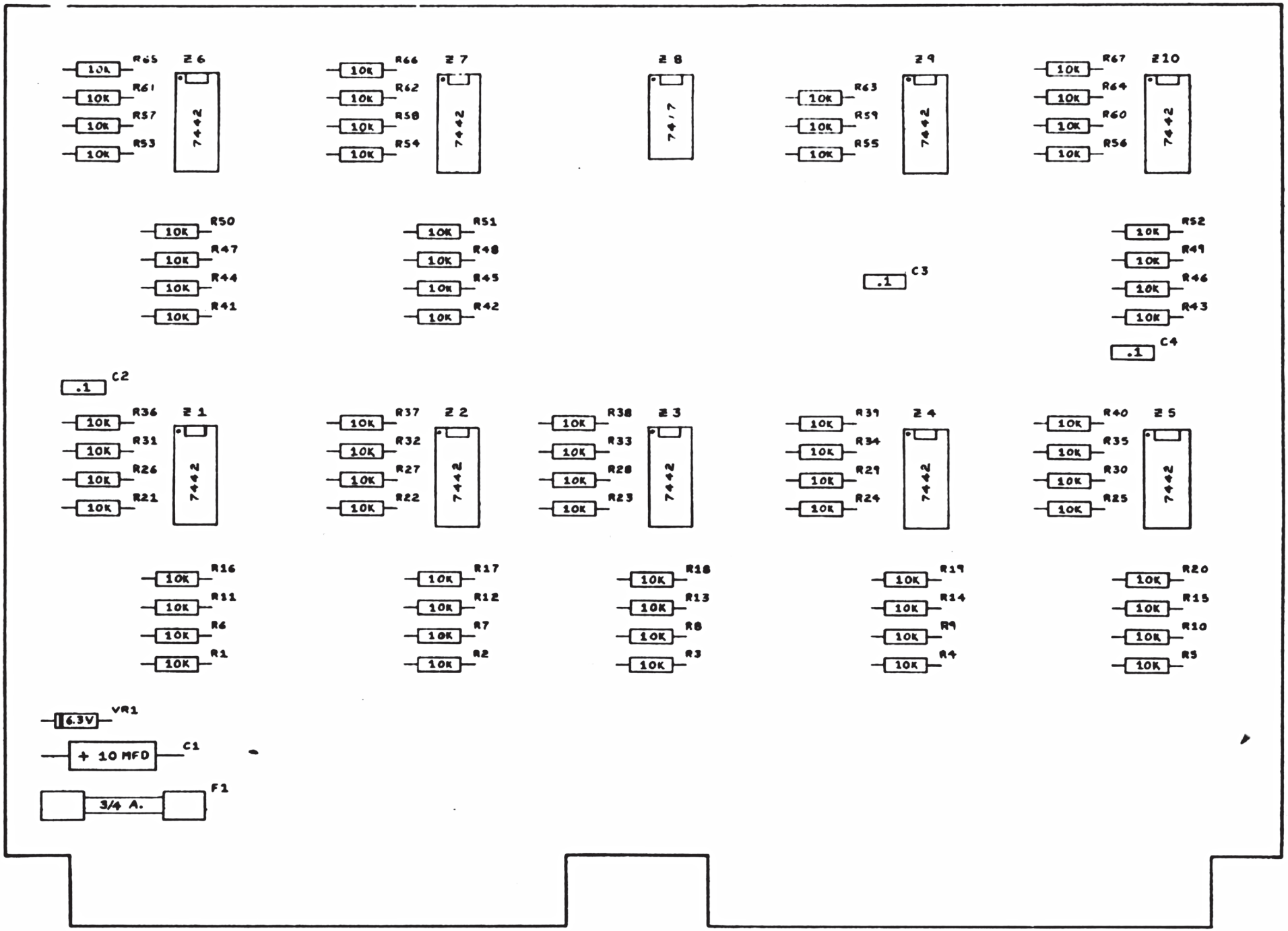
INSTALLATION OF CAPACITORS

( ) Install one 10 MFD electrolytic capacitor in the position labeled on the drawing for C1. Be certain that the positive (+) end of the capacitor is oriented in the same direction as that shown on the drawing and indicated on the P.C. card.

( ) Install three .1 UFD disk capacitors in the positions labeled on the drawing as: C2, C3 & C4.

INSTALLATION OF FUSE CLIPS

( ) Install the two P.C. mounting fuse clips in the positions shown to hold fuse F1. Insert the two tabs on the base of each clip into the holes provided. Bend the tabs slightly against the foil on the other side of the card to hold them in place and then solder each tab to the foil. Ensure that the clips line up so that a fuse will seat properly when installed.


10K R65
10K R61
10K R57
10K R53
Z 6
7442
10K R66
10K R62
10K R58
10K R54
Z 7
7442
Z 8
7417
10K R63
10K R59
10K R55
Z 9
7442
10K R67
10K R64
10K R60
10K R56
Z10
7442
10K R50
10K R47
10K R44
10K R41
10K R51
10K R48
10K R45
10K R42
.1 C3
10K R52
10K R49
10K R46
10K R43
.1 C4
.1 C2
10K R36
10K R31
10K R26
10K R21
Z 1
7442
10K R37
10K R32
10K R27
10K R22
Z 2
7442
10K R38
10K R33
10K R28
10K R23
Z 3
7442
10K R39
10K R34
10K R29
10K R24
Z 4
7442
10K R40
10K R35
10K R30
10K R25
Z 5
7442
10K R16
10K R11
10K R6
10K R1
10K R17
10K R12
10K R7
10K R2
10K R18
10K R13
10K R8
10K R3
10K R19
10K R14
10K R9
10K R4
10K R20
10K R15
10K R10
10K R5
6.3V VR1
+ 10 MFD C1
3/4 A. F1

INITIAL INSPECTION AND TESTING

( ) At this time carefully inspect both sides of the card to ascertain that there are no solder shorts between P.C. foil lands. Be especially observant on the component side of the card around the I.C. pins. Remove any solder shorts that are found.

( ) Install a 3/8 ampere type 8AG fuse in the fuse clips for F1.

( ) Use an ohm meter to make the following measurements.

Meter between pins at A1 and A3 of the card connector - and then reverse the meter leads to obtain a second reading. The reading in both directions should be greater than five (5) ohms. (One reading will be typically several times higher than the other.) If the reading(s) are less than five ohms look for solder shorts between the +5 volt supply lines and the common return limes on the card.

FINAL TESTING

Final testing of the card must be accomplished when the card is in-stalled in a SCELBI-8B minicomputer chassis unit.

SCELBI COMPUTER CONSULTING, INC.

ASSEMBLY INSTRUCTIONS - SCELBI CARD #: 1107-

4K RAM MEMORY CARD

DESCRIPTION

The SCELBI #1107 RAM memory card may be populated with type 2102 (static RAM) memory elements in groups of 1,024 words to a maximum of 4,096 words per card. The card also contains memory bank selection logic. These cards serve as the "read and write" memory bank(s) for a SCELBI-8B system. The standard SCELBI-8B chassis has P.C. card sockets to accept up to 16,384 words of memory to be used by the computer.

KIT ASSEMBLY

You should refer to the assembly drawing shown on the next page during the assembly process. The drawing is to scale and shows the exact location of each part on the P.C. card.

INSTALLATION OF INTEGRATED CIRCUITS

Notice. The following four steps detail the installation of the RAM memory integrated circuits for an 1107- card supplied with 4,096 words of memory (32 memory chips). If you purchased a board with less memory. Then perform the steps in order for each group of eight memory chips provided.

( ) Install eight type 2102 integrated circuits in the locations labeled on the drawing as Z29 - Z36. When all eight have been installed turn the card over and solder the pins on each I.C. to their foil pad. (This provides four pages of memory on the four lowest valued select lines for the card.)

( ) Install eight type 2102 integrated circuits 1m the locations labeled on the drawing as Z21 - Z28. (This provides four pages of memory on the next higher order select limes for the card.)

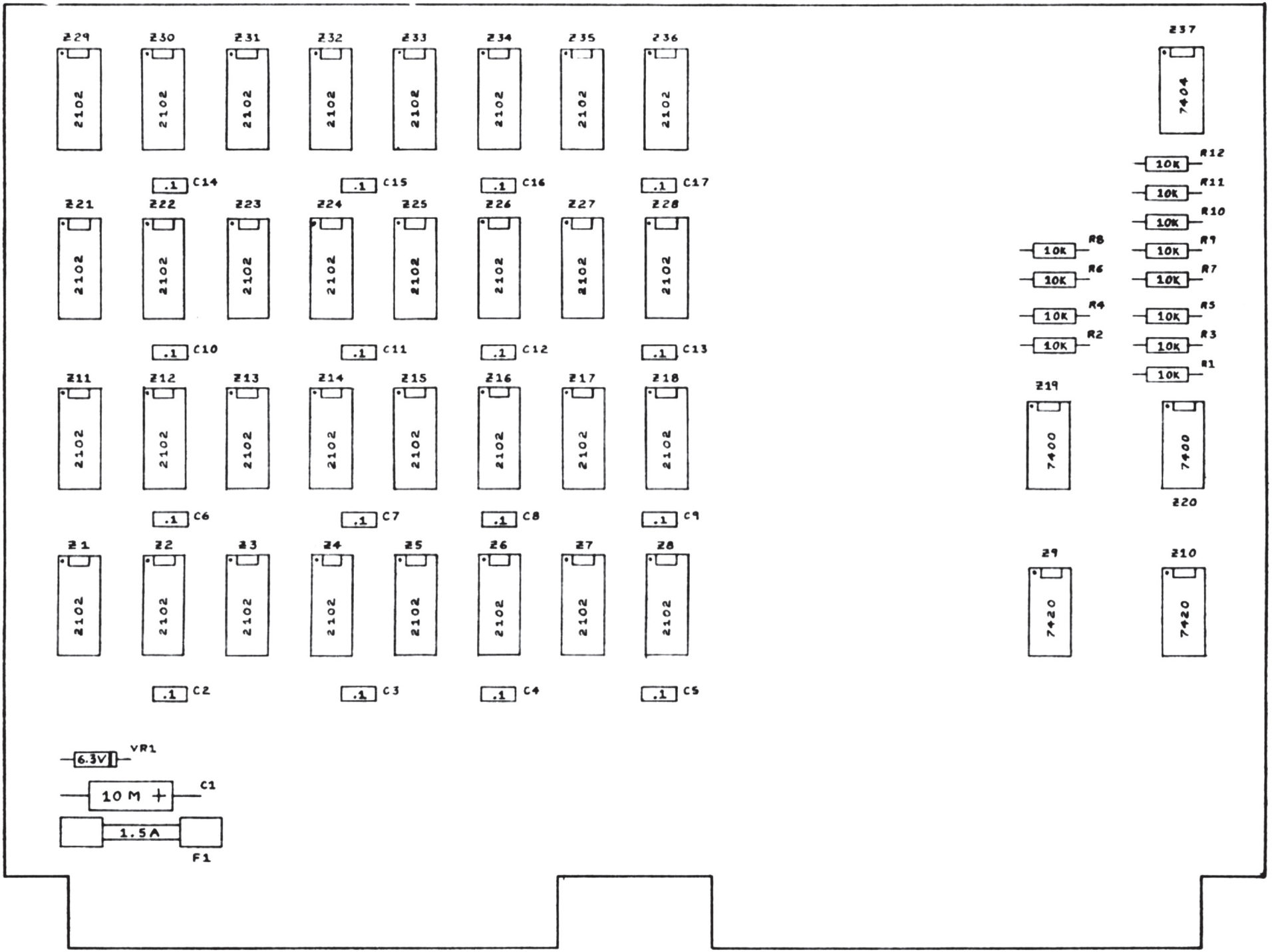
( ) Install eight type 2102 integrated circuits in the locations labeled on the drawing as Z11 - Z18. (This provides four pages of memory on the next higher order select lines for the card.)

( ) Install eight type 2102 integrated circuits in the locations labeled on the drawing as Z1 - Z8. (This provides four pages of memory on the four highest valued select lines for the card.)

( ) Install two type 7400 integrated circuits in the locations labeled on the assembly drawing as Z19 and Z20.

( ) Install two type 7420 integrated circuits in the locations labeled on the assembly drawing as, Z9 and Z10.

( ) Install a type 7404 integrated circuit in the location labeled on the assembly drawing as: Z37.


Z29
Z30
Z31
Z32
Z33
Z34
Z35
Z36
2102
.1 C14
.1 C15
.1 C16
.1 C17
Z21
Z22
Z23
Z24
Z25
Z26
Z27
Z28
.1 C10
.1 C11
.1 C12
.1 C13
Z11
Z12
Z13
Z14
Z15
Z16
Z17
Z18
.1 C6
.1 C7
.1 C8
.1 C9
Z1
Z2
Z3
Z4
Z5
Z6
Z7
Z8
.1 C2
.1 C3
.1 C4
.1 C5
6.3V VR1
10 M + C1
1.5A F1
Z37
7404
10K R12
10K R11
10K R10
10K R8
10K R9
10K R6
10K R7
10K R4
10K R5
10K R2
10K R3
10K R1
Z19
7400
7400
Z20
Z9
Z10
7420
7420

INSTALLATION OF RESISTORS

( ) Install twelve 10 K ohm (BRN-BLK-OR) 1/4 watt resistors at the locations shown on the assembly drawing for: R1 - R12.

INSTALLATION OF DIODES

( ) Install one 6.3 volt zener diode at the location shown for VR1. Be sure and observe correct polarity as indicated on the drawing.

INSTALLATION OF CAPACITORS

( ) Install one 10 MFD electrolytic capacitor in the position labeled on the drawing for C1. Be certain that the positive (+) end of the capacitor is oriented in the same direction as that shown on the drawing and indicated on the P.C. card.

( ) Install sixteen .1 UFD disk capacitors in the positions labeled on the drawing as: C2 - C17.

INSTALLATION OF FUSE CLIPS

( ) Install the two P.C. mounting fuse clips in the positions shown to hold fuse F1. Ensure that the clips line up so that a fuse will seat properly when installed.

INITIAL INSPECTION AND TESTING

( ) At this time carefully inspect both sides of the card to ascertain that there are no solder shorts between P.C. foil lands. Be especially observant on the component side of the card around the I.C. pins. Remove any solder shorts that are found.

( ) Install a 1.5 ampere type 8AG fuse in the fuse clips for F1.

( ) Use an ohm meter to make the following measurements.

Meter between pins A1 and A3 of the card connector - and then reverse the meter leads to obtain a second reading. The reading in both directions should be greater than five (5) ohms. (One reading will be typically several times higher than the other.) If the readings are less than five ohms look for solder shorts between the +5 volt supply lines and the common return lines on the card.

FINAL TESTING

Final testing of the card must be accomplished when the card is installed in a SCELBI-8B minicomputer chassis unit.

SCELBI COMPUTER CONSULTING, INC.

ASSEMBLY INSTRUCTIONS - SCELBI CARD #: 1109-

ROM/PROM MEMORY CARD

DESCRIPTION

The SCELBI #1109 ROM/PROM Memory card is an optional card. The card may be populated with up to 16 type 1602 or 1702 PROMS. At 256 words per ROM this allows up to 4,096 words of ROM memory to be stored on each card. The card may be plugged into any memory card slot in a SCELBI-8B system to substitute ROM/PROM memory for RAM memory.

KIT ASSEMBLY

You should refer to the assembly drawing shown on the next page during the assembly process. The drawing is to scale and shows the exact location of each part on the P.C. card.

INSTALLATION OF DIODES

( ) Install one 6.3 volt zener diode at the location shown for VR1. Be sure and observe correct polarity as indicated on the drawing.

( ) Install one 12.0 volt zener diode at the location shown for VR2. Be sure and observe correct polarity as indicated on the drawing.

INSTALLATION OF CAPACITORS

( ) Install one 10 MFD electrolytic capacitor in the position labeled on the drawing for C1. Be certain that the positive (+) end of the capacitor is oriented in the same direction as that shown on the drawing and indicated on the P.C. card.

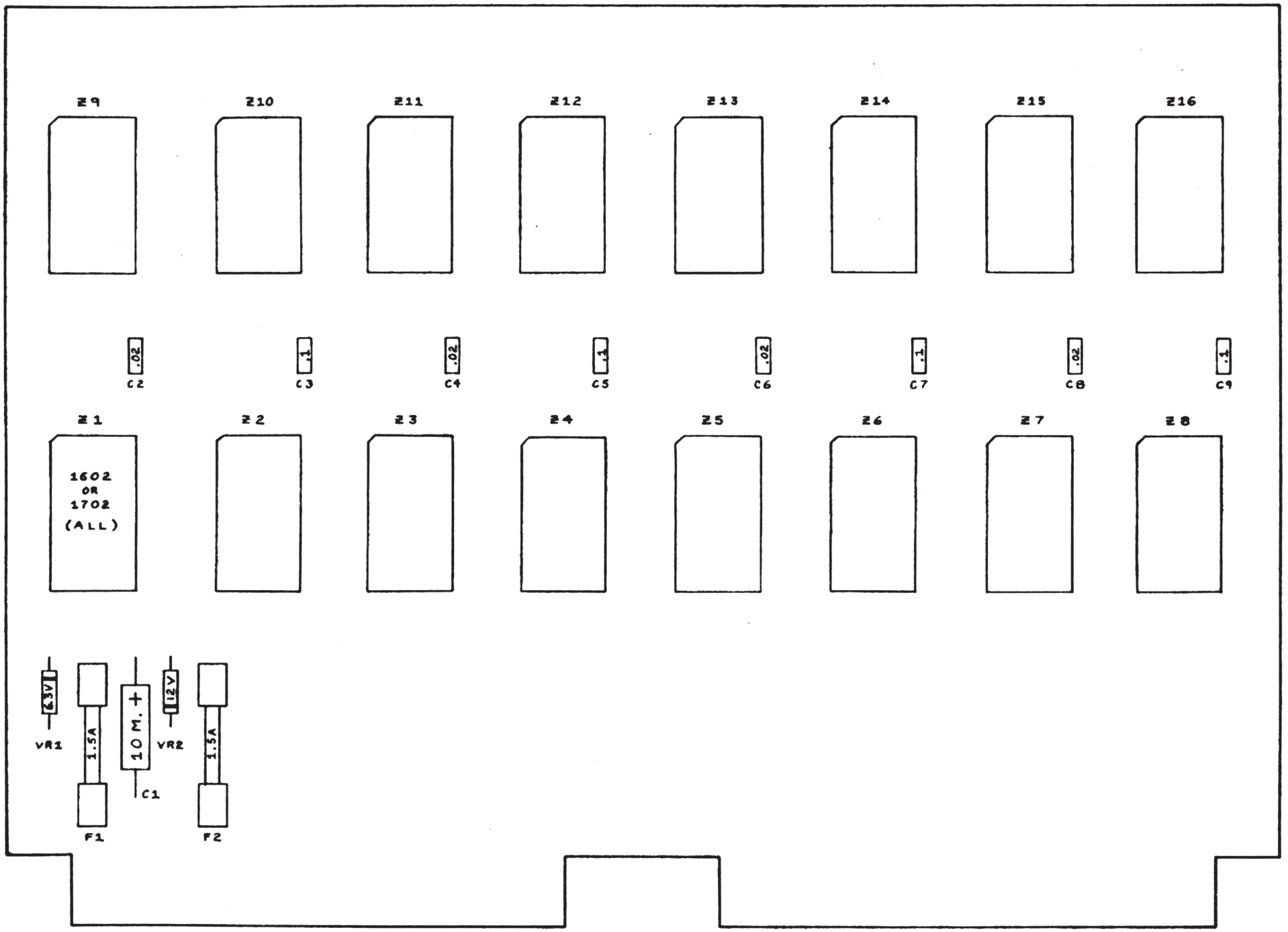
( ) Install four .1 UFD disk capacitors in the positions labeled on the drawing as: C3, C5, C7 AND C9.

( ) Install four .02 UFD disk capacitors in the positions labeled on the drawing as: C2, C4, C6 AND C8.

INSTALLATION OF FUSE CLIPS

( ) Install the four P.C. mounting fuse clips in the positions shown to hold fuses F1 and F2. Ensure that the clips line up so that a fuse will seat properly when installed.

( ) Install two 1.5 ampere type 8AG fuses in the fuse clips for F1 and F2.


Z9
Z10
Z11
Z12
Z13
Z14
Z15
Z16
.02
C2
.1
C3
.02
C4
.1
C5
.02
C6
.1
C7
.02
C8
.1
C9
Z1
1602
OR
1702
(ALL)
Z2
Z3
Z4
Z5
Z6
Z7
Z8
6.3V
VR1
1.5A
F1
10 M. +
C1
12V
VR2
1.5A
F2

INSTALLATION OF ROMS/PROMS

It is recommended that sockets be installed on the card and the ROMS or PROMS then installed in the sockets. The ROM/PROM positions on the card are designated as Z1 through Z16. Each ROM/PROM position corresponds to a "page" in memory - with Z1 being the position for the lowest "page" address on the card and Z16 being the position for the highest page address on the card. When a ROM/PROM is to be installed, select the correct position on the card for the "page" address in memory for which the program on the prom is designed to operate. Install a 24 pin integrated circuit socket on the card and solder the socket pins. Then install the ROM/PROM.

As an example, if it were desired to install a ROM with a program on it designed to operate when addressed as page 67 in a SCELBI-8B system, the ROM would be installed at location Z7 on the card. The card would then be installed in the last memory card slot (XA9) on a SCELBI-8B chassis unit.

INITIAL P.C. CARD TESTING

Experience has indicated that the majority of problems found with P.C. cards that have been assembled by the purchaser fall into several major categories.

1. Solder shorts between P.C. foil lands.
2. Components installed incorrectly or in the wrong location.
3. Occasionally a minor defect in a P.C. card - such as an open or shorted P.C. foil land will occur. SCELBI carefully inspects P.C. Cards but the final test of a P.C. cards foil integrity can only be made when the card is put into operation.
4. Very rarely a "feed-through" hole on a P.C. card will be found to be "open" in that the hole does not conduct from one side of the board to the other.
5. By far the most common fault found on cards where people have supplied their own parts is simply defective components.

Problems falling into categories 1, 2 and 3 can often be detected and eliminated by very careful visual inspection of the P.C. Board, both during the assembly process, and when the assembly has been completed. Solder shorts are easily removed with a hot soldering iron. Shorted P.C. foil lands can be separated by a sharp knife. An open P.C. foil land can be readily jumpered with a piece of wire and a bit of solder.

Improperly installed components should have their leads cut off and then the remaining piece of each lead sucked out of the hole with a "solder sucker" instrument. Do not try to remove whole components in order to "save" the component as to attempt to do so will often result in permanent destruction to the P.C. foil on the card. The P.C. cards have "plated-through" holes for component leads - these holes become filled with solder when the component is initially soldered to the board and it is extremely difficult to try to remove a group of leads such as those on an integrated circuit, at one time, without also causing damage to the P.C. card.

The 4th category listed above is not readily detected by visual inspection. This problem is rare in SCELBI P.C. cards but it can occur. The detection is generally easy once a problem has been localized to a particular circuit in that a driving signal present at an output device will not be present at the input device, it is supposed to drive. An ohm meter check will verify an open feed through. An open feed through hole can be fixed by inserting a piece of wire through the hole and soldering it in place.

Locating faulty components generally requires some technical skill such as the ability to follow the logic detailed in the schematics which are included in the technical section at the end of this chapter. An oscilloscope or other suitable logic indicating probe is generally required. User's who appear to have faulty components should take appropriate steps to locate the faulty component by referring to the technical section. (Those that do not have the necessary skills and/or equipment may return iheir units for testing/repair. Such services are free if the customer's warrantee applies. A modest service charge applies in all other cases. Be sure to obtain a return authorization from the factory if it is necessary to return a unit!)

INTRODUCTION

This section provides assembly and installation instructions for the chassis portion of the SCELBI-8B minicomputer. It consist of three main sections.

1. SCELBI-8B card socket inter-connection wiring.

2. Wiring to input/output connectors.

3. SCELBI-8B card set installation and check out.

Customers who purchased completely assembled and tested SCELBI-8B mini-computers may proceed directly to the third part of this section. Sections 1 and 2 serve as references for those customers as the information detailed therein has been performed at the factory.

Customers who purchased SCELBI-8B chassis kits should start at section two. The wiring discussed in section 1 is contained on the SCELBI-8B backplane harness board and/or was completed at the factory.

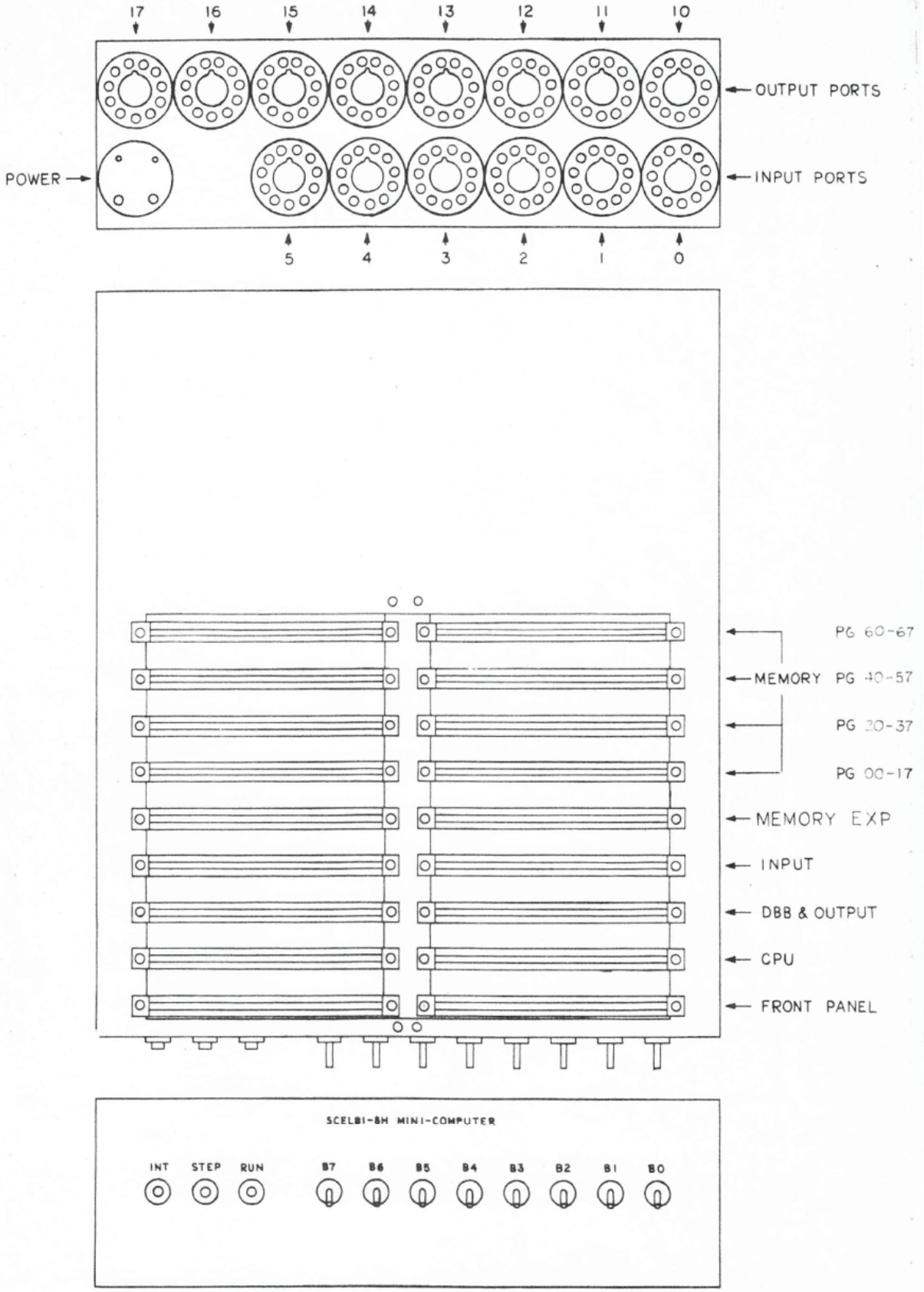
Customers who purchased just a SCELBI-8B card set and who are providing their own chassis and card mounting hardware should start with section one.

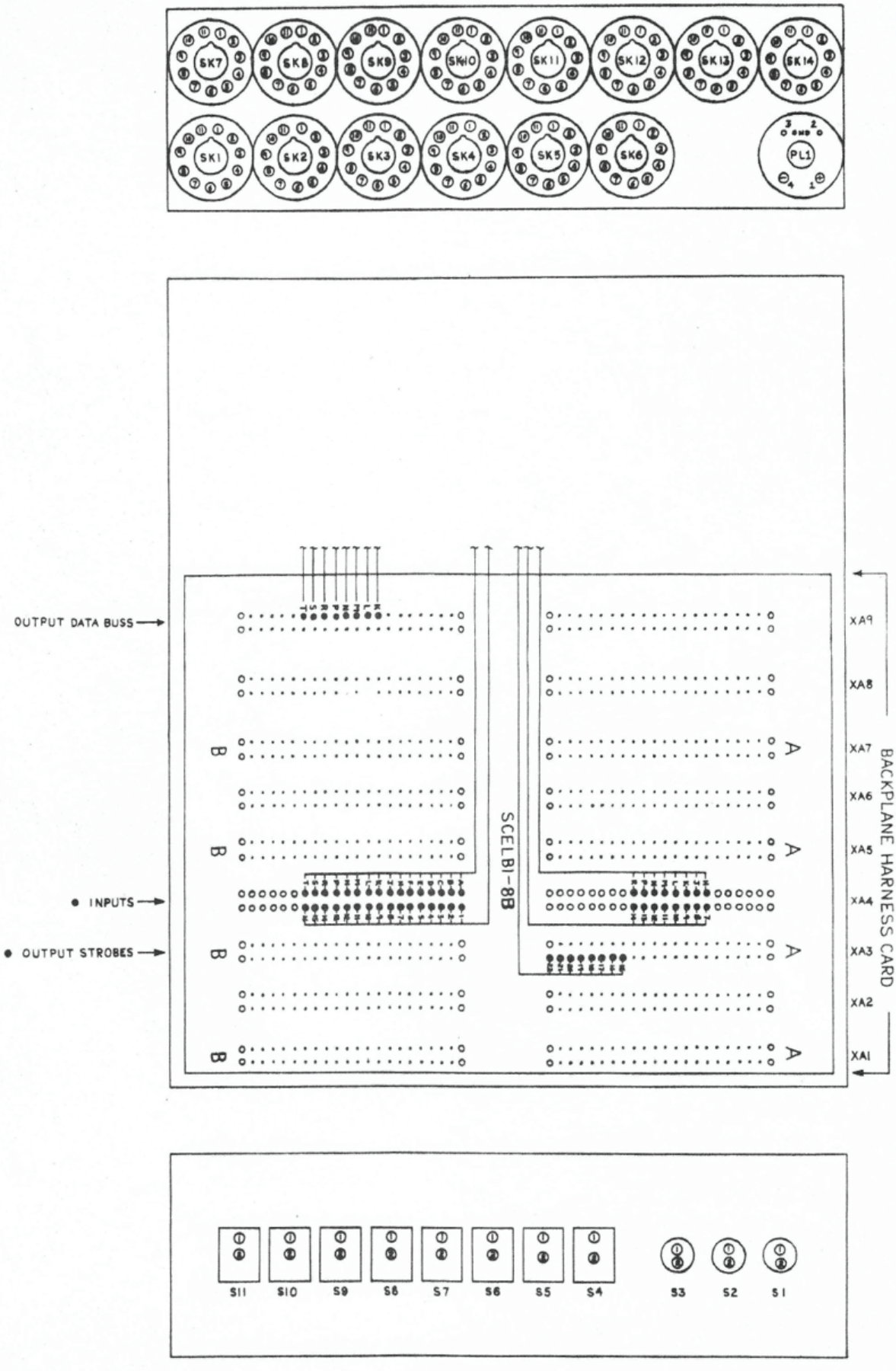
SECTION I

Customers who purchase just the basic card set for the SCELBI-8B minicomputer have to provide their own chassis. Card connectors. I/O connectors and chassis console switches. They must then inter-connect these components to provide their operating computer. Since individual tastes will dictate the type of mechanical configuration for such systems, the following information will be devoted to the wiring required to connect the SCELBI-8B cards into an operating computer. As an aid to presenting the information, it will be assumed that the cards are to be arranged in the same order as they appear on a standard factory assembled SCELBI-8B.

The reader should refer to the chassis drawings presented on the next two pages. One, showing a top view of a SCELBI-8B minicomputer, illustrates the order in which cards are arranged. The second presents a bottom view of a chassis to illustrate connection points from card sockets to I/O connectors and switches. If a builder desires to approximate a SCELBI-8B chassis unit the following information will be usefull. A 10 x 12 x 3 inch aluminum chassis can serve as a base unit. Pairs of 44 pin card connectors, such as amphenol #22221-404 units, can be laid out along the top of the chassis in pairs to accept the card edge fingers on the SCELBI-8B P.C. cards. The distance between pairs of card sockets should be 3/4 inch or more to provide sufficient room for proper air flow and heat dissipation between cards.

For wiring purposes, card sockets when arranged as illustrated in the pre-


17
16
15
14
13
12
11
10
OUTPUT PORTS
POWER
INPUT PORTS
5
4
3
2
1
0
PG 60-67
MEMORY PG 40-57
PG 20-37
PG 00-17
MEMORY EXP
INPUT
DBB & OUTPUT
CPU
FRONT PANEL
SCELBI-8H MINI-COMPUTER
INT
STEP
RUN
B7
B6
B5
B4
B3
B2
B1
B0


SK7
SK8
SK9
SK10
SK11
SK12
SK13
SK14
SK1
SK2
SK3
SK4
SK5
SK6
PL1
OUTPUT DATA BUSS
INPUTS
OUTPUT STROBES
SCELBI-8B
XA9
XA8
XA7
XA6
XA5
XA4
XA3
XA2
XA1
BACKPLANE HARNESS CARD
S11
S10
S9
S8
S7
S6
S5
S4
S3
S2
S1

vious drawings have been given the following reference designations. First, card slots from front to back, are refered to by "XA" number. The front most slot is XA01. And in a standard system, the last slot is designated XA09. Since each slot contains two card sockets, the left most socket (when viewed from the front of the unit) is termed the "A" socket and the right one designated the "B" socket. Finally. The pins on each socket are designated as follows. The row of 22 pins that are towards the front of the unit are designated from left to right (again, as viewed from the front) as pins numbers 1 through 22. The other row of 22 pins are referred to by alphabetical designations using the letters A through Z with the letters G, I, O, and Q omitted. It is important to ensure that the unit being constructed follows these reference designations so that the unit is wired properly. All references in this section relate to the above labeling convention.

I/O sockets, and the power plug may be mounted along the rear of the chassis unit as illustrated. The standard SCELBI-8B I/O connector is an 11 pin amphenol type 78s11 socket mounted with the "key" pointing towards the bottom of the chassis. Standard SCELBI peripheral cables mate with this type of socket. If you desire to use another type of I/O connector you will have to prepare your own I/O cables and you will have to arrange your own pin assignments and appropriately alter the I/O wiring designations provided in the next section.

The power plug on a standard SCELBI unit is an amphenol type 86cp4 or equivalent. This is a four pin "keyed" male plug used for bringing in operating power to the computer card set as shown in the drawings.

There are eleven switches necessary for operating the SCELBI-8B mini-computer. Eight of these are SPST toggle switches used for inputting data and instructions to the computer when operating in the manual mode. If the SCELBI-8B format is being followed. Use miniature or sub-miniature switches. The chassis drawings show the recommended lay-out along with the reference designations assigned to the control switches. Three other switches for providing the "interrupt," "step," and "run" functions are required. These switches are standard "normally open" push button or momentary toggle devices.

CARD SOCKET INTERCONNECT WIRING

Once the card sockets have been mounted in the chassis or other fixture, one may proceed to do the interconnect wiring between the computer card sockets. The wiring information that follows was generated by computer and contains wiring information for a system that may contain up to 16,384 Words of memory (on 4 SCELBI type 1107 or 1109 memory element cards). Before starting the wiring, the assembler should ensure that the reference designations discussed above are understood.

SCELBI recommends the use of 24 to 38 gange solid insulated wire for interconnecting the card sockets. Care should be taken to prevent shorts to adjacent pins as wires are installed.

The wire list that follows for the card socket interconnect wiring is quite easy to understand. Each connection point for a "wire run" is listed. "Wire runs" are grouped by signal nomenclature and separated by a solid line. Since connection points are listed, the actual number of wires in a wire rum is n - 1 where "n" is the number of connection points. For example. A wire run shown as:

```
XA01 B01 D0K
XA03 B-A D0H
```

Indicates that a single wire is to be run from slot XA01 (front most card slot) pin B01 (right socket when viewed from the front & first pin on the front most part of the socket) over to the third slot (XA03) on the right socket pin "A" (B-A). (As viewed from the top of the unit!) The last reference in a line for a connection point is the signal nomenclature for that wire run. Signal nomenclatures are derived from the schematics for the various SCELBI-8B cards. Multi-wire runs may not show the connection points in the best routing sequence so the assembler should review each wire run and pick the best routing sequence to use the least amount of wire. Make a check mark as you complete each connection beside the appropriate entry on the wire list as an aid to maintaining youn place as you work.

SCELBI-8B P.C. SOCKET WIRING

```
XA01  B01   D0H
XA03  B-A   D0H
XA05  B-L   D0H
--------------
XA01  B09   D0L
XA03  B-K   D0L
--------------
XA02  A07   D0N
XA03  A-H   D0N
--------------
XA01  B02   D1H
XA03  B-B   D1H
XA04  B-V   D1H
XA05  B-M   D1H
--------------
XA01  B10   D1L
XA03  B-L   D1L
--------------
XA02  A08   D1N
XA03  A-J   D1N
--------------
XA01  B03   D2H
XA03  B-C   D2H
XA04  B-W   D2H
XA05  B-N   D2H
--------------
XA01  Bl1   D2L
XA03  B-M   D2L
--------------
XA02  A09   D2N
XA03  A-K   D2N
--------------
XA01  B04   D3H
XA03  B-D   D3H
XA04  B-X   D3H
XA05  B-P   D3H
--------------
XA01  B12   D3L
XA03  B-N   D3L
--------------
```

SCELBI-8B P.C. SOCKET WIRING

```
XA02  A10   D3N
XA03  A-L   D3N
--------------
XA01  B05   D4H
XA02  B05   D4H
XA03  B-F   D4H
YA05  B-P   D4H
--------------
XA01  B13   D4L
XA03  B-P   D4L
--------------
YA02  All   D4N
XA03  A-M   D4N
--------------
XA01  B06   D5H
XA02  B06   D5H
XA03  B-F   D5H
XA05  B-S   D5H
--------------
XA01  B14   D5L
XA03  B-R   D5L
--------------
XA02  B12   D5N
XA03  A-N   D5N
--------------
XA01  B07   D6H
XA02  B07   D6H
XA03  B-H   D6H
XA04  B-Y   D6H
--------------
XA01  B15   D6L
XA03  B-S   D6L
--------------
XA02  A13   D6N
XA03  A-P   D6N
--------------
XA01  B08   D7H
XA02  B08   D7H
XA03  B-J   D7H
XA04  B-Z   D7H
--------------
XA01  B16   D7L
XA03  B-T   D7L
--------------
XA02  A14   D7N
YA03  A-R   D7N
--------------
XA02  Bl9   HAS
XA03  B-W   HAS
--------------
XA01  A13   INT
XA02  A-T   INT
--------------
XA02  B17   LAS
XA03  B-U   LAS
--------------
XA02  A15   MD0N
XA04  A-S   MD0N
--------------
```

SCELBI-8B P.C. SOCKET WIRING

```
XA02  A16   MD1N
XA04  A-T   MD1N
-----~----------
XA02  A17   MD2N
XA04  A-U   MD2N
---------------
XA02  Al8   MD3N
XA04  A-V   MD3N
---------------
XA02  A19   MD4N
XA04  A-W   MD4N
---------------
XA02  A20   MD5N
XA04  A-X   MD5N
---------------
XA02  A2l   MD6N
XA04  A-Y   MD6N
---------------
XA02  A22   MD7N
XA04  A-Z   MD7N
---------------
XA01  A15   MIN0
XA04  A15   MIN0
---------------
XA01  A16   MIN1
XA04  A16   MIN1
---------------
XA01  A17   MIN2
XA04  A17   MIN2
---------------
XA01  A18   MIN3
XA04  A18   MIN3
---------------
XA01  A19   MIN4
XA04  A19   MIN4
---------------
XA01  A20   MIN5
XA04  A20   MIN5
---------------
XA01  A21   MIN6
XA04  A21   MIN6
---------------
XA01  A22   MIN7
XA04  A22   MIN7
---------------
XA02  B15   OPSN
XA03  B-U   OPSN
---------------
XA02  B12   PCN
XA03  B17   PCN
---------------
XA01  B-L   STOPN
XA02  B-L   STOPN
-----------------
XA02  A-U   S0
XA04  B-U   S0
--------------
```

SCELBI-8B P.C. SOCKET WIRING

XA01	B-J	TIN
XA02	B-J	TlN
XA01	B-F	T3N
XA02	B-F	T3N
XA03	A07	D0B
XA06	A-H	D0B
XA07	A-H	D0B
XA08	A-H	D0B
XA09	A-H	D0B
XA03	B-K	D0L
XA06	B-K	D0L
XA07	B-K	D0L
XA08	B-K	D0L
XA09	B-K	D0L
XA03	A08	D1B
XA06	A-J	D1B
XA07	A-J	D1B
XA08	A-J	D1B
XA09	A-J	D1B
XA03	B-L	D1L
XA06	B-L	DIL
XA07	B-L	D1L
XA08	B-L	D1L
XA09	B-L	D1L
XA03	A09	D2B
XA06	A-K	D2B
XA07	A-K	D2B
XA08	A-K	D2B
XA09	A-K	D2B
XA03	B-M	D2L
XA06	B-M	D2L
XA07	B-M	D2L
XA08	B-M	D2L
XA09	B-M	D2L
XA03	A10	D3B
XA06	A-L	D3B
XA07	A-L	D3B
XA08	A-L	D3B
XA09	A-L	D3B
XA03	B-N	D3L
XA06	B-N	D3L
XA07	B-N	D3L
XA08	B-N	D3L
XA09	B-N	D3L

SCELBI-8B P.C. SOCKET WIRING

```
XA03  A11   D4B
XA06  A-M   D4B
XA07  A-M   D4B
XA08  A-M   D4B
XA09  A-M   D4B
---------------
XA03  B-P   D4L
XA06  B-P   D4L
XA07  B-P   D4L
XA08  B-P   D4L
XA09  B-P   D4L
---------------
XA03  A12   D5B
XA06  A-N   D5B
XA07  A-N   D5B
XA08  A-N   D5B
XA09  A-N   D5B
---------------
XA03  B-R   D5L
XA06  B-R   D5L
XA07  B-R   DSL
XA08  B-R   D5L
XA09  B-R   D5L
---------------
XA03  A13   D6B
XA06  A-P   D6B
XA07  A-P   D6B
XA08  A-P   D6B
XA09  A-P   D6B
---------------
XA03  B-S   D6L
XA06  B-S   D6L
XA07  B-S   D6L
XA08  B-S   D6L
XA09  B-S   D6L
---------------
XA03  A14   D7B
XA06  A-R   D7B
XA07  A-R   D7B
XA08  A-R   D7B
XA09  A-R   D7B
---------------
XA03  B-T   D7L
XA06  B-T   D7L
XA07  B-T   D7L
XA08  B-T   D7L
XA09  B-T   D7L
---------------
XA04  A15   MIN0
XA06  A-S   MIN0
XA07  A-S   MIM0
XA08  A-S   MIN0
XA09  A-S   MIN0
----------------
```

SCELBI-8B P.C. SOCKET WIRING

```
XA04  A16   MIN1
XA06  A-T   MIN1
XA07  A-T   MIN1
XA08  A-T   MIN1
XA09  A-T   MIN1
----------------
XA04  AI7   MIN2
XA06  A-U   MIN2
XA07  A-U   MIN2
XA08  A-U   MIN2
XA09  A-U   MIN2
----------------
XA04  Al8   MIN3
XA06  A-V   MIN3
XA07  A-V   MIN3
XA08  A-V   MIN3
XA09  A-V   MIN3
----------------
XA04  A19   MIN4
XA06  A-W   MIN4
XA07  A-W   MIN4
XA08  A-W   MIN4
XA09  A-W   MIN4
----------------
XA04  A20   MIN5
XA06  A-X   MIN5
XA07  A-X   MIN5
XA08  A-X   MIN5
XA09  A-X   MIN5
----------------
XA04  A21   MIN6
XA06  A-Y   MIN6
XA07  A-Y   MIN6
XA08  A-Y   MIN6
XA09  A-Y   MIN6
----------------
XA04  A22   MIN7
XA06  A-Z   MIN7
XA07  A-Z   MIN7
XA08  A-Z   MIN7
XA09  A-Z   MIN7
----------------
XA02  B-Z   WRITE
XA06  B-Z   WRITE
XA07  B-Z   WRITE
XA08  B-Z   WRITE
XA09  B-Z   WRITE
-----------------
XA05  B-1   M0NXl
XA06  B-1   M0NXl
-----------------
XA05  B-2   M1NXl
XA06  B-2   M1NX1
-----------------
XA05  B-3   M2NX1
XA06  B-3   M2NX1
-----------------
```

SCELBI-8B P.C. SOCKET WIRING

```
XA05  B-4   M3NX1
XA06  B-4   M3NX1
----------------
XA05  B-5   M4NX1
XA06  B-5   M4NX1
----------------
XA05  B-6   M5NX1
XA06  B-6   M5NX1
----------------
XA05  B-7   M6NX1
XA06  B-7   M6NX1
----------------
XA05  B-8   M7NX1
XA06  B-8   M7NX1
----------------
XA05  B-9   M10NX1
XA06  B-9   M10NX1
----------------
XA05  B10   M11NX1
XA06  B10   M11NX1
----------------
XA05  B11   M12NX1
XA06  B11   M12NX1
----------------
XA05  B12   M13NX1
XA06  B12   M13NX1
----------------
XA05  B13   M14NX1
XA06  B13   M14NX1
----------------
XA05  B14   M15NX1
XA06  B14   MI5NX1
----------------
XA05  B15   M16NX1
XA06  B15   M16NX1
----------------
XA05  B16   M17NX1
XA06  B16   M17NX1
----------------
XA05  B-A   M0NX2
XA07  B-1   M0NX2
----------------
XA05  B-B   M1NX2
XA07  B-2   M1NX2
----------------
XA05  B-C   M2NX2
XA07  B-3   M2NX2
----------------
XA05  B-D   M3NX2
XA07  B-4   M3NX2
----------------
XA05  B-E   M4NX2
XA07  B-5   M4NX2
----------------
XA05  B-F   M5NX2
XA07  B-6   M5NX2
----------------
```

SCELBI-8B P.C. SOCKET WIRING

```
XA05  B-H   M6NX2
XA07  B-7   M6NX2
----------------
XA05  B-J   M7NX2
XA07  B-8   M7NX2
----------------
XA05  B-U   M10NX2
XA07  B-9   M10NX2
----------------
XA05  B17   M11NX2
XA07  B10   M11NX2
----------------
XA05  B-V   M12NX2
XA07  B11   M12NX2
----------------
XA05  B18   M13NX2
XA07  B12   M13NX2
----------------
XA05  B-W   M14NX2
XA07  B13   M14NX2
----------------
XA05  B19   M15NX2
XA07  B14   M15NX2
----------------
XA05  B-X   M16NX2
XA07  B15   M16NX2
----------------
XA05  B20   M17NX2
XA07  B16   M17NX2
----------------
XA05  A-S   M0NX3
XA08  B-1   M0NX3
----------------
XA05  A-T   M1NX3
XA08  B-2   M1NX3
----------------
XA05  A-U   M2NX3
XA08  B-3   M2NX3
----------------
XA05  A-V   M3NX3
XA08  B-4   M3NX3
----------------
XA05  A-W   M4NX3
XA08  B-5   M4NX3
----------------
XA05  A-X   M5NX3
XA08  B-6   M5NX3
----------------
XA05  A-Y   M6NX3
XA08  B-7   M6NX3
----------------
XA05  A-Z   M7NX3
XA08  B-8   M7NX3
----------------
XA05  A22   M10NX3
XA08  B-9   M10NX3
----------------
```

SCELBI-8B P.C. SOCKET WIRING

```
XA05  A21   M1INX3
XA08  B10   M11NX3
------------------
XA05  A20   M12NX3
XA08  B11   M12NX3
------------------
XA05  A19   M13NX3
XA08  B12   M13NX3
~-----------------
XA05  Al8   M14NX3
XA08  B13   M14NX3
------------------
XA05  A17   M15NX3
XA08  B14   M15Nx3
------------------
XA05  A16   M16NX3
XA08  B15   Ml6NX3
------------------
XA05  Al5   Ml7NX3
XA08  B16   M17NX3
------------------
XA05  A-H   M0NX4
XA09  B-1   M0NX4
-----------------
XA05  A-7   MlNX4
XA09  B-2   MINX4
-----------------
XA05  A-J   M2NX4
XA09  B-3   M2NX4
-----------------
XA05  A-8   M3NX4
XA09  B-4   M3NX4
------------------
XA05  A-K   M4NX4
XA09  B-5   M4NX4
-----------------
XA05  A-9   M5NX4
XA09  B-6   M5NX4
------------------
XA05  A-L   M6NX4
XA09  B-7   M6NX4
-----------------
XA05  Al0   M7NX4
XA09  B-8   M7MX4
-----------------
XA05  A-M   M10NX4
XA09  B-9   M10NX4
------------------
XA05  All   M11NX4
XA09  B10   Ml1NX4
------------------
XA05  A-N   M12NX4
XA09  B11   M12NX4
------------------
XA05  A12   M13NX4
XA09  B12   M13NX4
------------------
```

SCELBI-8B P.C. SOCKET WIRING

```
XA05  A-P   M14NX4
XA09  B13   M14MX4
------------------
XA05  A13   M15NX4
XA09  B14   M15NX4
------------------
XA05  A-R   M16NX4
XA09  B15   Ml6NX4
------------------
XA05  A14   M17NX4
XA09  B16   M17NX4
------------------
```

SECTION II

ASSEMBLY OF SCELBI-8B CHASSIS/FRONT PANEL UNIT

Customers who purchased the SCELBI-8B chassis kit will receive a pre-punched chassis with the SCELBI #1108 backplane harness board and card sockets installed. To complete the unit proceed as follows. (If you are providing your own chassis unit, you should proceed to the next page to continue completing the chassis wiring.)

1.) Mount the 14 (11 pin) I/O connectors at the rear of the chassis in the holes provided for the "INP" and "OUT" connectors. Use the retainer clip rings provided to fasten the connectors to the unit. Position the sockets so that the slot (key) is pointing towards the bottom of the chassis. (Refer to the chassis drawings at the beginning of section I, if necessary.)

2.) Install the male (4 pin) power connector at the rear of the chassis using a retainer clip ring. The two larger pins on the plug should be towards the top of the chassis.

3.) Install the card guides on the card sockets as per the illustration included with the guides. Mount one guide on the outer end of each "pair" of card sockets.

4.) Mount the front panel unit to the chassis using the 8 chassis toggle switches. Install several switches to hold the panel in place and make sure all the holes line up before tightening the switch nuts.

IMPORTANT

Make sure the toggle switches are rotated so that the slot in the switch shaft is pointing upwards! Addittonally, be extremely careful when tightening panel nuts not to mar or scratch the finish on the front panel.

When the toggle switches have been installed you may slide a color coding sleeve on each switch lever. Green on switches B7 & B6. Yellow on B5 through B3. And red on B2 to B0.

5.) Install the 3 push button switches on the left hand side of the unit. Be careful when tightening the nuts not to damage the front panel finish.

You have now completed the mechanical assembly of the SCELBI-8B chassis kit. You should proceed to perform the chassis wiring by going on to the next page.

SCELSI-8B CHASSIS POWER BUSS WIRING

The following wire runs denote the power connections in a SCELBI-8B system. If you are providing your own chassis unit and card sockets. You should provide all the connections listed. If you purchased the SCELBI-8B chassis kit, then you only have to connect the wires designated by a double asterisk (**) as the remaining connections shown in the list are included on the SCELBI #1108 backplane harness board. You may refer to the drawings shown at the beginning of section I for the location and pin numbers of the pover connector located at the rear of the chassis. Persons providing their own chassis and power connector should make appropriate connections from the power connector to the card socket pins using the following list as a guideline for connections to the card sockets.

```
XA01  A-A   +5V BUSS
XA01  A0l   +5V BUSS
XA02  A-A   +5V BUSS
XA02  A0l   +SV BUSS
XA03  A-A   +SV BUSS
XA03  A0l   +SV BUSS
XA04  A-A   +5V BUSS
XA04  A0l   +5V BUSS
XA0S  A-A   +SV BUSS
XA05  A0l   +SV BUSS
XA06  A-A   +5V BUSS
XA06  A0l   +SV BUSS
XA07  A-A   +5V BUSS
XA07  A0l   +5V BUSS
XA08  A-A   +5V BUSS
XA08  A01   +5V BUSS
XA09  A-A   +5V BUSS **
XA09  A0l   +5V BUSS **
P00l  001   +5V BUSS **
------------------
XA01  A-C   COM/GND
XA01  A03   COM/GND
XA02  A-C   COM/GND
XA02  A03   COM/GND
XA03  A-C   COM/GND
XA03  A03   COM/GND
XA04  A-C   COM/GND
XA04  A03   COM/GND
XA05  A-C   COM/GND
XA05  A03   COM/GND
XA06  A-C   COM/GND
XA06  A03   COM/GND
XA07  A-C   COM/GND
XA07  A03   COM/GND
XA08  A-C   COM/GND
XA08  A03   COM/GND
XA09  A-C   COM/GND **
XA09  A03   COM/GND **
P00l  002   COM/GND **
P00l  003   COM/GND **
SK06  011   COM/GND **
------------------
```

```
XA01  A-E   -9V BUSS
XA01  A05   -9V BUSS
XA02  A-E   -9V BUSS
XA02  A05   -9V BUSS
XA06  A-E   -9V BUSS
XA06  A05   -9V BUSS
XA07  A-E   -9V BUSS
XA07  A05   -9V BUSS
XA08  A-E   -9V BUSS
XA08  A05   -9V BUSS
XA09  A-E   -9V BUSS ••
XA09  A05   -9V BUSS ••
P001  004   -9V BUSS ••
```

WIRING TO FRONT PANEL CONTROL SWITCHES

Refer to the bottom view drawing of the SCELBI-8B chassis near the start of section I for the positions of chassis switches and the terminal designations on the switches. Install the wires listed below from the designated P.C. Card socket pairs to the control switches.

Additionally. Install the jumper wires at slot XA02 as shown in the list below.

```
XA02  A-J   INT NC      (GND)
XA02  A-C   INT NC      (GND)
~---------------------------
XA02  A-H   INT NO
S1    TP2   INT NO
------------------
XA04  A-F   INT0
S11   TP2   INT0
---------------
XA04  A06   INT1
Sl0   TP2   INT1
---------------
XA04  B17   INT2
S9    TP2   INT2
---------------
XA04  BI8   INT3
S8    TP2   INT3
---------------
XA04  B19   INT4
57    TP2   INT4
---------------
XA04  B20   INT5
S6    TP2   INT5
---------------
XA84  B21   INT6
S5    TP2   INT6
---------------
XA84  B22   INT7
S4    TP2   INT7
---------------
XA02  A-X   RDYN
XA02  A-Z   RDYN
---------------
XA02  A-Y   T3N
XA02  B-F   T3N
---------------
XA02  A-L   RUN
S3    TP2   RUN
---------------
XA02  A-N   STEP
S2    TP2   STEP
---------------
XA02  B-A   SYNC
XA02  B-B   SYNC
---------------
XA02  A-R   INT OP      (GND)
XA02  A-C   INT OP      (GND)
----------------------------
```

XA02	B-T	T1IN
XA02	B-U	T1IN
S1	TP1	COM/GND
S2	TP1	COM/GND
S3	TP1	COM/GND
S4	TP1	COM/GND
S5	TP1	COM/GND
S6	TP1	COM/aND
S7	TP1	COM/GND
S8	TP1	COM/GND
S9	TP1	COM/GND
S10	TP1	COM/GND
S11	TP1	COM/GND
XA01	A03	COM/GND

SCELBI-8B INPUT/OUTPUT WIRING

Before installing the wires from the P.C. card sockets to the I/O (input/output) connectors, you should have completed the basic P.C. card socket wiring as described in the previous pages. Now, the only wiring required to complete the SCELBI-8B is the wiring to the I/O connectors. The wiring of these connectors is detailed in the following pages.

It should be noted that if you have the SCELBI-8B basic card set, consisting of a #1100 cpu card, a #1101 DBB and Output card, a #1102 Input card, a #1106 Memory Expansion card, a #1104 Front Panel card, and one or more #1107 Ram memory cards, that you can plug those cards into the P.C. card sockets that you have completed the wiring on, provide power to the unit, and have an operational SCELBI-8B minicomputer at this point (without any I/O capability)! If you desire to operate your SCELBI-8B unit prior to installing the I/O wiring refer to section III which describes the procedures to follow for initial installation and check out of the SCELBI-8B card set.

The drawings shown at the beginning of section I should be referred to when doing the following wiring. Those drawings show the positions of the I/O connectors at the rear of the chassis unit along with the socket and socket pin designations. The wiring list that follows will tell you where to connect wires between I/O connectors and between the I/O comwectors and pins on the P.C. Card sockets, so that your SCELBI-8B will be able to be easily connected to external (I/O) devices.

As wires are run from the I/O connectors to the printed circuit connectors you should form a bundle up the middle of the chassis that can eventually be tied with cable ties. It is often helpful to use pieces of masking tape to keep the wires in order until the wiring has been completed. The wires should be branched off to the printed circuit connecters as illustrated in the drawing.

INTER-I/O CONNECTOR WIRING

Use 2 1/2 inch pieces of wire stripped 1/4 inch at each end and install the following wires to form a “buss” system on the I/O connectors at the back of the chassis.

	FROM	TO	REF DESIG
( )	SK6 PIN 11	SK12 PIN 11	SIG GND
( )	SK6 PIN 11 (3S)	SK5 PIN 11	SIG GND
( )	SK5 PIN 11 (2S)	SK4 PIN 11	SIG GND
( )	SK4 PIN 11 (2S)	SK3 PIN 11	SIG GND
( )	SK3 PIN 11 (2S)	SK2 PIN 11	SIG GND
( )	SK2 PIN 11 (2S)	SK1 PIN 11 (1S)	SIG GND
( )	SK12 PIN 11	SK13 PIN 11	SIG GND
( )	SKI3 PIN 11 (2S)	SK14 PIN 11 (1S)	SIG GND
( )	SK12 PIN 11 (3S)	SK11 PIN 11	SIG GND

INTRA-I/O CONNECTOR WIRING

	FROM	TO	REF DESIG
( )	SK11 PIN 11 (2S)	SK10 PIN 11	SIG GND
( )	SK10 PIN 11 (2S)	SK9 PIN 1I	SIG GND
( )	SK9 PIN 11 (2S)	SK8 PIN 11	SIG GND
( )	SK8 PIN 11 (2S)	SK7 PIN 11 (15)	SIG GND
( )	SK7 PIN 1 (15)	SK8 PIN 1	D0L
( )	SK8 PIN 1 (25)	SK9 PIN. 1	D0L
( )	SK9 PIN 1 (25)	SKl0 PIN 1	D0L
( )	SK10 PIN 1	SKll PIN 1	D0L
( )	SK11 PIN 1 (25)	SKI2 PIN 1	D0L
( )	SK12 PIN I (25)	SK13 PIN 1	D0L
( )	SK13 PIN I (25)	SK14 PIN 1 (15)	D0L
( )	SK7 PIN 2 (15)	SK8 PIN 2	D1L
( )	SK8 PIN 2 (25)	SK9 PIN 2	D1L
( )	SK9 PIN 2 (2S)	SK10 PIN 2	D1L
( )	SK10 PIN 2	SK11 PIN 2	D1L
( )	SK11 PIN 2 (2S)	SK12 PIN 2	D1L
( )	SK12 PIN 2 (2S)	SK13 PIN 2	D1L
( )	SK13 PIN 2 (2S)	SK14 PIN 2 (15)	D1L
( )	SK7 PIN 3 (IS)	SK8 PIN 3	D2L
( )	SK8 PIN 3 (25)	SK9 PIN 3	D2L
( )	SK9 PIN 3 (2S)	SK10 PIN 3	D2L
( )	SKl0 PIN 3	SK11 PIN 3	D2L
( )	SKll PIN 3 (25)	SK12 PIN 3	D2L
( )	SK12 PIN 3 (2S)	SK13 PIN 3	D2L
( )	SK13 PIN 3 (2S)	SK14 PIN 3 (15)	D2L
( )	SK7 PIN 4 (IS)	SK8 PIN 4	D3L
( )	SK8 PIN 4 (2S)	SK9 PIN 4	D3L
( )	SK9 PIN 4 (2S)	SK10 PIN 4	D3L

INTRA-I/O CONNECTOR WIRING

	FROM	TO	REF DESIG
( )	SK10 PIN 4	SK11 PIN 4	D3L
( )	SKII PIN 4 (2S)	SK12 PIN 4	D3L
( )	SK12 PIN 4 (2S)	SK13 PIN 4	D3L
( )	SK13 PIN 4 (2S)	SKI4 PIN 4 (1S)	D3L
( )	SK7 PIN 5 (1S)	SK8 PIN 5	D4L
( )	SK8 PIN 5 (2S)	SK9 PIN 5	D4L
( )	SK9 PIN 5 (2S)	SK10 PIN 5	D4L
( )	SK10 PIN 5 (2S)	SK11 PIN 5	D4L
( )	SK11 PIN 5	SK12 PIN 5	D4L
( )	SK12 PIN 5 (2S)	SKI3 PIN 5	D4L
( )	SK13 PIN 5 (2S)	SKI4 PIN 5 (1S)	D4L
( )	SK7 PIN 6 (1S)	SK8 PIN 6	D5L
( )	SK8 PIN 6 (2S)	SK9 PIN 6	D5L
( )	SK9 PIN 6 (2S)	SK10 PIN 6	D5L
( )	SKI0 PIN 6 (2S)	SK11 PIN 6	D5L
( )	SK11 PIN 6	SK12 PIN 6	D5L
( )	SK12 PIN 6 (2S)	SK13 PIN 6	D5L
( )	SK13 PIN 6 (2S)	SK14 PIN 6 (1S)	D5L
( )	SK7 PIN 7 (1S)	SK8 PIN 7	D6L
( )	SK8 PIN 7 (2S)	SK9 PIN 7	D6L
( )	SK9 PIN 7 (2S)	SK10 PIN 7	D6L
( )	SK10 PIN 7 (2S)	SKtt PIN 7	D6L
( )	SK1l PIN 7	SK12 PIN 7	D6L
( )	SK12 PIN 7 (2S)	SK13 PIN 7	D6L
( )	SKI3 PIN 7 (25)	SK14 PIN 7 (1S)	D6L
( )	SK7 PIN 8 (1S)	SK8 PIN 8	D7L
( )	SK8 PIN 8 (2S)	SK9 PIN 8	D7L
( )	SK9 PIN 8 (2S)	SK10 PIN 8	D7L

INTRA-I/O CONNECTOR WIRING

	FROM	TO	REF DESIG
( )	SK10 PIN 8 (2S)	SK1l PIN 8	D7L
( )	SK11 PIN 8	SK12 PIN 8	D7L
( )	SK12 PIN 8 (2S)	SK13 PIN 8	D7L
( )	SK13 PIN 8 (2S)	SK14 PIN 8 (1S)	D7L

OUTPUT DATA BUSS WIRING

The following wires connect the data buss for the output ports (installed on the I/O connectors by the wiring just completed) to the SCELBI-8B mini-computer. To install these wires strip one end of a piece of wire 1/4 of an inch and connect the stripped end to the designated pin on the I/O connector, then route the wire up the center of the chassis until it almost reaches the printed circuit connector in slot XA9, then bend the wire at a right angle and run it parallel with the printed circuit card socket until it reaches the designated pin. Now, leave about 3/4 inch additional wire, cut and strip the wire 1/4 of an inch and make the connection at the printed circuit card socket. As the wires are installed keep them neatly dressed in a bundle, using pieces of masking tape if necessary. All the wires going to the card sockets will form a cable that will be secured with tie-wraps when the wiring has been completed.

	FROM	TO	REF DESIG
( )	SK10 PIN 1 (3S)	XA9 PIN B-K (1S)	D0L
( )	SKI0 PIN 2 (3S)	XA9 PIN B-L (1S)	D1L
( )	SKI0 PIN 3 (3S)	XA9 PIN B-M (1S)	D2L
( )	SKI0 PIN 4 (3S)	XA9 PIN B-N (1S)	D3L
( )	SK11 PIN 5 (3S)	XA9 PIN B-P (15)	D4L
( )	SK11 PIN 6 (3S)	XA9 PIN B-R (1S)	D5L
( )	SK11 PIN 7 (3S)	XA9 PIN B-S (1S)	D6L
( )	SK11 PIN 8 (3S)	XA9 PIN B-T (1S)	D7L

OUTPUT STROBE WIRING

The following wires connect the output strobe lines for the output ports from the DBB & Output card that resides in slot XA3. Run the wires from the designated output socket up the middle of the chassis and then over to the appropriate pin on the card socket.

OUTPUT STROBE WIRING

	FROM	TO	REF DESIG
( )	SK7 PIN 9 (1S)	XA3 PIN A15 (1S)	OS0
( )	SK8 PIN 9 (1S)	XA3 PIN A16 (1S)	OS1
( )	SK9 PIN 9 (1S)	XA3 PIN AI7 (1S)	OS2
( )	SK10 PIN 9 (1S)	XA3 PIN A18 (1S)	OS3
( )	SK11 PIN 9 (1S)	XA3 PIN A19 (1S)	0S4
( )	SK12 PIN 9 (1S)	XA3 PIN A20 (1S)	OS5
( )	SK13 PIN 9 (1S)	XA3 PIN A21 (1S)	0S6
( )	SK14 PIN 9 (1S)	XA3 PIN A22 (1S)	0S7

INPUT PORT WIRING

The following wires connect the input port connectors to the input card that resides in slot XA4. Run the wires from the designated input socket up the middle of the chassis and then over to the appropriate pin on the card socket.

	FROM	TO	REF DESIG
( )	SK1 PIN 1 (1S)	XA4 PIN A-H (1S)	INP00
( )	SK1 PIN 2 (1S)	XA4 PIN A-J (1S)	INP01
( )	SK1 PIN 3 (1S)	XA4 PIN A-K (1S)	INP02
( )	SK1 PIN 4 (1S)	XA4 PIN A-L (1S)	INP03
( )	SK1 PIN 5 (1S)	XA4 PIN A-M (1S)	INP04
( )	SK1 PIN 6 (1S)	XA4 PIN A-N (1S)	INP05
( )	SK1 PIN 7 (1S)	XA4 PIN A-P (1S)	INP06
( )	SK1 PIN 8 (1S)	XA4 PIN A-R (1S)	INP07
( )	SK2 PIN 1 (1S)	XA4 PIN A7 (1S)	INP10
( )	SK2 PIN 2 (1S)	XA4 PIN A8 (1S)	INP11
( )	SK2 PIN 3 (1S)	XA4 PIN A9 (1S)	INP12
( )	SK2 PIN 4 (1S)	XA4 PIN Al0 (1S)	INP13
( )	SK2 PIN 5 (1S)	XA4 PIN All (1S)	INP14
( )	SK2 PIN 6 (IS)	XA4 PIN A12 (1S)	INP15

INPUT PORT WIRING

	FROM	TO	REF DESIG
( )	SK2 PIN 7 (1S)	XA4 PIN A13 (1S)	INP16
( )	SK2 PIN 8 (1S)	XA4 PIN A14 (1S)	INP17
( )	SK3 PIN 1 (1S)	XA4 PIN B-A (1S)	INP20
( )	SK3 PIN 2 (1S)	XA4 PIN B-B (1S)	INP21
( )	SK3 PIN 3 (1S)	XA4 PIN B-C (1S)	INP22
( )	SK3 PIN 4 (1S)	XA4 PIN B-D (1S)	INP23
( )	SK3 PIN 5 (1S)	XA4 PIN B-E (1S)	INP24
( )	SK3 PIN 6 (1S)	XA4 PIN B-F (1S)	INP25
( )	SK3 PIN 7 (1S)	XA4 PIN B-H (1S)	INP26
( )	SK3 PIN 8 (1S)	XA4 PIN B-J (1S)	INP27
( )	SK4 PIN 1 (1S)	XA4 PIN Bl (1S)	INP30
( )	SK4 PIN 2 (1S)	XA4 PIN B2 (1S)	INP31
( )	SK4 PIN 3 (1S)	XA4 PIN B3 (1S)	INP32
( )	SK4 PIN 4 (1S)	XA4 PIN B4 (1S)	INP33
( )	SK4 PIN 5 (1S)	XA4 PIN B5 (1S)	INP34
( )	SK4 PIN 6 (1S)	XA4 PIN B6 (1S)	INP35
( )	SK4 PIN 7 (1S)	XA4 PIN B7 (1S)	INP36
( )	SK4 PIN 8 (1S)	XA4 PIN B8 (1S)	INP37
( )	SK5 PIN 1 (1S)	XA4 PIN B-K (1S)	INP40
( )	SK5 PlN 2 (1S)	XA4 PIN B-L (1S)	INP4l
( )	SK5 PIN 3 (1S)	XA4 PIN B-M (1S)	INP42
( )	SK5 PIN 4 (1S)	XA4 PIN B-N (1S)	INP43
( )	SK5 PIN 5 (1S)	XA4 PIN B-P (1S)	INP44
( )	SK5 PIN 6 (1S)	XA4 PIN B-R (1S)	INP45
( )	SK5 PIN 7 (1S)	XA4 PIN B-S (1S)	INP46
( )	SK5 PIN 8 (1S)	XA4 PIN B-T (1S)	INP47
( )	SK6 PIN 1 (1S)	XA4 PIN B9 (1S)	INP50
( )	SK6 PIN 2 (1S)	XA4 PIN Bl0 (1S)	INP51

INPUT PORT WIRING

	FROM	TO	REF DESIG
( )	SK6 PIN 3 (1S)	XA4 PIN Bl1 (1S)	INP52
( )	SK6 PIN 4 (1S)	XA4 PIN B12 (1S)	INP53
( )	SK6 PIN 5 (1S)	XA4 PIN BI3 (1S)	INP54
( )	SK6 PIN 6 (1S)	XA4 PIN B14 (1S)	INP55
( )	SK6 PIN 7 (1S)	XA4 PIN Bl5 (1S)	INP56
( )	SK6 PIN 8 (1S)	XA4 PIN Bl6 (1S)	INP57

You have now completed the wiring for the SCELBI-8B chassis. At this time it is generally a good idea to take a few minutes to perform a check of the wiring you have installed. Use an ohm-meter or circuit continuity tester and go back over the wiring, list to make sure that each wire has been connected to the proper point. When you have rechecked your work you may use the plastic tie-wraps at several places along the wires you have installed to form a neat and sturdy cable.

Your chassis is ready to accept the SCELBI-8B mini-computer card set. Proceed to the section on initial installation and check out of your SCELBI-8B mini-computer!

SECTION III

SCELBI-8B INITIAL INSTALLATION AND CHECK OUT PROCEDURES

Initial installation and check out of the SCELBI-8B minicomputer is straight forward. The procedure consist essentially of connecting a power supply. Plugging the cards into the appropriate card sockets, and verifying proper operation by loading and executing several simple programs.

CONNECTION OF THE POWER SUPPLY

The SCELBI-8B minicomputer requires a power supply capable of delivering +5 volts and -9 volts (plus or minus 5%). The current requirements of the supply depend on the amount of memory in the system (and any additional peripheral units which may be connected to the supply). The amount of current that the power supply must be capable of delivering for a particular system can be calculated using the current values given in the technical description section of the SCELBI-8B user's manual.

If you purchased a SCELBI power supply with your system. You need only to connect the power supply to the computer V.I.A. the power cable provided. If you are providing your own supply. You may want to install the 4 pin female power connector provided with the SCELBI-8B chassis unit on your pover supply. This connector mates with the power cable

To provide a quick and easy connection method. The pin assignments for the power cable are shown below.

Power coknector pin #1: +5 Volts
Power connector pin #2: D.C. common/signal ground
Power connector pin #3: D.C. common/signal ground
Power connector pin #4: -9 volts

If you have provided your own supply it is recommended that you perform a test to ensure that your power supply connections are correct before plugging in the SCELBI-8 computer card set to the chassis unit. To do this, simply turn on your power supply after it has been connected to the chassis unit and verify that +5 volts is present between pins at A1 (+5) and A3 (common) as well as between AA (+5) and AC (common) on the "A" card sockets. Then ascertain that -9 volts is present between pins A5 (-9) and A3 (common) as well as pins AE (-9) and AC (common). Be sure that the voltage polarity is correct!

NOTICE

It is extremely important that correct voltage polarity exists to the SCELBI-8B computer cards. While each SCELBI card is fused and diode protected as a precaution against incorrect power connections (as well as over-voltage) these protection circuits are intended only to serve as momentary protective devices. SCELBI cards that have been damaged because of the application of incorrect voltages are not covered by the SCELBI warranty.

INSTALLATION OF CARDS

Before plugging in the SCELBI-8B card set make certain that the power supply to the unit is turned off. Never plug, or unplug, cards into the chassis unit when pover is connected.

Refer to the top view chassis drawing provided with this documentation and install cards into the chassis unit as follows. Make sure the component side of the cards is facing towards the front of the chassis unit.

Plug the #1104 Front panel card into slot #1 (front-most slot)

Plug the #1100 CPU card into slot #2.

Plug the #1101 DBB & Output card into slot #3.

Plug the #1102 Input card into slot #4.

Plug the #1106 Memory expander card into slot #5.

Plug #1107 ram or #1109 ROM/PROM cards into slots #6 - 9, as appropriate remembering that the slot position chosen will select the "page numbers" of memory that will be selected. The "page numbers" enabled by each memory card slot position are given in the top view chassis drawing referenced above.

INITIAL OPERATION

When the cards have been installed in their appropriate slots your SCELBI-8B minicomputer is ready to operate.

Apply power to the unit and immediately observe the power indicator lamps on the front panel card to verify that the +5 and -9 voltages are present. Never attempt to operate the SCELBI-8B if either voltage is absent.

With proper power applied to the unit you may now proceed to start operating your SCELBI-8B. You should familiarize yourself with the information in the SCELBI-8B user's manual. Section three (pink section) in the manual presents detailed operating instructions.

To start operations, you should turn to page 5 of section 3 in the SCELBI-8B user's manual and follow the instructions for initializing the SCELBI-8B following power turn-on. It is then suggested that you proceed to load and have the computer perform the small "jump to itself" program that is illustrated starting on page 7 of section 3.

You might then load and execute the simple memory diagnostic program described starting on page 21 of section 3 of the manual.

You may then go on to load and execute the light flasher program described on page 27 in section 3.

Or, you may start to develop and execute your own programs, or load and operate SCELBI programs.

If you have purchased SCELBI peripheral units. The connection and operation of those units will be covered by documentation provided with those devices.

IN CASE OF DIFFICULTY

Should improper operation occur during the check out procedures we suggest that you first check that the P.C. Cards are properly seated in their sockets. The next step if the difficulty persists would be to recheck any wiring that you installed, to verify that the power supply voltages are correct and properly connected to the SCELBI-8B, and that you make certain you are operating the unit correctly. Customers who assembled card sets may want to refer to the section provided at the end of the discussion on card assemblies which provides some advice on the initial checking of individual cards should difficulties arise when the cards are first installed.

N O T E

If you are not familiar with the operation of a computer you should be advised that the most common source of problems with the machine are the result of "operator errors." Since the machine is fully programmable - it will (indeed is only able to) follow precisely the instructions given to it by the operator or program residing in memory. If you think the computer is not operating correctly we advise you to carefully recheck the program or instructions you are asking it to perform before jumping to any conclusion that the machine is malfunctioning. From years of experience we at SCELBI can advise you that the newcomer to minicomputer programming and operation will make many mistakes before becoming an adept programmer, and there seems to be a natural tendency for the new programmer to immediately assume that the machine is not operating correctly when a program does not perform as the novice programmer intended. As a general rule of thumb, when a program does not perform properly, the last thing to consider is a hardware malfunction.

DOCUMENTATION

Your SCELBI-8B user's manual contains full documentation including schematics. Assembly drawings and wire list(s), and parts lists for the individual cards. You may refer to those drawings to gain insight into the machine's operation, or as technical references should trouble ever occur with your system.

MAINTENANCE PROCEDURES

The only normal maintenance required by the SCELBI-8B is that the unit be periodically dusted to prevent excessive heat from building up around components. A small, soft, clean paint brush is an ideal tool to use to clean the printed circuit cards of dust.

TECHNICAL INFORMATION

A minimum SCELBI-8B minicomputer consists of a set of six P.C. cards (described in detail later in this section) which plug into P.C. card sockets. The sockets may be inter-connected by hand wiring if desired. However, customers who purchase a SCELBI-8B chassis are provided with a double-sided back plane harness board that eliminates about 15 hours of hand wiring. The use of a printed circuit back plane harness board also greatly enhances the long term reliability of the SCELBI-8B minicomputer. The standard SCELBI-8B chassis with the back plane harness card has P.C. card sockets for expanding the memory capacity of the system up to 16,384 words by simply plugging in additional memory cards. The SCELBI-8B chassis has 11 switches along the front which serve as the computer operator's console switches. The rear apron of the chassis holds 14 I/O connectors and a power connector. Pictorials of the basic chassis structure are illustrated in the chassis assembly instructions section of this chapter.

The entire SCELBI-8B minicomputer measures approximately 13 inches in width, by 11 inches in height by 10 inches in depth. A 16 k word unit weighs about 8 pounds. An optional cabinet in which to house the chassis unit is available.

Printed circuit cards used in the SCELBI-8B are made of commercial grade glass epoxy (G10) material. Cards have two ounce tinned copper lands on both sides and plated-through holes are used to connect foil patterns through the card. The standard card size is 9 inches wide by 6.4 Inches in height (including the connector fingers). The standard cards plug into pairs of 44 pin P.C. Card sockets which have a spacing of 0.156 Inches between contacts. (Amphenol type 22221-404 or equivalent sockets.)

Separate power supply capable of delivering plus five volts and minus 9 volts is required by the computer. Current requirements depend on the amount of memory in a system (and the number of peripheral units that utilize the supply). Power requirements for individual computer cards used in the SCELBI-8B system are specified in the technical description for each card.

BRIEF FUNCTIONAL DESCRIPTION OF THE SCELBI-8B CARD SYSTEM

The over all operation of a SCELBI-8B minicomputer centers around the SCELBI #1100 cpu card. This card contains an Intel '8008' "cpu-on-a-chip," a master clock circuit for providing timing for the system, and a network of state control and multiplexing logic.

A bi-directional address/data buss on the 8008 integrated circuit feeds addresses/data from the chip to buffers on the cpu card. The data/addresses are then sent to the SCELBI #1101 DBB (data bus buffer) and Output card where it is latched and buffered for further distribution. The outputs of the latches on the #1101 DBB & Output card are used to select memory addresses or I/O ports depending on the type of instructions being performed. The #1101 contains logic to decode memory addresses from page 00 to page 17, but this logic is not utilized in a standard SCELBI-8B system. The #1101 card also has circuits that decode the output port select strobe signal for any one of 16 output ports. (In a standard SCELBI-8B system, only the first eight of these output strobes are wired to I/O connectors on the chassis.) Buffered data from the #1101 card is made available

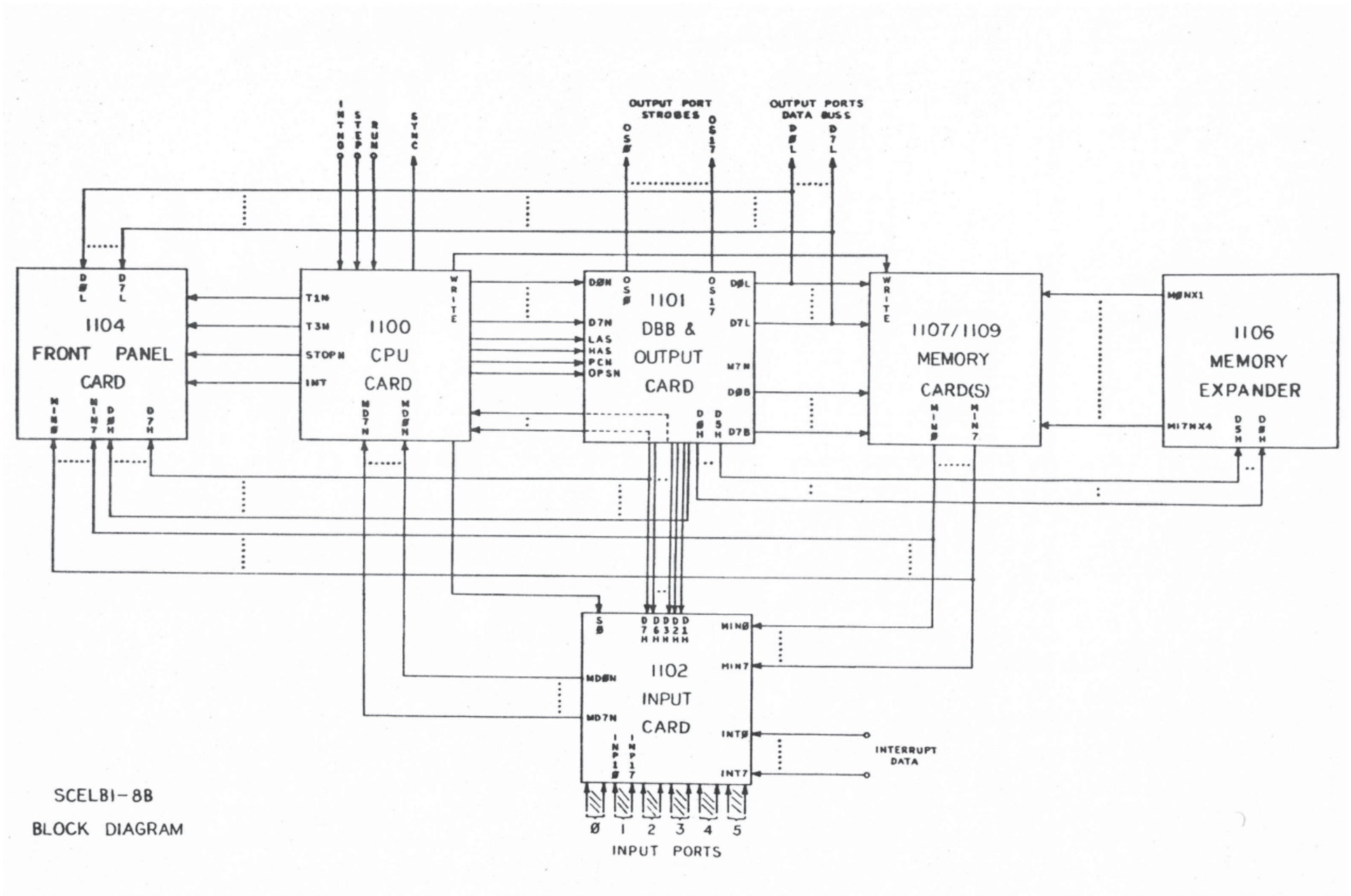
to the memory banks in the system as well as to the I/O ports.

Six of the latched high address lines from the #1101 card are fed to the #1106 memory expander card. Logic on the #1106 card selects any one of 64 sections of memory. Each section (called a "page") consists of 256 bytes of memory. Individual bytes on a page are selected by the latched low address lines fed from the #1101 card to the #1107 Ram Memory or #1109 ROM/PROM memory cards. The "page" select lines from the #1106 Memory Expander card are routed to the RAM or ROM/PROM memory cards in the system.

The buffered bi-directional address/data bus on the #1100 CPU card is able to receive data during multiplexed "receive" timing periods from the #1102 Input card. The #1102 Input card contains multiplexing logic which selects and passes data from any one of six input ports, the memory banks, or the chassis console switches on to the CPU card.

The SCELBI #1104 Front Panel card allows monitoring of the computer's operation. It can latch information being passed from memory to the cpu and monitor key logic signals from the CPU card. The information is then displayed on light emitting diode indicators for the convenience of the operator. The card also displays power status to the computer. For unattended operation, or applications where visual monitoring of the system is not required, the front panel card may be removed from the system.

A block diagram of the basic SCELBI-8B card system and general signal flow is present on the next page. More detailed descriptions of each card's operation is presented following the system block diagram.



SCELBI-8B

BLOCK DIAGRAM

SCELBI COMPUTER CONSULTING INC.

ASSEMBLY INSTRUCTIONS - SCELBI CARD #: 2100

OSCILLOSCOPE ALPHA-NUMERIC INTERFACE DIGITAL CARD

DESCRIPTION

The SCELBI oscilloscope alpha-numeric interface allows the user to utilize an oscilloscope as a peripheral device for displaying alpha-numberic information from the SCELBI mini-computer. The Oscilloscope Alph-numeric interface is composed of a digital card, an analog card, a power supply for the analog board, and an enclosure.

This section of the document describes the digital card. It forms the connection between the SCELBI main chassis to the the Oscilloscope analog board.

KIT ASSEMBLY

You should refer to the assembly drawing shown on the next page during the assembly process. The drawing is to scale and shows the exact location of each part on the P.C. card.

INSTALLATION OF INTEGRATED CIRCUITS

( ) Install five type 7475 integrated circuits in the locations labeled on the assembly drawing as: Z1, Z8, Z9, Z10 and Z18. When they have been installed, turn the card over and solder the pins on the I.C. to their foil pad.

( ) Install six type 7400 integrated circuits at the locations specified for Z2, Z3, Z11, Z15, Z19 and Z27. Then solder the pins of the integrated circuits to the card foil.

( ) Install and solder one type 7420 integrated circuit at the location shown for Z4.

( ) Install and solder two type 7402 integrated circuits at the locations shown for Z5 and Z12.

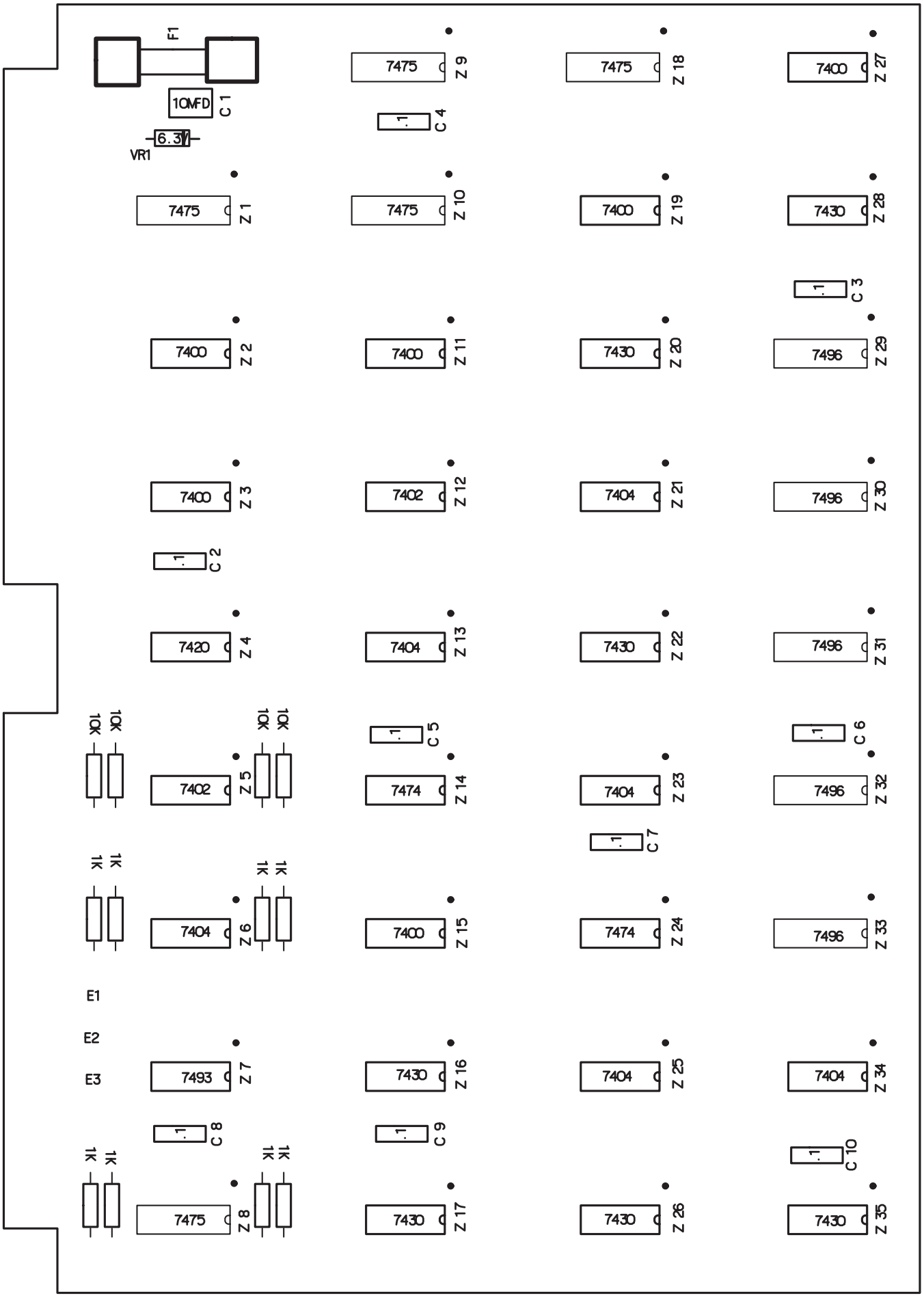
( ) Install and solder six type 7404 integrated circuit at the location shown for Z6, Z13, Z21, Z23, Z25 and Z34.

( ) Install and solder one type 7493 integrated circuit at the location shown for Z7.

( ) Install and solder two type 7474 integrated circuits at the locations shown for Z14 and Z14.

( ) Install and solder seven type 7430 integrated circuit at the locations shown for Z16, Z17, Z20, Z22, Z26, Z28 and Z35.

( ) Install and solder five type 7496 integrated circuit at the locations shown for Z29, Z30, Z31, Z32, and Z33.


F1
10MFD
C 1
6.3V
VR1
7475
Z 1
7475
Z 9
7475
Z 18
7400
Z 27
.1
C 4
7475
Z 10
7400
Z 19
7430
Z 28
.1
C 3
7400
Z 2
7400
Z 11
7430
Z 20
7496
Z 29
7400
Z 3
7402
Z 12
7404
Z 21
7496
Z 30
.1
C 2
7420
Z 4
7404
Z 13
7430
Z 22
7496
Z 31
10K
10K
10K
10K
.1
C 5
.1
C 6
7402
Z 5
7474
Z 14
7404
Z 23
7496
Z 32
.1
C 7
1K
1K
1K
1K
7404
Z 6
7400
Z 15
7474
Z 24
7496
Z 33
E1
E2
E3
7493
Z 7
7430
Z 16
7404
Z 25
7404
Z 34
.1
C 8
.1
C 9
.1
C 10
1K
1K
1K
1K
7475
Z 8
7430
Z 17
7430
Z 26
7430
Z 35

INSTALLATION OF RESISTORS

( ) Install eight 1K ohm (BRN-BLK-RED) 1/4 watt resistors at the locations shown on the assembly drawing for the 1K ohm resistors.

( ) Install four 10K ohm (BRN-BLK-ORN) 1/4 watt resistors at the locations shown on the assembly drawing for the 10K ohm resistors.

INSTALLATION OF DIODE

( ) Install one 6.3 volt zener diode at the location shown for VR1. Be sure and observe correct polarity as indicated on the drawing.

INSTALLATION OF CAPACITORS

( ) Install one 10 MFD electrolytic capacitor in the position labeled on the assembly drawing for C1. Be certain that the positive (+) end of the capacitor is oriented in the same direction as that shown on the drawing and indicated on the P.C. card.

( ) Install nine .1 UFD disk capacitors in the positions labeled on the assembly drawing C2 through C9.

INSTALLATION OF POLARITY SELECT JUMPER

( ) Install a jumper wire between two pads labeled E1 and E2 near location Z7.

INSTALLATION OF FUSE CLIPS

( ) Install the two P.C. Mounting fuse clips in the positions shown to hold fuse F1. Insert the two tabs on the base of each clip into the holes provided for each clip, bend the tabs slight against the foil on the other side of the board to hold them in place and then solder each tab to the foil. Ensure that the clips line up so that a fuse will seat properly when installed.

( ) Install a .75 ampere type 8AG fuse in the fuse clips for F1.

INITIAL INSPECTION AND TESTING

( ) At this time carefully inspect both sides of the board to ascertain that there are not any solder shorts between P.C. foil lands. Be especially observant on the component side of the card around the I.C. pins. Remove any solder shorts that are found.

( ) Use an ohm meter to make the following measurements:

Meter between pins A1 and A3 of the card connector - and then reverse the meter leads to obtain a second reading. The reading in both directions should be greater than (TBD) ohms. (One reading will typically be several times higher than the other.) If the readings are less than (TBD) ohms look for solder shorts between the +5 volt supply lines and the common return lines on the card.

FINAL TESTING

Final testing of the card must be done when the card is installed in the oscilloscope chassis and connected to a SCELBI minicomputer system.

SCELBI COMPUTER CONSULTING1 INC.

ASSEMBLY INSTRUCTIONS - SCELBI CARD #: 2101-

OSCILLOSCOPE ALPHA-NUMERIC INTERFACE ANALOG CARD

DESCRIPTION

This section of the document describes assembly of the SCELBI oscilloscope alpha-numeric interface analog card. It forms the connection between the SCELBI oscilloscope digital card to the the Oscilloscope display.

KIT ASSEMBLY

You should refer to the assembly drawing shown on the next page during the assembly process. The drawing is to scale and shows the exact location of each part on the P.C. card.

INSTALLATION OF INTEGRATED CIRCUITS

( ) Install four type 72741 integrated circuit into the locations labeled on the assembly drawing as Z1 through Z1. When it has been installed, turn the card over and solder the pins on the I.C. to their foil pad.

INSTALLATION OF RESISTORS

( ) Install two 130 ohm (BRN-OR-BRN) 1/4 watt resistors at the location shown on the assembly drawing for R1 and R13.

( ) Install four 1K ohm (BRN-BLK-RED) 1/4 watt resistors at the location shown on the assembly drawing for R2, R14, R32 and R33.

( ) Install four 3.3K ohm (OR-OR-OR) 1/4 watt resistors at the location shown on the assembly drawing for R3, R7, R15 and R18.

( ) Install five 10K ohm (BRN-BLK-OR) 1/4 watt resistors at the location shown on the assembly drawing for R4, R5, R8, R16, and R19.

( ) Install two 47K ohm (YEL-VLT-OR) 1/4 watt resistors at the location shown on the assembly drawing for R11 and R12.

( ) Install one 470K ohm (YEL-VLT-YEL) 1/4 watt resistor at the location shown on the assembly drawing for R21.

( ) Install one 3.9K ohm (OR-WHT-OR) 1/4 watt resistor at the location shown on the assembly drawing for R22.

( ) Install one 5K ohm (GRN-BLK-RED) 1/4 watt resistor at the location shown on the assembly drawing for R24.

( ) Install one 8.2K ohm (GRY-RED-RED) 1/4 watt resistor at the location shown on the assembly drawing for R26.

( ) Install one 2.2K ohm (RED-RED-RED) 1/4 watt resistor at the location shown on the assembly drawing for R28.

( ) Install one 1.5K ohm (BRN-GRN-RED) 1/4 watt resistor at the location shown on the assembly drawing for R29.

( ) Install one 220 ohm (RED-RED-BRN) 1/4 watt resistor at the location shown on the assembly drawing for R31.

INSTALLATION OF POTENTIOMETERS

( ) Install one 20K potentiometer at the location shown for R20.

( ) Install four 10K potentiometers at the location shown for R6, R9, R17 and R20.

( ) Install one 50K potentiometer at the location shown for R30.

( ) Install one 5K potentiometer at the location shown for R23.

INSTALLATION OF TRANSISTORS

( ) Install three 2n2222 type transistors at the location shown for Q1, Q3 and Q5. Be sure and observe the base pin is oriented as indicated on the drawing. The drawing shows the base pin for a plastic (TO-92) type package, if you have a transistor in metal can (TO-18) type package, be sure to consult data sheets and schematics to make sure you have base, emitter and collector all connected correctly.

( ) Install two 2n2907 type transistors at the location shown for Q2 and Q4. Be sure and observe the base pin is oriented as indicated on the drawing. The drawing shows the base pin for a plastic (TO-92) type package, if you have a transistor in metal can (TO-18) type package, be sure to consult data sheets and schematics to make sure you have base, emitter and collector all connected correctly.

INSTALLATION OF CAPACITORS

( ) Install four .01 MFD film type capacitors in the locations shown for C1, C2, C3 and C4.

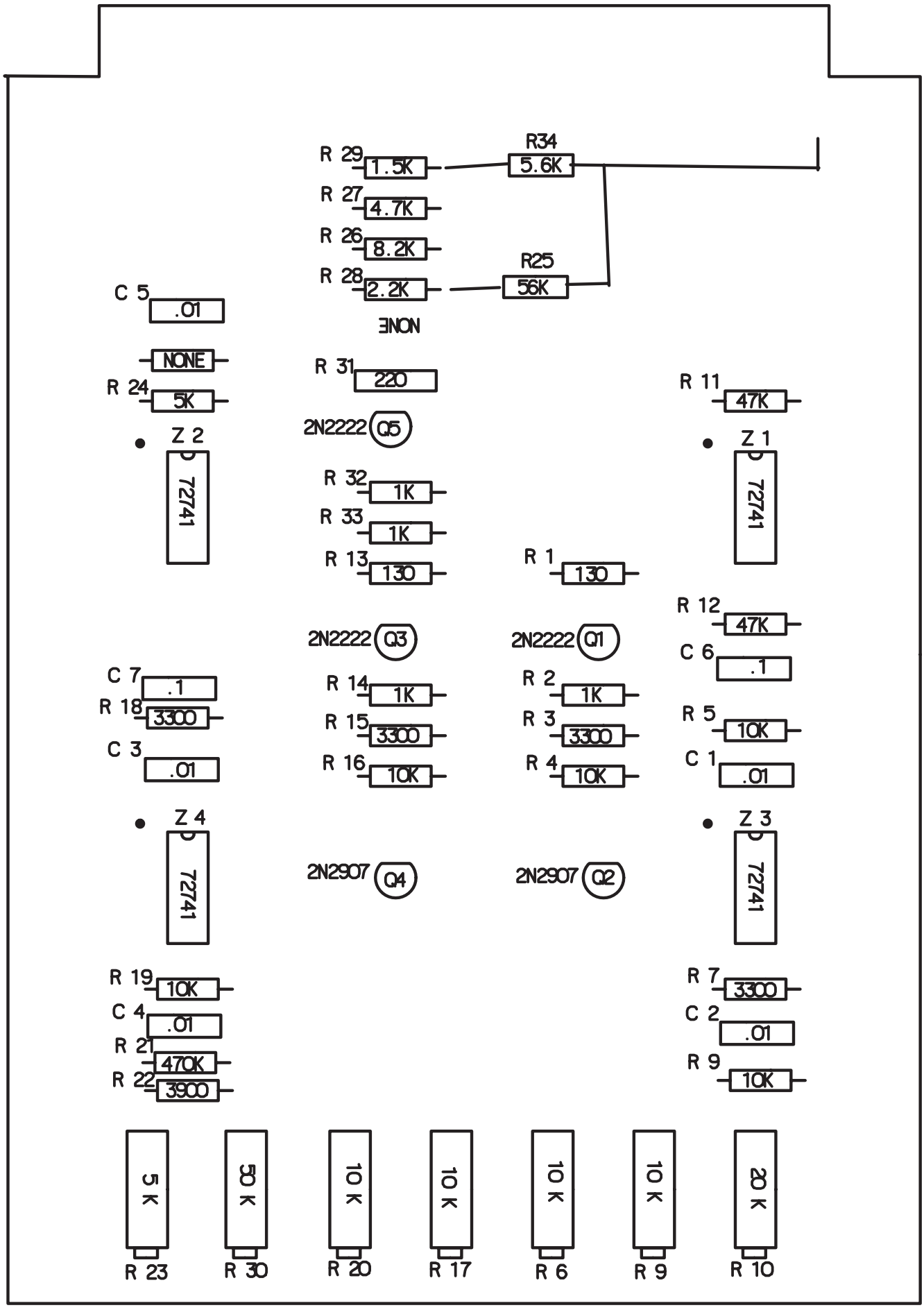
( ) Install one .01 MFD ceramic disc type capacitors in the location shown for C5.

( ) Install two .1 MFD ceramic disc type capacitor in the location shown for C6 and C7.

INSTALLATION OF RESISTORS R25 AND R34

( ) Install one 5.6 ohm (RED-RED-BRN) 1/4 watt resistor between the near lead of R29 and the pad for 18 volts near the first pin of the edge connector interface. You may need to tack an extra length of wire onto one of the resistor leads in order for the lead to reach the 18 volt pad.

( ) Install one 56K ohm (GRN-BLU-OR) 1/4 watt resistor between the leg of R28 and the side of the 5.6K ohm resistor (R34) that is connectted to 18 volts.


R 29
1.5K
R34
5.6K
R 27
4.7K
R 26
8.2K
R25
R 28
2.2K
56K
ENON
C 5
.01
NONE
R 24
5K
Z 2
72741
R 31
220
2N2222 Q5
R 32
1K
R 33
1K
R 13
130
R 11
47K
Z 1
72741
R 1
130
R 12
47K
C 6
.1
2N2222 Q3
2N2222 Q1
C 7
.1
R 18
3300
C 3
.01
R 14
1K
R 15
3300
R 16
10K
R 2
1K
R 3
3300
R 4
10K
R 5
10K
C 1
.01
Z 4
72741
Z 3
72741
2N2907 Q4
2N2907 Q2
R 19
10K
C 4
.01
R 21
470K
R 22
3900
R 7
3300
C 2
.01
R 9
10K
5 K
R 23
50 K
R 30
10 K
R 20
10 K
R 17
10 K
R 6
10 K
R 9
20 K
R 10

INITIAL INSPECTION AND TESTING

( ) At this time carefully inspect both side of the board to ascertain that there are not any solder shorts between P.C. foil lands. Be especially observant on the component side of the card around the I.C. pins. Remove any solder shorts that are found.

( ) Use an ohm meter to make the following measurements:

Meter between pins A1 and A3 of the card connector - and the reverse the meter leads to obtain a second reading. The reading in both directions should be greater than (TBD) ohms. (One reading will typically be several times higher than the other.) If the readings are less than (TBD) ohms look for solder shorts between the +5 volt supply lines and the common return lines on the card.

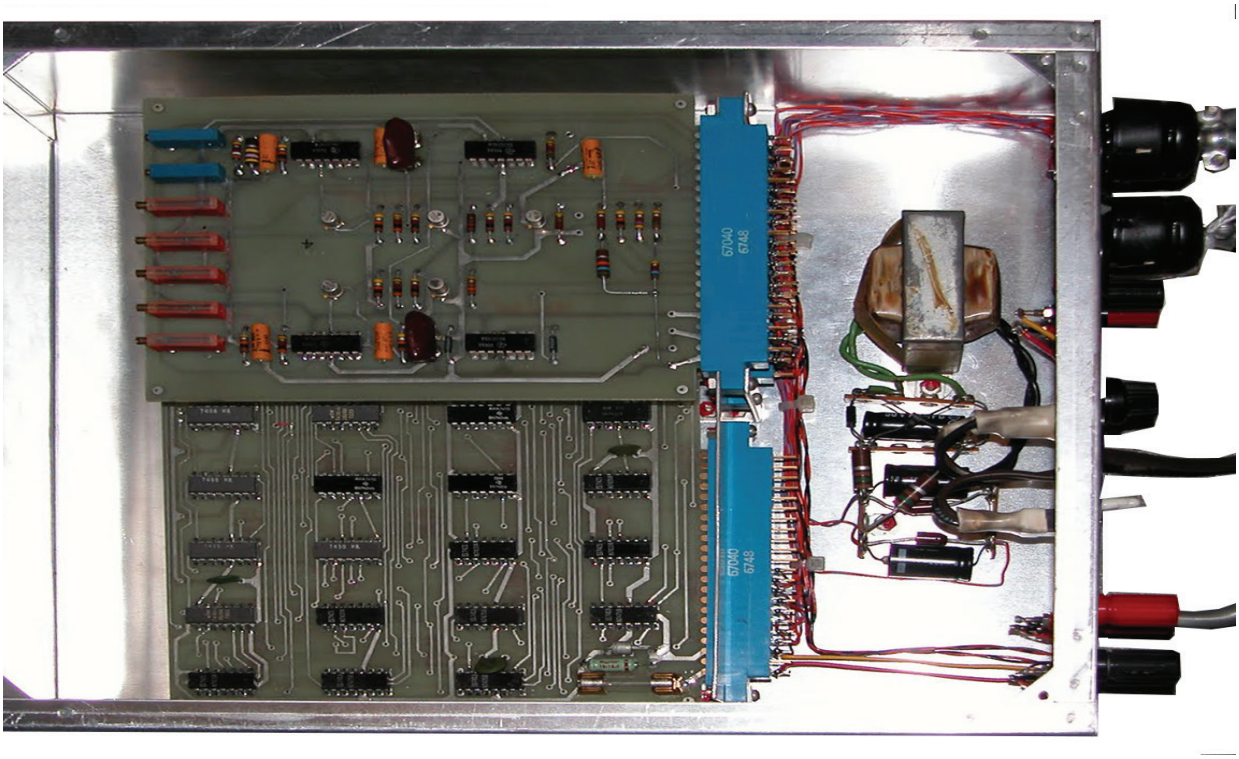
FINAL TESTING

Final testing of the card must be done when the card is installed in the oscilloscope chassis and connected to a SCELBI minicomputer system.

SCELBI COMPUTER CONSULTING1 INC.

CONSTRUCTION INSTRUCTIONS

OSCILLOSCOPE ALPHA-NUMERIC INTERFACE CHASSIS



DESCRIPTION

This section of the document describes construction of the SCELBI oscilloscope alpha-numeric interface chassis. The chassis holds all the components of the oscilloscope interface, including connectors, digital board, analog board and analog power supply.

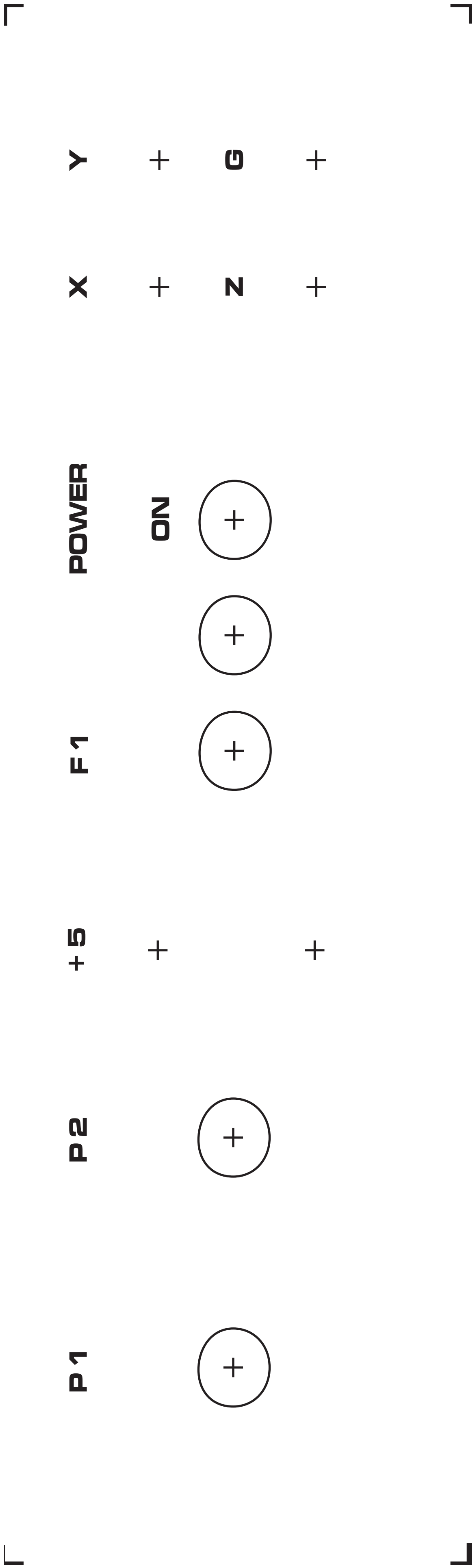
CHASSIS CONSTRUCTION

You should refer to the drawing shown on the next page during the construction process. The drawing is actual size and designed with an off the shelf BUD AC-413 chassis in mind. This chassis is 3” high, but original SCELBI chassis were 3 1/2” high, so adjustments must be made if you fabricate or find an original height chassis.

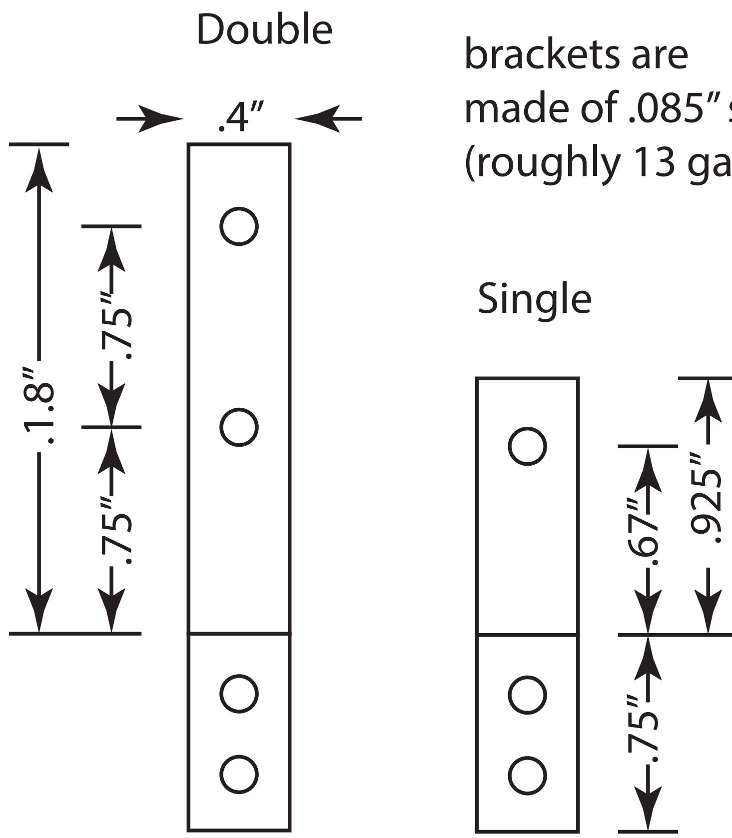
DRILL HOLES IN FRONT PANEL

( ) Drilling through aluminum can be difficult as drill bits tend to wander before starting to cut. It is best to use a center punch to make a depression in the sheet metal, which will help prevent the drill bit from wandering. Print out the template on the next page actual size. Cut to make a 3”x 10” template. Use painters tape to hold the template on the front of the chassis. Use the marks on the template as a guide in punching centers of each hole in the chassis

EDGE CONNECTOR MOUNTING " L"BRACKETS



FRONT PANEL LAYOUT



brackets are made of .085″ steel (roughly 13 gauge)

EDGE CONNECTOR BEZEL AND MOUNTING BRACKET LOCATIONS

( ) To create the hole for the P1 & P2 (amphenhol conectors), it is easiest to use a Greenlee 732 size 1 11/64” chassis punch. First drill a 1/2” pilot hole, then use the instructions that come with the chassis punch to complete the holes.

( ) The size of the other holes in the front panel depend upon the exact components that you have selected. Typical holes sizes for banana jacks are 1/2”. Check manufacturers specifications, if you can find them, or measure the component before drilling the hole.

APPLY TRANSFER LETTERING TO FRONT PANEL

( ) Use a straight edge to place painters tape as a guide in keeping the lettering straight

( ) Use rounded, but pointy object like a dull pencil or ball point pen to rub on lettering.

( ) Spray several layers of clear satin laquer over the top to protect the lettering.

MOUNT CONNECTORS ON FRONT PANEL

( ) Mount the amphenol sockets on the front panel using the snap rings. This can be tricky. Start from one end, and work the slip ring into the slot in the connector.

( ) The banana jack’s mounting posts must be centered in their mounting holes so that the post does not short on the chassis.

( ) The fuse holder and on/off switch mount with nuts that are provided with the components.

( ) The power cord is mounted in the strain relief bushing and then the bushing pushed into place.

FABRICATE EDGE CONNECTOR MOUNTING “L” BRACKETS AND BEZEL

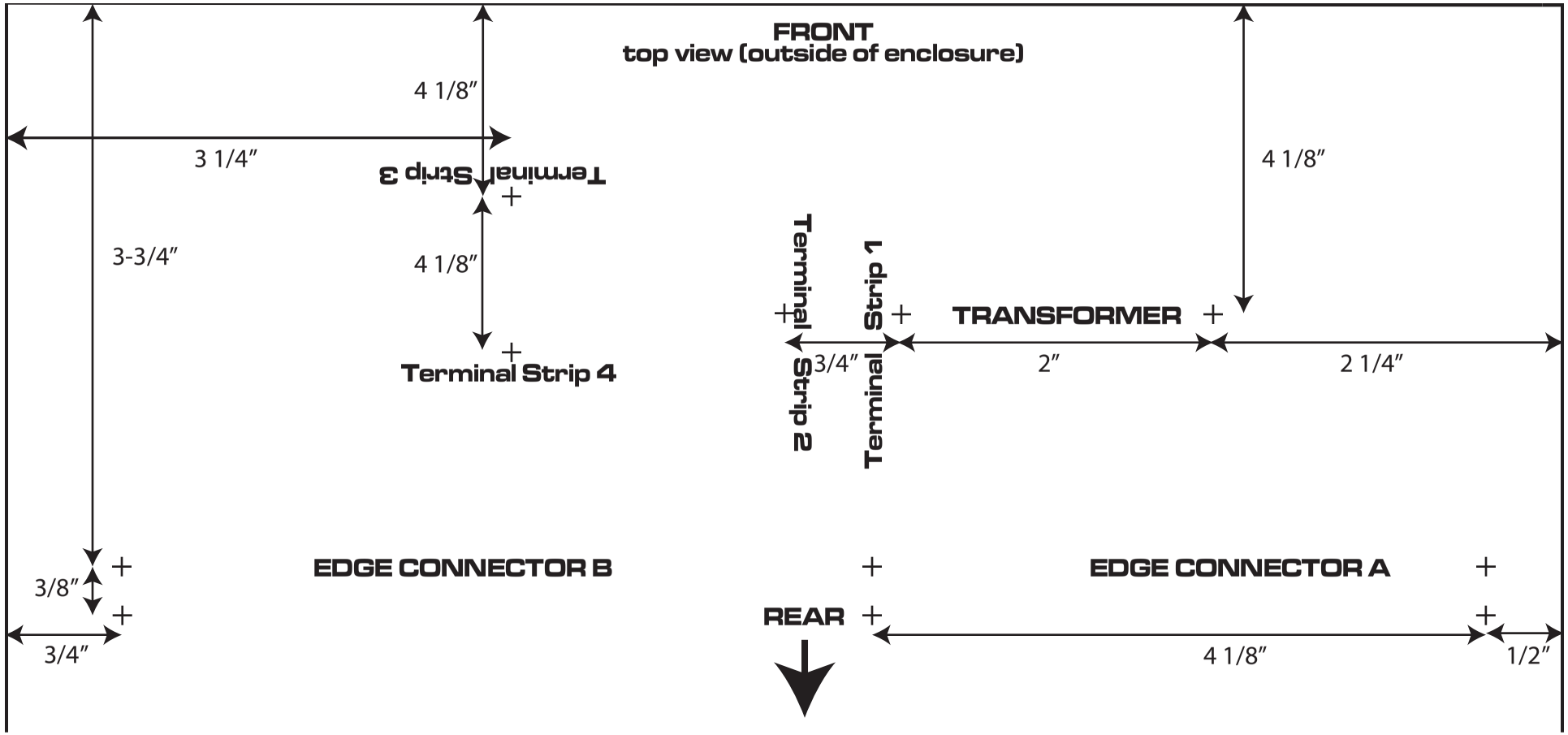
( ) Fabricate the three edge connector mounting brackets for the three edge connectors. Two of the brackets are double height and one is single height.

( ) Fabricate and attache the edge connector bezel for the “front” of the edge connectors. This bezel acts as a front panel and holds the edge connectors in alignment. Exact dimensions depend upon the edge connector type that you are using.

( ) Attach the three edge connector mounting brackets and the edge connector bezel to the three edge connectors using appropriate sized screws.

DRILL HOLES IN TOP OF CHASSIS

( ) You can use the template on the next page as a guide for making the holes. Before drilling any holes, place the components in position. Note that terminal strip 1 shares the mounting hole and screw with one side of the transformer. Make sure that you have ample clearence for running and soldering wires. Also make sure that there is room to mount PCBs into the edge connectors, that there is room for wiring the edge connectors and there is room to adjust the variable resistors of the analog board when it is installed. The attached figure shows mount points that would work with specified transformer.


FRONT
top view (outside of enclosure)
4 1/8″
3 1/4″
Terminal Strip 3
3-3/4″
4 1/8″
Terminal Strip 4
Terminal Strip 1
TRANSFORMER
4 1/8″
3/4″
2″
2 1/4″
Terminal Strip 2
3/8″
EDGE CONNECTOR B
EDGE CONNECTOR A
REAR
3/4″
4 1/8″
1/2″

If you use a different transformer be aware that it must be mounted such that there is room for front panel switches and connectors on one side and the printed circuit cards on the other.

( ) I use #6 machine screws to fasten the transformer, terminal strips and edge connectors to the top of the chassis. You can use a 1/8” drill bit to make clearance holes for #6 machine screws.

( ) Finallalize positioning and drill the holes, using the same techniques as used for drilling the holes in the front panel.

MOUNT TRANSFORMER AND TERMINAL STRIP 1 TO TOP OF CHASSIS

( ) Use the template on the previous page as guide for mounting the transformer. One end of the transformer shares a screw with terminal strip 1. The mounting eye for terminal strip 1 is on the transformer side of the terminal strip. Use two #6 screws with matching nuts and lock washers to attach the transformer and terminal strip 1 to the chassis.

MOUNT REST OF TERMINAL STRIPS

( ) Mount terminal strip 2 to the chassis, with the mounting eye on the side of the terminal strip closest to the transformer.

( ) Mount terminal strips 3 and 4 to the chassis. The mounting eye should be located between the two terminal strips.

SCELBI COMPUTER CONSULTING INC.

ASSEMBLY INSTRUCTIONS

OSCILLOSCOPE ALPHA-NUMERIC INTERFACE POWER SUPPLY AND EDGE CONNECTOR WIRING

DESCRIPTION

The SCELBI oscilloscope alpha-numeric interface allows the user to utilize an oscilloscope as a peripheral device for displaying alpha-numberic information from the SCELBI mini-computer. The Oscilloscope Alpha-numeric interface is composed of a digital card, an analog card, a power supply for the analog board, and an enclosure.

This section of the document describes how to wire the chassis.

CONNECTING THE CENTRAL GROUND

( ) Use short lengths of wire to short the terminals on Terminal Strip 3, the ground terminal strip. These terminals are the central ground for all components of the oscilloscope interface.

( ) Connect terminal strip 3 to the banana plug ground on the front panel.

( ) Do not connect ground to ground pins on Amphenol connector as this could create a ground loop and cause your system to operate erratically.

CONNECTING THE TRANSFORMER

( ) You should refer to the wiring drawing shown on the next page during the transformer wiring process.

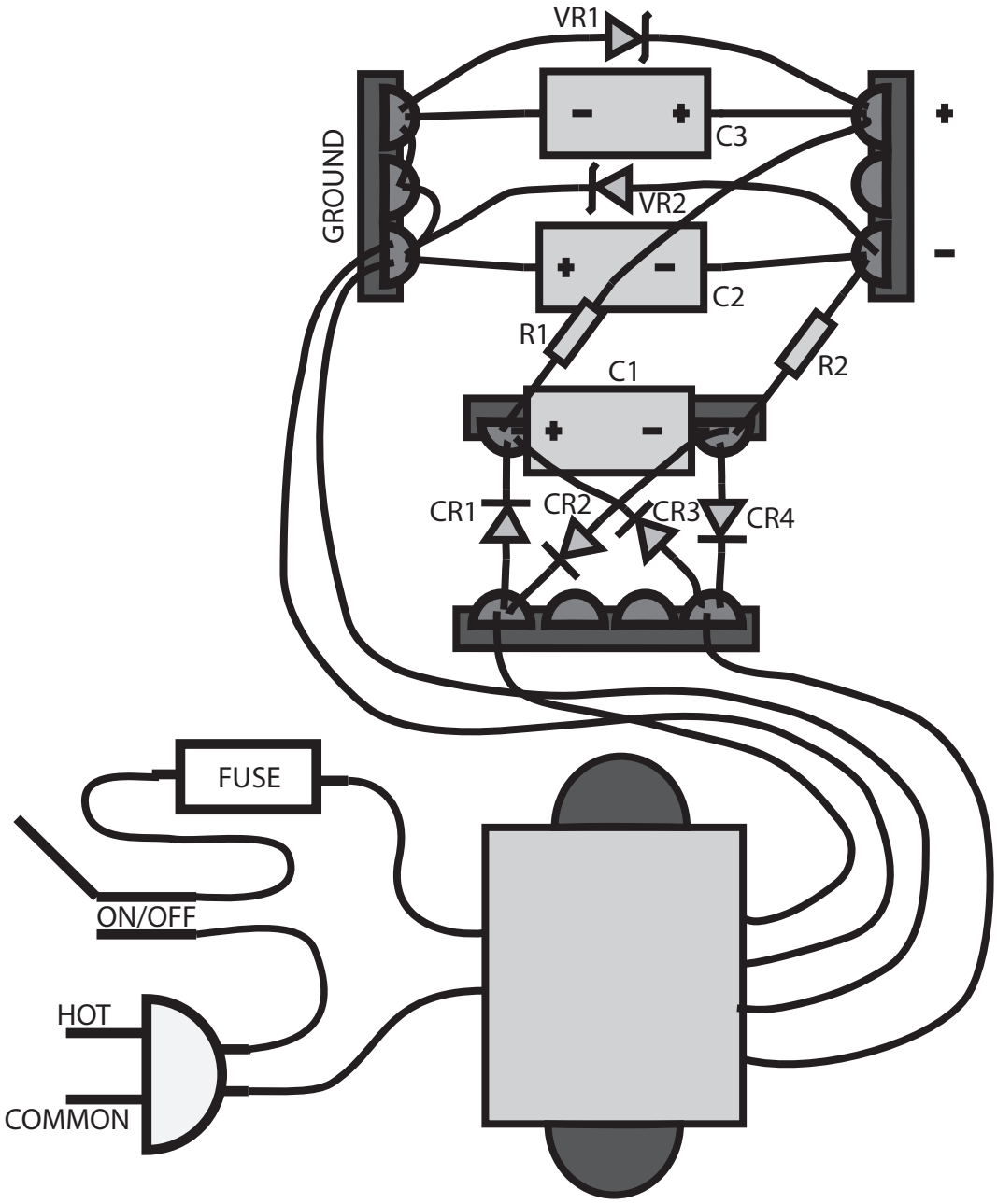
( ) Connect both center taps of the transformer to the ground terminals.

( ) Connect one of the two secondary terminals to the end terminal of the nearby four terminal strip.

( ) Connect the other secondary terminal of the transformer to the other end terminal of the nearby four terminal strip.

( ) The primary side wires of the transformer are connected to the plug that will go directly to your home wiring. The specified transformer is designed for American 110 volt AC mains. People in other countries should find an appropriate transformer for their home voltage. The live or “hot” side of the mains wiring should be connected to the on/off switch, the fuse and through to one of the transformer primary wires. This is the wire connected to the narrower of the plug prongs.

( ) The “neutral side of the mains wiring can be connected directly to the other transformer primary wire. This is the wire connected to the wider of the plug prongs.



INSTALLATION OF RECTIFIER DIODES

( ) Install the four rectifier diodes as show in the diagram for CR1, CR2, CR3 and CR4. The diodes must be oriented correctly, as shown in the diagram. Since the leads for CR2 could short with other components in the power supply, it is best to protect these leads with shrink wrap tubing.

INSTALLATION OF RESISTORS

( ) Install the 22 ohm (RED-RED-BLK) resistor, R1, between the positive terminal of the rectified output and the positive terminal of the power supply. Since the leads for this resistor could short with other components in the power supply, it is best to protect the leads with shrink wrap tubing.

( ) Install the 220 ohm (BRN-RED-BRN) resistor, R2, between the negative terminal of the rectified output to the negative terminal of the power supply.

INSTALLATION OF ZENOR DIODES

( ) Install one 18 volt zener diode between the + terminal and the ground terminal (VR1). The zener must be oriented correctly, as shown in the diagram.

( ) Install one 18 volt zener diode between the - terminal and the ground terminal (VR2). The zener must be oriented correctly, as shown in the diagram.

INSTALLATION OF CAPACITORS

( ) Install one 470 MFD electrolytic capacitor in the position labeled on the assembly drawing for C1. Be certain that the positive (+) end of the capacitor is oriented in the same direction as that shown on the drawing.

( ) Install two 220 MFD electrolytic capacitor in the position labeled on the assembly drawing for C2 and C3. Be certain that the positive (+) end of the capacitor is oriented in the same direction as that shown on the drawing.

INITIAL INSPECTION AND TESTING OF OP AMP POWER SUPPLY

( ) More details To Be added.

( ) Before connecting edge connectors, power on the op-amp power supply and check for approximately +18 and -18 volts between outs and ground.

WIRE EDGE CONNECTORS

It is best to connect all the wire leads to the edge connectors prior to installing the edge connectors into the chassis. With the edge connectors mounted in the bezel, but not mounted in the chassis, wire edge connector to edge connector connections. Then connect one end of the wire that will lead to the other components in the chassis, leaving enough loose wire to reach the connectors that they will eventually be connected to. The wirelist follows. All wires go to the bottom side of the edge connector. Abbreviations in the wirelist are as follows.

DB Digital board, the double wide PCB - there are two 22 position edge connectors associated with this board, named A and B.

AB Analog board, the single width PCB

BJ Banana Jack, there are five of these on the front panel labelled +5, X, Y Z, G, and one unlabelled which is GND.

TS Terminal Strip, there are four of these that are use to mount the components of the analog power supply.

P1 Port 1, amphenol connector on front of chassis

P2 Port 2, secondamphenol connector on front of chassis

	FROM	TO	REF DESIG
( )	DB-AA	BJ +5	+5
( )	DB-AC	TS3	GND
( )	DB-AD	P1-1	D0L
)	DB-AE	P1-4	D3L
( )	DB-AF	P1-2	D1L
( )	DB-AH	P1-3	D2L
(( )	DB-AJ	P1-6	D5L
( )	DB-AK	P1-5	D4L
( )	DB-AL	P1-8	D7L
( )	DB-AM	P1-7	D6L
( )	DB-BB	P1-9	SRB-1
( )	DB-BC	TS3	GND
( )	DB-BD	P2-9	SRB-2
( )	DB-BE	TS3	GND
( )	DB-BJ	AB-J	INIT
( )	DB-BK	AB-K	L4
( )	DB-BL	AB-L	L1
( )	DB-BM	AB-M	L2
( )	DB-BN	AB-N	L8
( )	DB-BR	AB-R	BLNK
( )	DB-BW	AB-Z	XP
( )	DB-BX	AB-X	YM
( )	DB-BY	AB-Y	YP
( )	DB-BZ	AB-W	XM
( )	AB-A	TS4 +18	+18
( )	AB-C	TS3	GND
( )	AB-E	TS4 -18	-18
( )	AB-H	BP-X	X OUT
( )	AB-T	BP-Z	Z OUT
( )	AB-U	BP-Y	Y OUT

MOUNT EDGE CONNECTORS

( ) Once all wires are connected to the edge connectors, you can mount the edge connectors to the chassis.

CONNECT EDGE CONNECTORS TO FRONT PANEL CONNECTORS

( ) You can now complete edge connector wiring by connecting dangling wires from the edge connectors to the connectors on the front panel.

FINAL TESTING

Details to be added. Final testing of the card must be done when the card is installed in the oscilloscope chassis and connected to a SCELBI minicomputer system.

SCELBI COMPUTER CONSULTING INC.

ASSEMBLY INSTRUCTIONS - SCELBI CARD #: 2102

AUDIO TAPE OUTPUT CARD

DESCRIPTION

The SCELBI #2102 audio output card is one part of a two card set that allows the user to utilize a low cost Audio tape cassette recorder as a peripheral device for storing programs or data for the SCELBI-8H mini-computer. The data or programs can then be reloaded back into the memory of a SCELBI-8H whenever desired. The system is about five times faster than a typical teletype paper tape System. It thus greatly increases the efficiency with which programs can be loaded into the computer, or saved for future use. The low cost of the unit makes it an extremely attractive addition to any SCELBI-8H mini-computer system.

KIT ASSEMBLY

You should refer to the assembly drawing shown on the next page during the assembly process. The drawing is to scale and shows the exact location of each part on the P.C. card.

INSTALLATION OF INTEGRATED CIRCUITS

( ) Install two type 7475 integrated circuits in the locations labeled on the assembly drawing as: Z1 & Z2. When they have been installed, turn the card over and solder the pins on the I.C. to their foil pad.

( ) Install five type 7493A integrated circuits at the locations specified for Z3, Z4, Z6, Z9 and Z13. Then solder the pins of the integrated circuits to the card foil.

( ) Install and solder one type 7496 integrated circuit at the location shown for Z5.

( ) Install and solder one type 7400 integrated circuits at the locations shown for Z7 and Z12.

( ) Install and solder one type 74121 integrated circuit at the location shown for Z8.

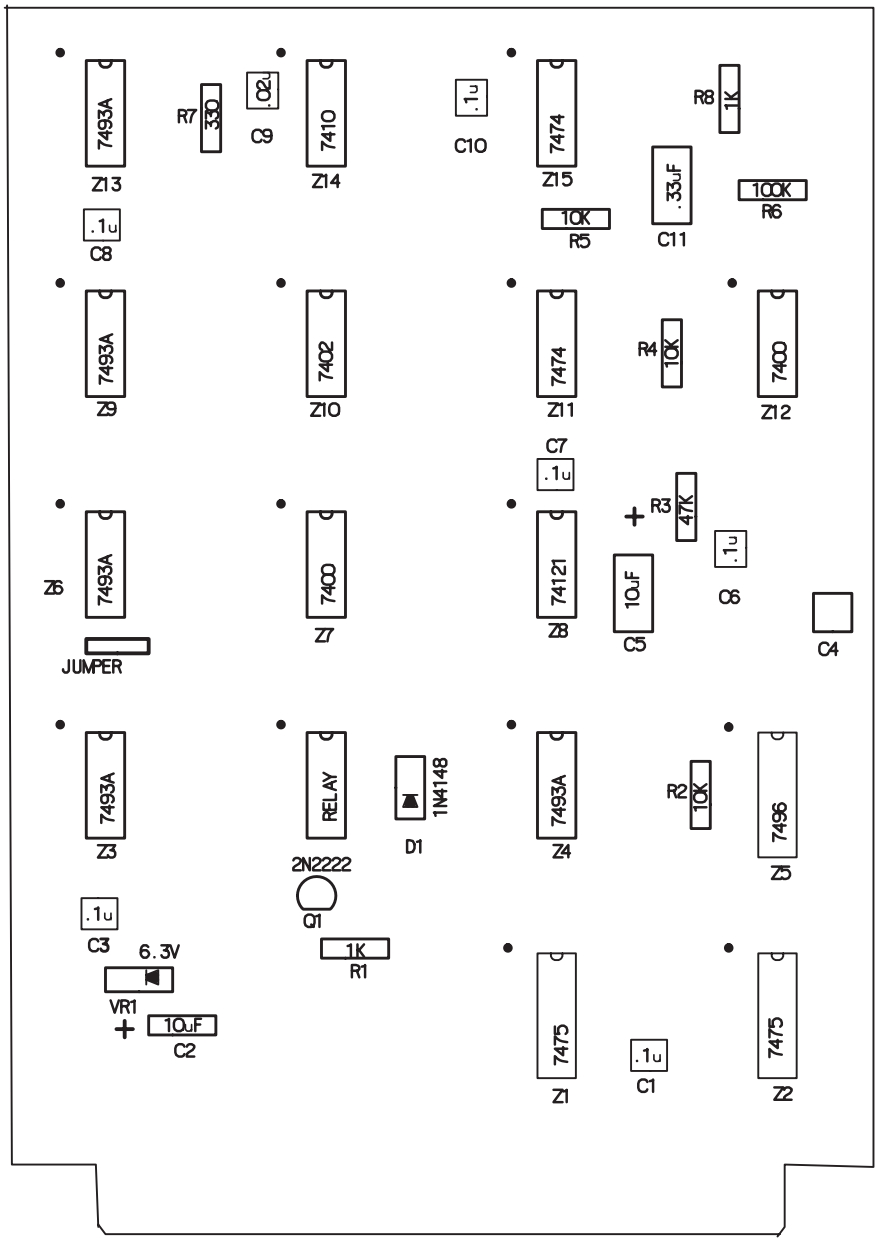
( ) Install and solder one type 7402 integrated circuit at the location shown for Z10.

( ) Install and solder two type 7474 integrated circuits at the locations shown for Z11 and Z15.

( ) Install and solder one type 7410 integrated circuit at the location shown for Z14.

INSTALLATION OF RELAY SOCKET

( ) Install and solder one 14 pin DIP socket at the location shown for RELAY.


7493A
Z13
R7
330
.02u
C9
7410
Z14
.1u
C10
7474
Z15
R8
1K
.33uF
C11
100K
R6
10K
R5
.1u
C8
7493A
Z9
7402
Z10
7474
Z11
R4
10K
7400
Z12
C7
.1u
7493A
Z6
7400
Z7
74121
Z8
R3
47K
10uF
C5
.1u
C6
C4
JUMPER
7493A
Z3
RELAY
1N4148
D1
2N2222
Q1
7493A
Z4
R2
10K
7496
Z5
.1u
C3
6.3V
VR1
1K
R1
10uF
C2
7475
Z1
.1u
C1
7475
Z2

INSTALLATION OF RESISTORS

( ) Install two 1K ohm (BRN-BLK-RED) 1/4 watt resistors at the locations shown on the assembly drawing for R1 and R8.

( ) Install three 10K ohm (BRN-BLK-ORN) 1/4 watt resistors at the locations shown on the assembly drawing for R2, R4 and R5.

( ) Install one 47K ohm (- - orange) 1/4 watt resistor at the location shown on the assembly drawing for R3.

( ) Install one 100K ohm (brown- black- yellow) 1/4 watt resistor at the location shown on the assembly drawing for R6.

( ) Install one 330 ohm (orange-orange-brown) 1/4 watt resistor at the location shown on the assembly drawing for R7.

INSTALLATION OF DIODES

( ) Install one 6.3 volt zener diode at the location shown for VR1. Be sure and observe correct polarity as indicated on the drawing.

( ) Install one 1N4148 diode at the location shown for D1. Be sure and observe correct polarity as indicated on the drawing.

INSTALLATION OF TRANSISTOR

( ) Install one 2N2222 transistor at the location shown for Q1. Be sure and observe correct orientation.

INSTALLATION OF CAPACITORS

( ) Install two 10 MFD electrolytic capacitors in the positions labeled on the assembly drawing for C2 and C5. Be certain that the positive (+) end of the capacitor is oriented in the same direction as that shown on the drawing and indicated on the P.C. card.

( ) Install six .1 UFD disk capacitors in the positions labeled on the assembly drawing as: C1, C3, C6, C7, C8 and C10.

( ) Install one .02 UFD disk capacitor at the location identified on the assembly drawing for C9.

( ) Install one .33uF film capacitor at the location identified on the assembly drawing for C11.

INSTALLATION OF RELAY

( ) Install one relay component at the location shown for RELAY. Be sure and observe correct orientation.

INSTALLATION OF FREQUENCY SELECT JUMPER

( ) Install a jumper wire between two pads labeled Jumper near location Z6.

INSTALLATION OF FUSE CLIPS

( ) Install the two P.C. Mounting fuse clips in the positions shown to hold fuse F1. Insert the two tabs on the base of each clip into the holes provided for each clip, bend the tabs slight against the foil on the other side of the board to hold them in place and then solder each tab to the foil. Ensure that the clips line up so that a fuse will seat properly when installed.

( ) Install a .75 ampere type 8AG fuse in the fuse clips for F1.

INITIAL INSPECTION AND TESTING

( ) At this time carefully inspect both sides of the board to ascertain that there are not any solder shorts between P.C. foil lands. Be especially observant on the component side of the card around the I.C. pins. Remove any solder shorts that are found.

( ) Use an ohm meter to make the following measurements:

Meter between pins A1 and A3 of the card connector - and then reverse the meter leads to obtain a second reading. The reading in both directions should be greater than five (5) ohms. (One reading will typically be several times higher than the other.) If the readings are less than five ohms look for solder shorts between the +5 volt supply lines and the common return lines on the card.

FINAL TESTING

Final testing of the card must be done when the card is connected to a SCELBI minicomputer system.

SCELBI COMPUTER CONSULTING1 INC.

ASSEMBLY INSTRUCTIONS - SCELBI CARD #: 2103-

AUDIO TAPE READ CARD

DESCRIPTION

The SCELBI #2103 audio input card is one part of a two card set that allows the user to utilize a low cost Audio tape cassette recorder as a peripheral device for storing programs or data for the SCELBI-8H mini-computer. The data or programs can then be reloaded back into the memory of a SCELBI-8H whenever desired. The system is about five times faster than a typical teletype paper tape System. It thus greatly increases the efficiency with which programs can be loaded into the computer, or saved for future use. The low cost of the unit makes it an extremely attractive addition to any SCELBI-8H mini-computer system.

KIT ASSEMBLY

You should refer to the assembly drawing shown on the next page during the assembly process. The drawing is to scale and shows the exact location of each part on the P.C. card.

INSTALLATION OF INTEGRATED CIRCUITS

( ) Install a type 7400 integrated circuit in the location labeled on the assembly drawing as Z5. When it has been installed, turn the card over and solder the pins on the I.C. to their foil pad.

( ) Install a type 7404 integrated circuit at the location specified for Z11. Then solder the pins of the I.C. to the card.

( ) Install and solder a type 7410 I.C. at the location shown for Z6.

( ) Install and solder eight type 74151 integrated circuits at the locations shown for: Z1, Z2, Z3, Z4, Z7, Z8, Z9 and Z10.

INSTALLATION OF RESISTORS

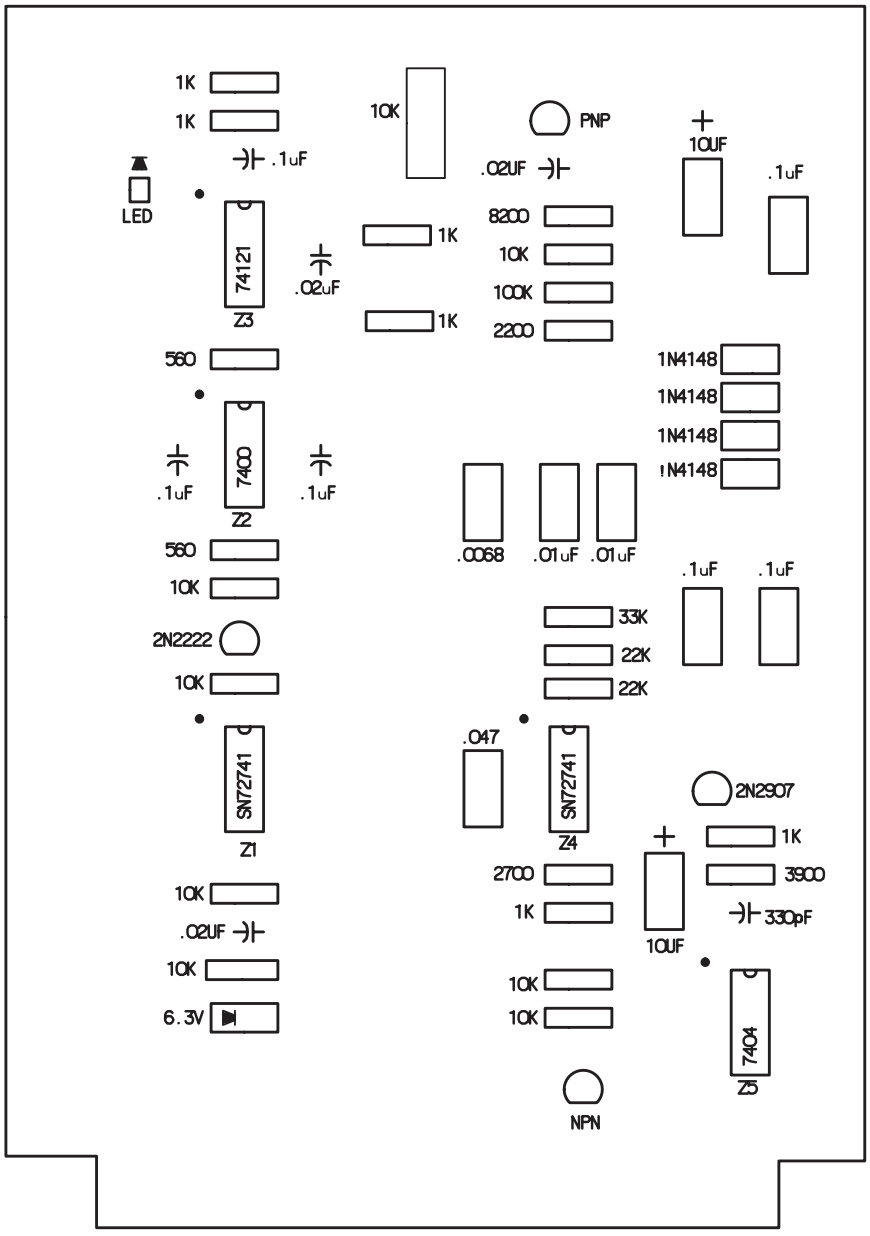
( ) Install sixty five 10 K ohm (BRN-BLK-OR) 1/4 watt resistors at the locations shown on the assembly drawing for R1 through R65.

INSTALLATION OF DIODES

( ) Install one 6.3 volt zener diode at the location shown for VR1. Be sure and observe correct polarity as indicated on the drawing.

INSTALLATION OF CAPACITORS

( ) Install one 10 MFD electrolytic capacitor in the position labeled on the drawing for C1. Be certain that the positive (+) end of the capacitor is oriented in the same direction as that shown on the drawing and indicated on the P.C. card.


1K
1K
.1uF
LED
74121
Z3
.02uF
560
7400
Z2
.1uF
.1uF
560
10K
2N2222
10K
SN72741
Z1
10K
.02UF
10K
6.3V
10K
1K
1K
PNP
.02UF
8200
10K
100K
2200
.0068
.01uF
.01uF
33K
22K
22K
.047
SN72741
Z4
2700
1K
10K
10K
NPN
10UF
.1uF
1N4148
1N4148
1N4148
!N4148
.1uF
.1uF
2N2907
1K
3900
330pF
10UF
7404
Z5

( ) Install two .1 UFD disk capacitors in the positions labeled on the assembly drawing as: C3 and C5.

( ) Install two .02 UFD disk capacitors in the positions labeled on the assembly drawing as: C2 and C4.

INSTALLATION OF FUSE CLIPS

( ) Install the two P.C. mounting fuse clips in the positions shown to hold fuse F1. Insert the two tabs on the base of each clip into the holes provided, bend the tabs slightly against the foil on the other side of the card to hold them in place and then solder each tab to the foil. Ensure that the clips line up so that a fuse will seat properly when installed.

INITIAL INSPECTION AND TESTING

( ) At this time carefully inspect both side of the board to ascertain that there are not any solder shorts between P.C. foil lands. Be especially observant on the component side of the card around the I.C. pins. Remove any solder shorts that are found.

( ) Install a 3/8 ampere type 8AG fuse in the fuse clips for F1.

( ) Use an ohm meter to make the following measurements:

Meter between pins A1 and A3 of the card connector - and the reverse the meter leads to obtain a second reading. The reading in both directions should be greater than five (5) ohms. (One reading will typically be several times higher than the other.) If the readings are less than five ohms look for solder shorts between the +5 volt supply lines and the common return lines on the card.

FINAL TESTING

Final testing of the card must be done when the card is installed in a SCEL-BI-8B minicomputer chassis unit.

THE SCELBI #1100 CPU CARD

The SCELBI #1100 CPU card is the primary module in a SCELBI-8B mini-comper. The card contains a "cpu-on-a-chip" (8008), a network of control and timing logic, and a master clock system. All computer operations in a SCELBI-8B emanate from and terminate at this card.

POWER REQUIREMENTS

+5 Volts: typically 500 MA., maximum 600 MA.

-9 Volts: typically 30 MA., maximum 60 MA.

OUTLINE OF CIRCUIT FUNCTIONS

A schematic of the SCELBI #1100 CPU card and a parts list are shown on the page following the discussion below, which provides a general outline of the fuctions of the circuits on the card.

Four type 74121 integrated circuits and associated components form a two phase 500 khz (plus/minus 2 %) clock which is provided to the 8008 cpu-on-a-chip. In addition, phase 2 of the clock is used to gate a number of devices in the logic network contained on the card.

A "SYNC" signal which has a frequency one half that of the master clock is obtained from the 8008 cpu-on-a-chip. It is buffered by inverters (Z10, Z12) and made available for distribution to the control logic on the card as well as to external devices which might require a high speed "clocking" signal.

CPU "states" from the 8008 are buffered (Z10 and Z12) and decoded by a 7442 decoder I.C. (Z4). The outputs of the decoder are fed to control logic on the card and are also made available to external devices.

The address/data bus from the 8008 is equipped with a "pull-up" switching network controlled by Ql (2n2907) which increases the switching speed of the bus (enough to use the faster 8008-1 CPU if desired.) The address/data bus is buffered by inverters (Z1 and Z10) for distribution to other card(s) in a SCELBI-8B system. When the bus is in the receive mode, data is accepted onto the bus V.I.A. integrated circuits (Z2 and Z3) which are enabled by a control signal from Z21.

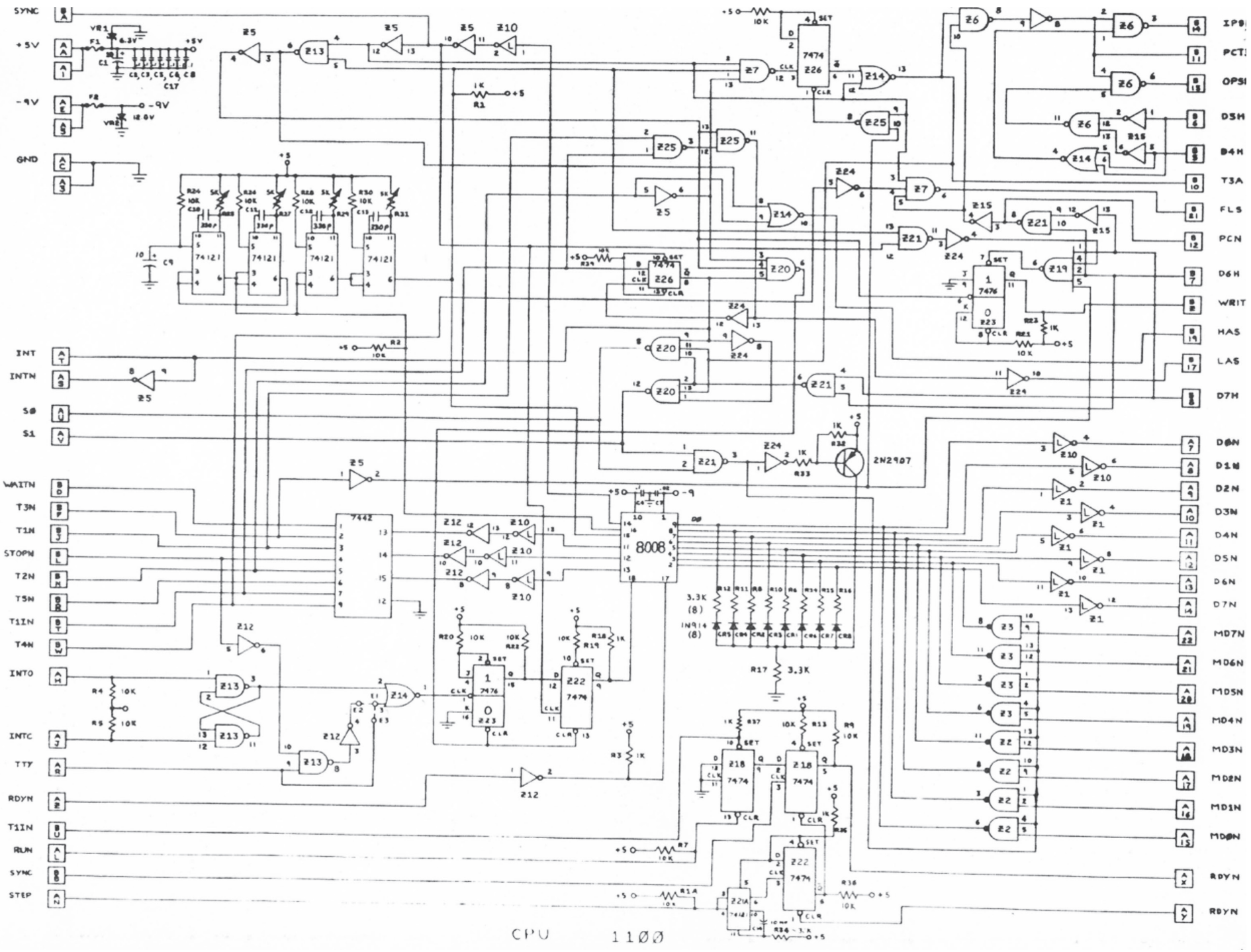
A network of logic (parts of Z12, Z13, Z14, Z22 and Z23) allows the CPU to be "interrupted" by an external signal. A strap option permits an interrupt to be accepted at any time, or else only when the CPU is in the "stop" state.

Another control signal to the 8008 CPU (RDYN) is buffered by Z12. This allows the CPU to be placed in a "wait" state if time is needed for an external device to provide data to the data bus of the CPU.

Integrated circuits Z18, Z21a, and part of Z22 are used to allow control of the computer through the use of a "step" mode, or to place the computer in the automatic "run' mode.

The remaiming logic is used to provide signals to external cards at specific times - such as providing “STROBE” signals to address latches and I/O multiplexers (such as those on the SCELBI type #1101 DBB & Output card,) controlling the read/write status of memory (Z19 and part of Z23,} and providing control signals for operation when in the “interrupt” mode.

While the SCELBI #1100 CPU card is specifically tailored for use in the SCELBI-8B mini-computer, it should be apparent that it is certainly not limited to that application. The card has been designed so that it can readily become an integral part of custom made computer/control systems of widely varying design and purpose. The SCELBI #1100 CPU card can be an economical solution for custom made “one of a kind” systems, and is also capable of serving in low cost high volume OEM applications.


SYNC
+5V
-9V
GND
INT
INTN
S0
S1
WAITN
T3N
T1N
STOPN
T2N
T5N
T1IN
T4N
INTO
INTC
TTY
RDYN
T1IN
RUN
SYNC
STEP
IP9
PCT
OPS
D5H
D4H
T3A
FLS
PCN
D6H
WRIT
HAS
LAS
D7H
D0N
D1N
D2N
D3N
D4N
D5N
D6N
D7N
MD7N
MD6N
MD5N
MD4N
MD3N
MD2N
MD1N
MD0N
RDYN
RDYN
8008
7442
7474
74121
2N2907
IN914
3.3K
10K
1K
CPU 1100

SCELBI COMPUTER CONSULTING. INC.

1100- CPU CARD PARTS LIST

QTY	DESCRIPTION	LOCATION(S)
4	7400 INTEGRATED CIRCUIT	Z6, Z13, Z21, Z25
1	7402 INTEGRATED CIRCUIT	Z14
2	7403 INTFGRATED CIRCUIT	Z2, Z3
4	7404 INTEGRATED CIRCUIT	Z5, Z12. Zl5, Z24
2	74L04 INTEGRATED CIRCUIT	Z1, ZI0
2	7410 INTEGRATED CIRCUIT	Z7, Z20
1	7420 INTEGRATFD CIRCUIT	Z19
1	7442 INTFGRATFD CIRCUIT	Z4
3	7474 INTEGRATED CIRCUIT	Z18, Z22, Z26
1	7476 INTEGRATED CIRCUIT	Z23
5	74121 INTEGRATED CIRCUIT	Z8, Z9, Z16, Z17, Z21A
1	8008 CPU I.C.	Z11
8	1K 1/4 W RESISTOR	R1, R3, R18, R23, R32, R33, R36 R37
9	3.3K 1/4 W RESISTOR	R6, R8, R10, Rll, R12, R14, R15, R16 R17
18	10K 1/4 W RESISTOR	R1A, R2, R4, R5, R7, R9, R13, R19 R20, R21, R22, R24, R26, R28 R30, R34, R35, R38, R39
1	33K 1/4 W RESISTOR	R34
4	5K TRIMPOTS	R25, R27, R29, R31
9	IN914 DIODES	CR1 - CR9
I	2N2907 TRANSISTOR	Q1
3	10 UFD ELECTROLYTIC CAP.	C1, C9, C14
7	.1 UF DISK CAPS	C2, C3, C4, C5, C6, C8, C17
I	.02 UF DISK CAP	C7
4	330 PF CAPACITORS	C10 - C13
1	6.3 VOLT ZENER DIODE	VR1

1	12.0 VOLT ZENER DIODE	VR2
1	3/4 AMP 8AG FUSE	F1
1	I/H AMP 8AG FUSE	F2
4	P.C. MOUNT FUSE CLIPS	
18	MOLEX PINS	
1	1100- PRINTED CKT CARD	

THE SCELBI #1101 DBB & OUTPUT CARD

The SCELBI #1101 DBB and Output card contains memory address and state control latches and logic for selecting banks of memory words. In addition, the card contains multiplexing logic that provides select strobe signals for up to 16 output ports.

POWER REQUIREMENTS

+5 volts: typically 650 MA., maximum 750 MA.

OUTLINE OF CIRCUIT FUNCTIONS

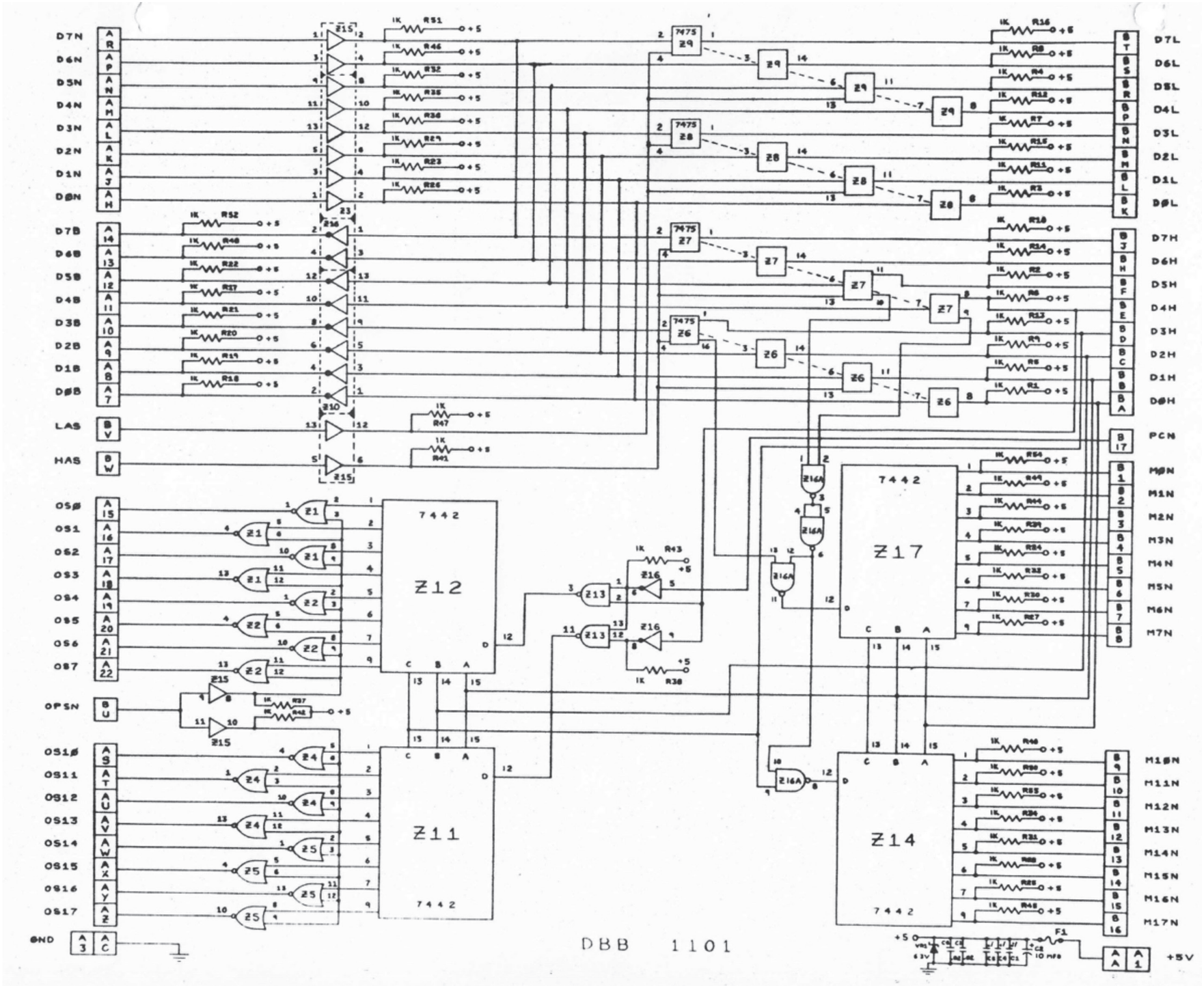
Integrated circuits Z3 and part of Z15 provide buffering of the address/data bus and deliver these signals to the high and low address latches (Z6 & Z7 and Z8 & Z9.) In addition, the buffered data is fed to Z10 and part of Z16 which act as data bus drivers to deliver the signals to external devices.

Part of I.C. Z15 passes the low and high address strobe signals to the address latches.

Information from the high address latches is picked up by Z16A and passed to decoding circuits (Z14 and Z17) to provide memory enable signals for pages 00 through 17 (octal). (These signals are not normally used in a standard SCELBI-8B.)

Information from the high address latches is also passed through a network (Z1, Z2, Z4, Z5, Z11, Z12 and Z13 plus part of Z16) that provides an output port select strobe when an output instruction is being executed and the appropriate "open" signal is received on pin 'BU' of the card and passed through the "open" buffer (part of Z15).

The lines D5H throngh D0H are passed to the memory expander card in a SCELBI-8B system for use in selecting memory "pages."


D7N
D6N
D5N
D4N
D3N
D2N
D1N
DØN
D7B
D6B
D5B
D4B
D3B
D2B
D1B
DØB
LAS
HAS
OSØ
OS1
OS2
OS3
OS4
OS5
OS6
OS7
OPSN
OS1Ø
OS11
OS12
OS13
OS14
OS15
OS16
OS17
GND
Z12
Z11
Z17
Z14
7442
7475
D7L
D6L
D5L
D4L
D3L
D2L
D1L
DØL
D7H
D6H
D5H
D4H
D3H
D2H
D1H
DØH
PCN
MØN
M1N
M2N
M3N
M4N
M5N
M6N
M7N
M1ØN
M11N
M12N
M13N
M14N
M15N
M16N
M17N
+5V
DBB 1101

SCELBI COMPUTER CONSULTING, INC.

1101- DBB & OUTPUT CARD PARTS LIST

QTY	DESCRIPTION	LOCATION(S)
2	7400 INTEGRATED CIRCUIT	Zl3, Z16A
4	7402 INTEGRATFD CIRCUIT	Z1, Z2, Z4, Z5
?	7416 INTEGRATFD CIRCUIT	Z10, Zl6
2	7417 INTEGRATFD CIRCUIT	Z3, Z15
4	7442 INTEGRATFD CIRCUIT	Z11, Zl2, Z14, Z17
4	7475 INTEGRATED CIRCUIT	Z6 - Z9
54	1K 1/4 W RESISTOR	R1 - R52, R54, R55
1	10 UFD ELECTROLYTIC CAP	C2
3	.1 UFD DISK CAP	C1, C4, C5
2	.02 UFD DISK CAP	C3, C6
1	6.3 VOLT ZENER DIODE	VRI
1	1.0 AMP 8AG FUSE	F1
2	P.C. MOUNT FUSE CLIPS	
1	1101- PRINTED CKT CARD	

THE SCELBI #1102 INPUT CARD

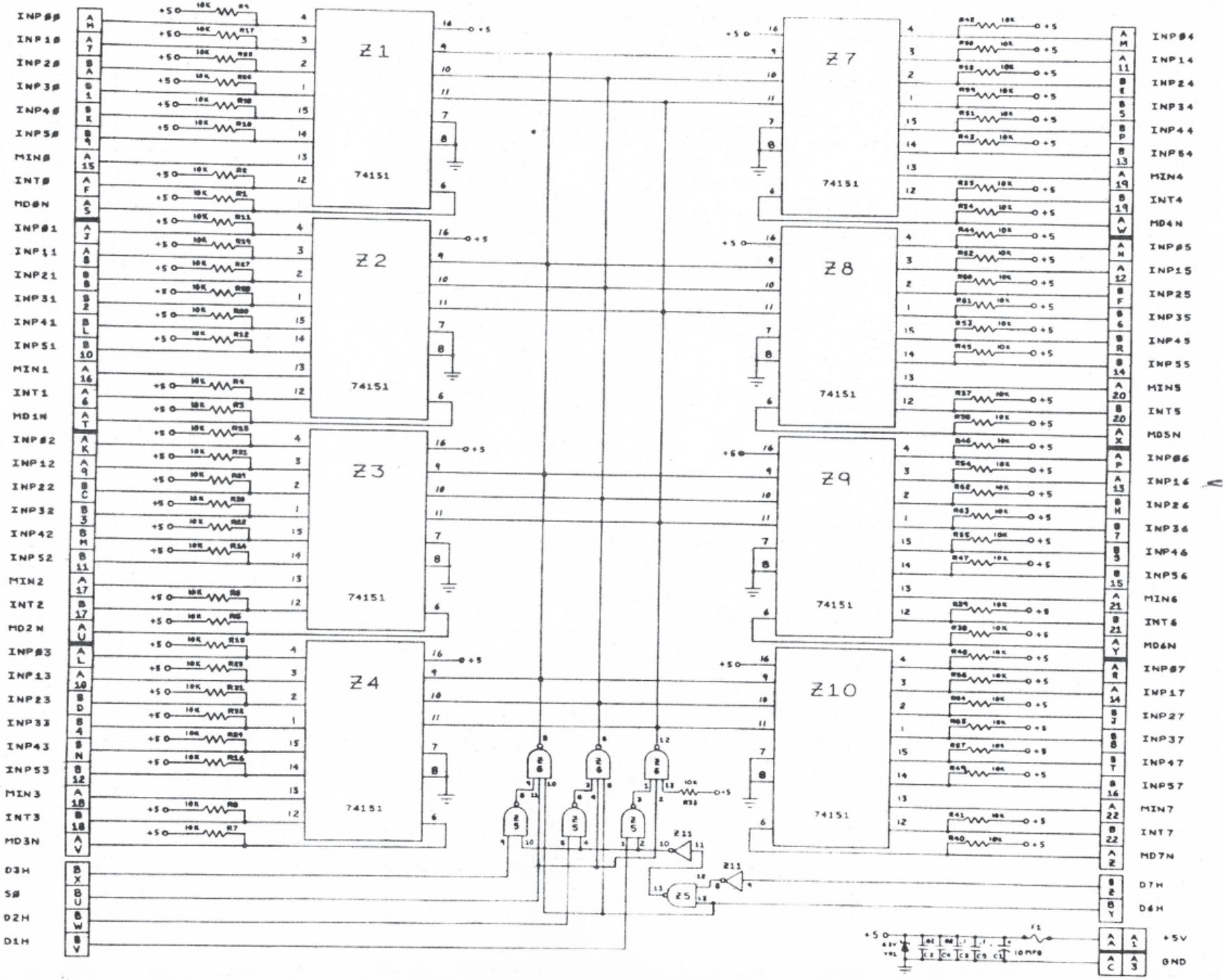
The SCELBI #1102 input card contains multiplexing logic which selects the input to the central processor card (scelbi #ll00.) The card allows input to the cpu in a SCELBI-8B mini-computer to arrive from the memory bank(s), the chassis console switches (which are used to allow control of the computer by an operator) or any one of six different input ports.

POWER REQUIREMENTS

+5 volts: typically 250 MA., maximum 300 MA.

OUTLINE OF CIRCUIT FUNCTIONS

Integrated circuits Z5, Z6 and Z11 take control signals received from the SCELBI #1100 (CPU card) and #1101 (DBB & output card) in a SCELBI-8B mini-computer and pass them onto multiplexing integrated circuits (Z1 - Z4 and Z7 - Z10). The multiplexing circuits select one input line (out of eight) and passes the selected signal on to the CPU card in a SCELBI-8B system. The multiplexing arrangements allows any one of six input ports (ports 0 through 5) to be selected, or for data to be received from the memory bank(s), or from an external source when the computer is in the interrupt mode (such as the chassis console switchs on a SCELBI-8B mini-computer.) It should be noted, that while the “INT” (interrupt mode) data lines are used to accept data from the chassis switches in a standard SCELBI-8B, these lines could be used to accept data from other electronic devices for achieving highly sophisticated automatic operation in special systems (such as machine controllers) by having external electronics deliver instruction codes through these line when the computer is in the “interrupt” mode.


INP00
INP10
INP20
INP30
INP40
INP50
MIN0
INT0
MD0N
INP01
INP11
INP21
INP31
INP41
INP51
MIN1
INT1
MD1N
INP02
INP12
INP22
INP32
INP42
INP52
MIN2
INT2
MD2N
INP03
INP13
INP23
INP33
INP43
INP53
MIN3
INT3
MD3N
D3H
S0
D2H
D1H
Z1
Z2
Z3
Z4
Z5
Z7
Z8
Z9
Z10
Z11
74151
INP04
INP14
INP24
INP34
INP44
INP54
MIN4
INT4
MD4N
INP05
INP15
INP25
INP35
INP45
INP55
MIN5
INT5
MD5N
INP06
INP16
INP26
INP36
INP46
INP56
MIN6
INT6
MD6N
INP07
INP17
INP27
INP37
INP47
INP57
MIN7
INT7
MD7N
D7H
D6H
+5V
GND

SCELBI COMPUTER CONSULTING, INC.

1102- INPUT CARD PARTS LIST

QTY	DESCRIPTION	LOCATION(S)
1	7400 INTEGRATED CIRCUIT	Z5
1	7404 INTEGRATED CIRCUIT	Z11
1	7410 INTEGRATED CIRCUIT	Z6
8	74151 INTEGRATED CIRCUIT	Z1 - Z4, Z7 - Z10
65	10K 1/4 W RESISTORS	R2 - R65
1	10 UFD ELECTROLYTIC CAP	C1
2	.1 UFD DISK CAPACITOR	C3, C5
2	.02 UFD DISK CAPACITOR	C2, C4
1	6.3 VOLT ZENER DIODE	VR1
1	3/8 AMP 8AG FUSE	Fl
2	P.C. MOUNT FUSE CLIPS	
1	1102- PRINTED CIRCUIT CARD	

THE SELBI #1104 FRONT PANEL CARD

~HE SeELBI '1104 front panel card has bfen specially designed to allow a scelbi-bb user to monitor the operation of a ~celbi-8b mini¬computer. The card contains an array of long lasting solid state light emitting diodes which alloy the operator to display the contents of memory locations, the contents of internal cpu registers, major cycle states of the computer, and the general status of the system including the presence of power supply voltages.

POWER REQUIREMENT

+5 volts, typically 200 MA., maximum 250 MA.

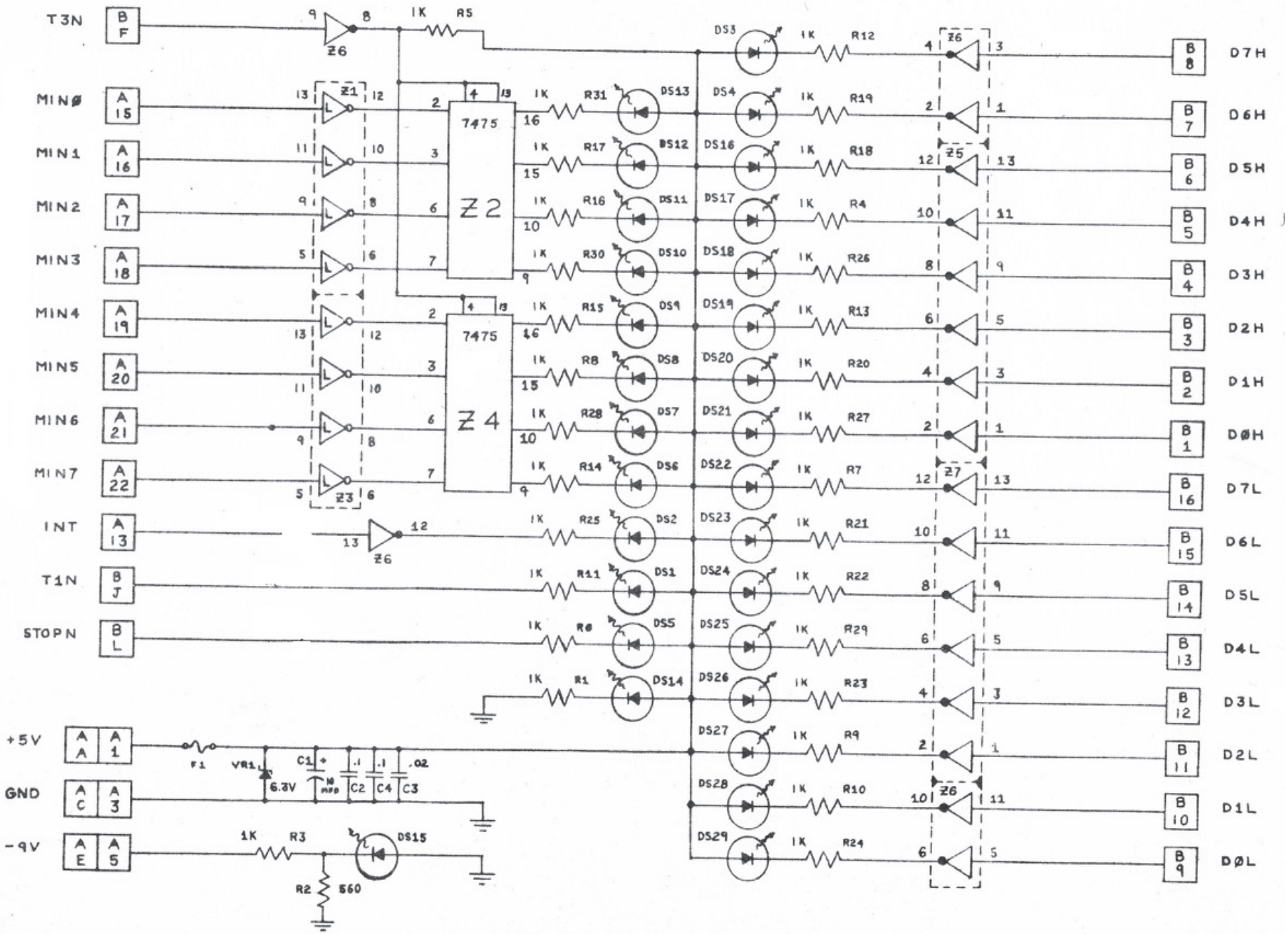
-9 volts: - - - - - - maximum 10 MA.

OUTLINE OF CIRCUIT FUNCTIONS

Integrated circuits Z1 and Z3 buffer data obtained from the data out lines of the memory elements and pass them to latches (Z2 and Z4) that drive the "memory contents" display lamps.

Buffers (Z5, parts of Z6 and Z7) monitor the memory address signals (obtained from the SCELBI #1101 DBB & output card) and drive the memory address display lamps. The two high order bits of the memory address signals actually represent cycle conditions of the 8008 CPU (on the SEELBI #1100 CPU card) and these are also displayed (lamps DS3 and DS4.)

Other lamps monitor the +5 volt and -9 volt supplies, and several of the CPU "state" lines are monitored to display the general condition of the computer - such as whether the machine is in the "run," "stop," or "interupt" mode (DS1, DS2 and DS5.)


T3N
MIN0
MIN1
MIN2
MIN3
MIN4
MIN5
MIN6
MIN7
INT
T1N
STOPN
+5V
GND
-9V
7475
Z2
Z4
Z1
Z3
Z5
Z6
Z7
DS1
DS2
DS4
DS5
DS6
DS7
DS8
DS9
DS10
DS11
DS12
DS13
DS14
DS15
DS16
DS17
DS18
DS19
DS20
DS21
DS22
DS23
DS24
DS25
DS26
DS27
DS28
DS29
D7H
D6H
D5H
D4H
D3H
D2H
D1H
D0H
D7L
D6L
D5L
D4L
D3L
D2L
D1L
D0L
1K
6.8V
560

SCELBI COMPUTER CONSULTING, INC.

1104- FRONT PANEL CARD PARTS LIST

QTY	DESCRIPTION	LOCATION(S)
2	74L04 INTEGRATED CIRCUIT	Z1, Z3
3	7416 INTEGRATED CIRCUIT	Z5 - Z7
2	7475 INTEGRATED CIRCUIT	Z2, Z4
1	560 OHM 1/4 W RESISTOR	R2
30	1K 1/4 W RESISTOR	Rl, R3 - R31
29	MV10B L.E.D.	DSl - 0529
1	6.3 VOLT ZENER DIODE	VR1
1	10 UFD ELECTROLYTIC CAP	C1
2	.1 UFD DISK CAP	C2, C4
1	.02 {UFD DISK CAP	C3
1	3/8 AMP 8AG FUSE	F1
2	P.C. MOUNT FUSE CLIPS	
1	1104- PRINTED CIRCUIT CARD	

THE SCELB I #1106 MEMORY EXPANSION CARD

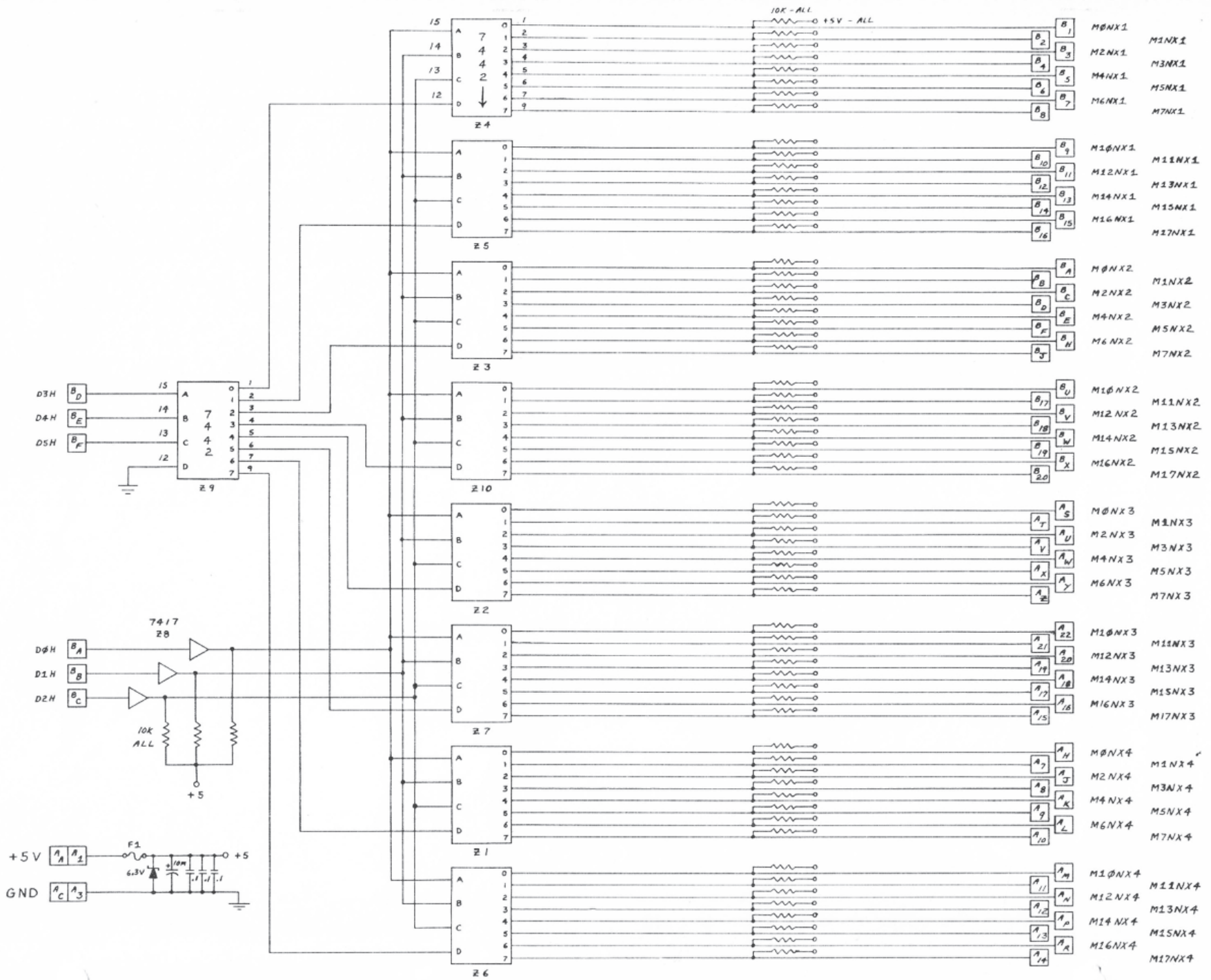
The SCELBI #1106 memory expansion card contains memory address logic which enables the computer to select the desired "page" of memory in a system that may contain many "pages" or "banks" of memory elements.

POWER REQUIREMENTS

+5 volts. typically 200 MA. maximum 250 MA.

OUTLINE OF CIRCUIT FUNCTIONS

Integrated circuits Z8 and Z9 accepts signals from the high address latches provided by the #1101 DBB & output card. These signals are then decoded by integrated circuits Z1 - Z7 and Z10 to provide one memory page select signal out of a possible sixty four. The page select signal for the desired bank of memory elements is "true" when the signal outputted from the card is in the logic "low" (0) condition. The outputs from the card are fed to the mfmory card slots 1m a SCELBI-8B system.


10K - ALL
+5V - ALL
7442
Z4
Z5
Z3
Z10
Z2
Z7
Z1
Z6
Z9
7417
Z8
D3H
D4H
D5H
D0H
D1H
D2H
10K ALL
+5
+5V
GND
F1
6.3V
M0NX1
M1NX1
M2NX1
M3NX1
M4NX1
M5NX1
M6NX1
M7NX1
M10NX1
M11NX1
M12NX1
M13NX1
M14NX1
M15NX1
M16NX1
M17NX1
M0NX2
M1NX2
M2NX2
M3NX2
M4NX2
M5NX2
M6NX2
M7NX2
M10NX2
M11NX2
M12NX2
M13NX2
M14NX2
M15NX2
M16NX2
M17NX2
M0NX3
M1NX3
M2NX3
M3NX3
M4NX3
M5NX3
M6NX3
M7NX3
M10NX3
M11NX3
M12NX3
M13NX3
M14NX3
M15NX3
M16NX3
M17NX3
M0NX4
M1NX4
M2NX4
M3NX4
M4NX4
M5NX4
M6NX4
M7NX4
M10NX4
M11NX4
M12NX4
M13NX4
M14NX4
M15NX4
M16NX4
M17NX4

SCELBI COMPUTER CONSULTING, INC.

1106- MEMORY EXPANSION CARD PARTS LIST

QTY	DESCRIPTION	LOCATION(S)
1	7417 INTEGRATED CIRCUIT	Z8
9	7442 INTEGRATED CIRCUIT	Z1 - Z7, Z9 & Z10
67	10K 1/4 W RESISTOR	R1 - R67
1	10 UFD ELECTROLYTIC. CAP	C1
3	.1 UF DISK CAP	C2 - C4
1	6.3 VOLT ZENER DIODE	VR1
1	1.5 AMP 8AG FUSE	F1
2	P.C. MOUNT FUSE CLIPS	
1	1106- PRINTED CKT CARD	

THE SCELBI #1107 RAM MEMORY CARD

The SCELBI #1197 RAM memory card may be populated with type 2102 (Static RAM) memory elements in groups of 1,024 words to a maximum of 4,096 words per card. The card also contains memory bank selection logic. These cards serve as the read and write memory bank(s) for a SCELBI-8B system. The standard SCELBI-8B chassis has P.C. card sockets to accept of up four of these cards allowing for up to 16,384 words of memory to be used by the computer.

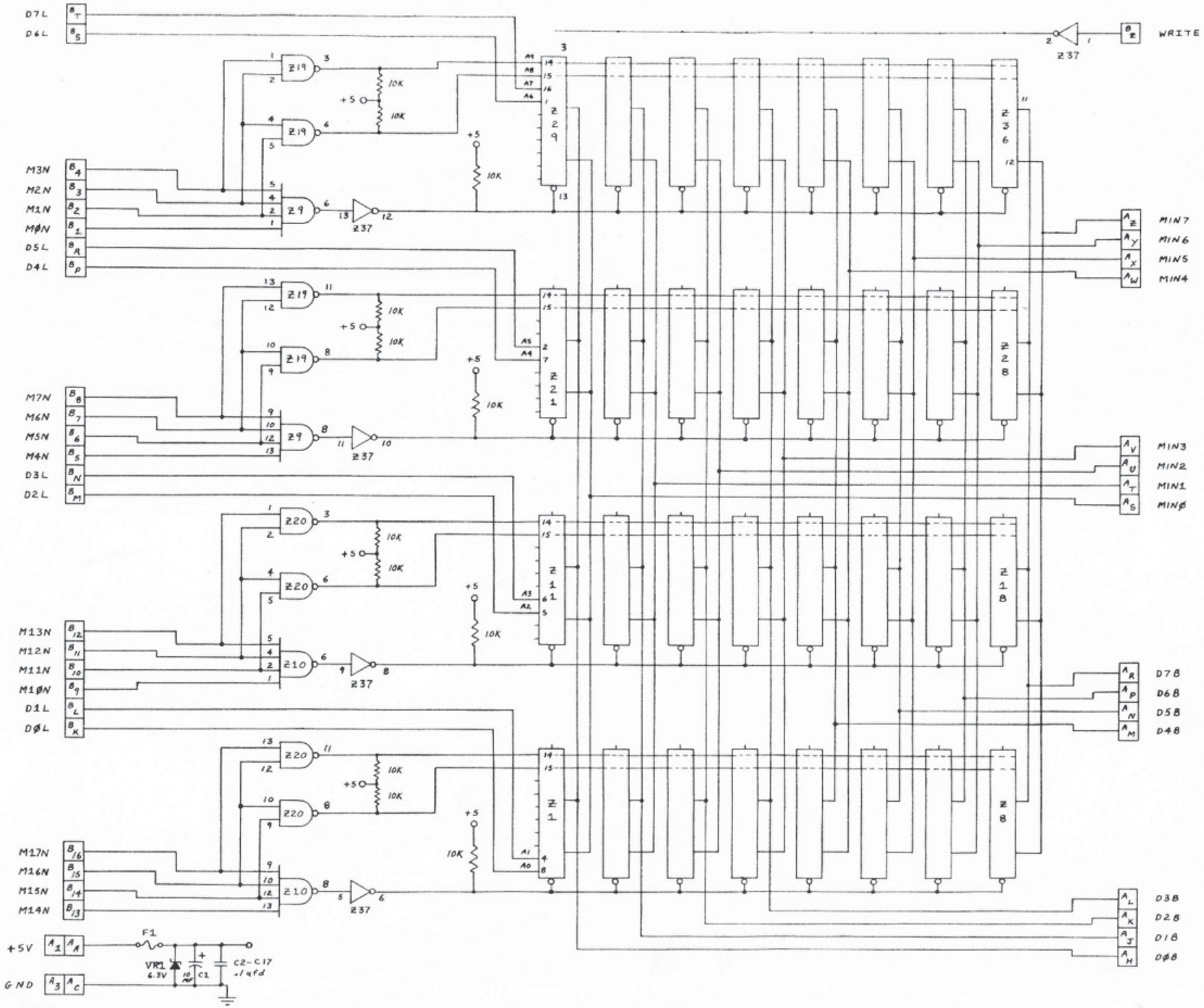
POWER REQUIREMENT

+5 volt. typically 600 MA., maximum 1.0 AMP

OUTLINE OF CIRCUIT FUNCTIONS

The card may contain up to 32 type 2102 static RAM memory integratfd circuits. Each I.C. serves to hold 1 bit of information at each address location in a block of 1,024 addresses. Therefore, eight of these devices in parallel provide 1,024 full eight bit words of memory for a SCELBI-8B mini-computer. These I.C.s may be added to the card in groups of eight to provide the card with 1,024, 2,048, 3,072 or 4,096 words of RAM memory.

Integrated circuits Z9, Z10, Z19, Z20 and Z37 serve to decode the “page” address information received from the SCELBI #1106 memory expansion card and set the high order address bits of a selected row of 2102 I.C.s to select a block of 256 words (page) out of the possible 1,024 words that are contained in a group. In addition, the logic selects the appropriate row of memory elements out of the four possible rows on a card. The low order portion of the address is received directly from the low order address lines provided by the SCELBI #1101 DBB & output card. Enabling an individual word out of a group of 256 words on a selected “page” to be accessed.


D7L
D6L
M3N
M2N
M1N
MØN
D5L
D4L
M7N
M6N
M5N
M4N
D3L
D2L
M13N
M12N
M11N
M1ØN
D1L
DØL
M17N
M16N
M15N
M14N
+5V
GND
F1
VR1
6.3V
C1
C2-C17
.1 µfd
Z19
Z20
Z9
Z10
Z37
10K
+5
WRITE
MIN7
MIN6
MIN5
MIN4
MIN3
MIN2
MIN1
MINØ
D78
D68
D58
D48
D38
D28
D18
DØ8

SCELBI COMPUTER CONSULTING, INC.

1107- RAM MEMORY CARD PARTS LIST

QTT	DESCRIPTION	LOCATION(S)
2	7400 INTEGRATED CIRCUIT	Z19, Z20
1	7404 INTEGRATED CIRCUIT	Z37
2	7420 INTEGRATED CIRCUIT	Z9. ZI0
32	2102 1K STATIC RAM I.C.	Z1 - Z8, Z11-Z18. Z21 - Z28 Z29 - Z36
12	10K 1/4 W RESISTOR	RI - R12
1	10 UFD ELECTROLYTIC CAP	C1
16	.1 UF DISK CAP	C2 - Cl7
1	6.3 VOLT ZENER DIODE	VR1
2	1.5 AMP 8AG FUSE	F1, F2
4	P.C. MOUNT FUSE CLIPS	
1	1187- PRINTED CKT CARD	

THE SCELB I #1109 ROM/PROM MEMORY CARD

The SCELBI #1109 ROM/PROM memory card is an optional capd. The card may be populated with up to 16 type: 1602 ROMs or 1702 PROMs. At 256 words per ROM, this allows up to 4,096 Words of ROM memory to be stored on each card. The card may be plugged into any memory card slot in a SCELBI-8B system to substitute ROM/PROM memory for RAM memory.

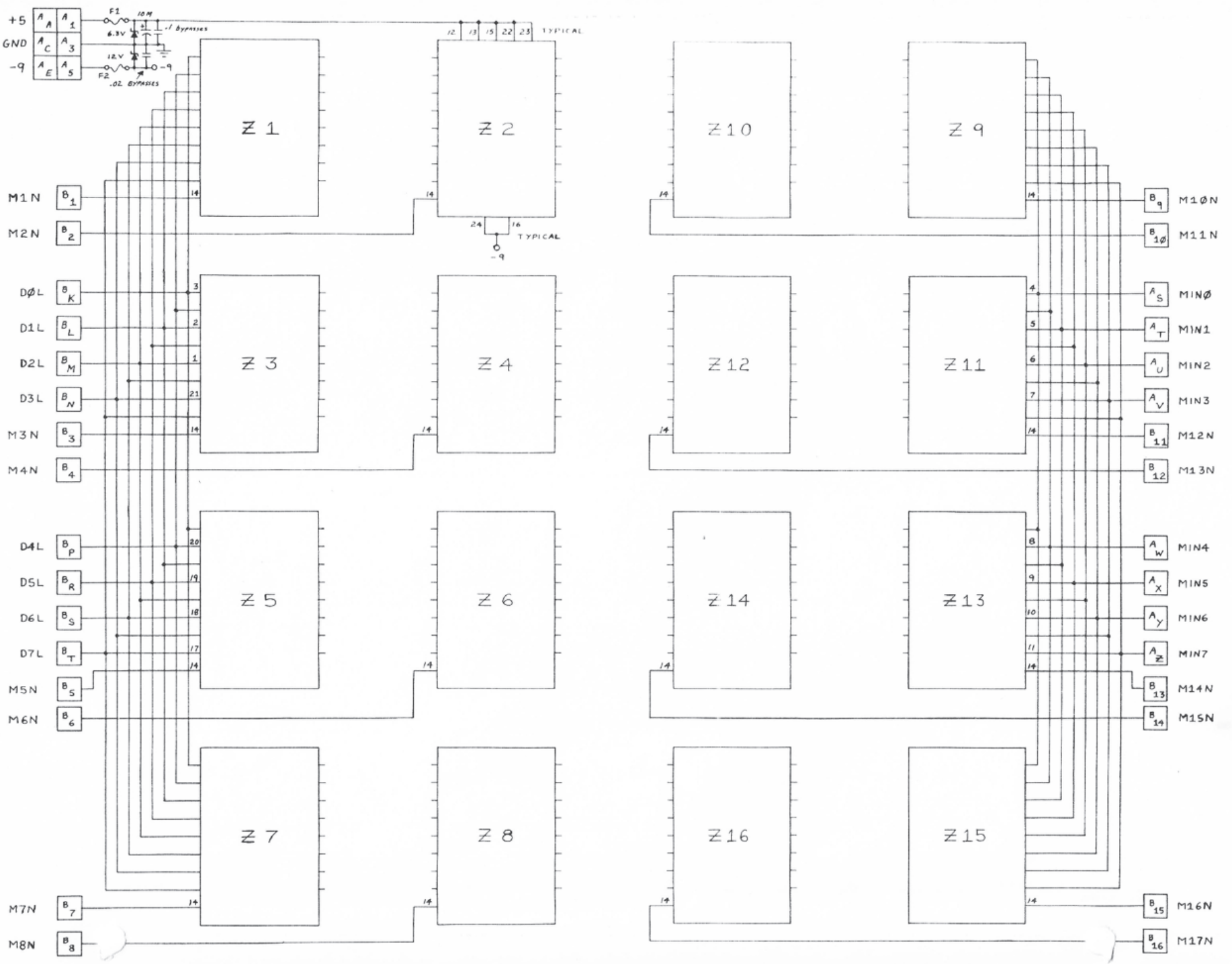
POWER REQUIREMENTS

+5 volts: typically 1.0 AMP., maximum 1.5 AMP.

-9 volts: typically 1.0 AMP., maximum 1.5 AMP.

OUTLINE OF CIRCUIT FUNCTIONS

Thf card holds up to 16 individual ROM/PROM devices. Each device is a self contained unit holding 256 eight bit words of read only memory. An individual device is selected by activation of an appropriate memory address page select line provided by the SCELBI #1106 memory expansion card. The address within a device is selected by the information on the low address lines provided by the SCELBI #1101 DBB & output card.


+5
GND
-9
F1
6.3V
10M
.1 BYPASSES
12V
F2
.02 BYPASSES
12 13 15 22 23 TYPICAL
24 16 TYPICAL
Z 1
Z 2
Z 3
Z 4
Z 5
Z 6
Z 7
Z 8
Z 9
Z 10
Z 11
Z 12
Z 13
Z 14
Z 15
Z 16
M1N
M2N
M3N
M4N
M5N
M6N
M7N
M8N
DØL
D1L
D2L
D3L
D4L
D5L
D6L
D7L
M1ØN
M11N
M12N
M13N
M14N
M15N
M16N
M17N
MINØ
MIN1
MIN2
MIN3
MIN4
MIN5
MIN6
MIN7

SCELBI COMPUTER CONSULTING, INC.

1109- ROM/PROM CARD PARTS LIST

QTY	DESCRIPTION	LOCATION(S)
16	1602 ROM OR 1702 PROM I.C.	Z1 - Zl6
16	24 PIN I.C. SOCKET	SK1 - SK16
1	10 UFD ELECTROLYTIC CAP	Cl
4	.1 UF DISK CAP	C3, C5, C7, C9
4	.02 CF DISK CAP	C2, C4, C6, C8
1	6.3 VOLT ZENER DIODE	VR1
1	12 VOLT ZENER DIODE	VR2
2	1.5 AMP 8AG FUSE	F1, F2
4	P.C. MOUNT FUSE CLlPS	
1	1109- PRINTED CKT CARD	