

NOTE: All mods involving grounding should be 20 gauge solid, insulated wire. All mods involving signal paths should be no greater than 26 gauge and no less than 30 gauge insulated wire.

## Sol

REV D to E

The following is a complete list of changes necessary to modify a Revision D Sol to a Revision E Sol. These changes are illustrated in Figures A & B for your convenience:

### 1. CLOCK WIDTH FIX: -----

On component side of Sol PCB, cut the trace between jumpers D and E (U90 and U91) of the clock generator. On the solder side of the PCB, connect a jumper from pin E to the feedthrough which leads to U91 pin 5. This brings PHASE 1 into 8080 spec at 140 ns rather than 70 ns without this mod.

### 2. PHANTOM GLITCH FIX: -----

On the solder side of the PCB, connect a jumper from U76 pin 4 to the feedthrough immediately below U76 pin 1. This assures the Sol will always power up with 4 PHANTOM cycles.

### 3. GROUND NOISE FIX: -----

On the solder side of the PCB, jumper pin 8 of U33, U50, U68 and U81 to the ground feedthrough leading to C45. Use 20 gauge insulated solid wire and keep the leads as short as possible. The fix shortens the return path to ground from the bus drivers. On occasion the present return path can be quite noisy.

### 4. PROTECT FIX: -----

On the solder side of the PCB, connect a jumper from the ground side of C11 to pin 70 of the 100-pin bus connector J11. This will ground the PROTECT line which is currently floating. Again, use 20 gauge insulated solid wire.

✓5. DMA/INTERRUPT UNSCRAMBLE:  
-----

On the component side of the PCB, cut the trace leading to pin 73 of J11 (S100 connector). Cut the trace leading to pin 1 of U45 on the solder side of the PCB. Also on the solder side, cut the second trace to the right of U64.

Jumper pin 73 of J11 to pin 1 of U45. Jumper from pin 28 of J11 to the feedthrough which formerly led to pin 73 of J11 before the trace was cut. Jumper the feedthrough directly below pin 1 of U45 to the feedthrough to the right of U64 pin 3. This fix will allow the Sol to be used with DMA devices. Helios II, and other DMA devices will not work without this fix.

✓6. MWRITE FIX:  
-----

On the solder side of the PCB, cut the trace leading to pin 7 of U93. On the solder side, cut the trace leading to the feedthrough immediately below pin 1 of U92. DO NOT CUT THE TRACE LEADING TO U92 PIN 1!! Connect a jumper from this feedthrough to pin 13 of U107.

On the solder side, jumper the feedthrough leading to U94 pin 9 to the trace which formerly led to U94 pin 7 before the trace cut. This fix decodes the MWRITE signal from SOUT and PWR even when a DMA device has disabled the Status Drivers. This is especially important to memory boards which require MWRITE and do not decode PWR and SOUT internally and DMA devices (such as Helios) which do not supply their own MWRITE to the bus.

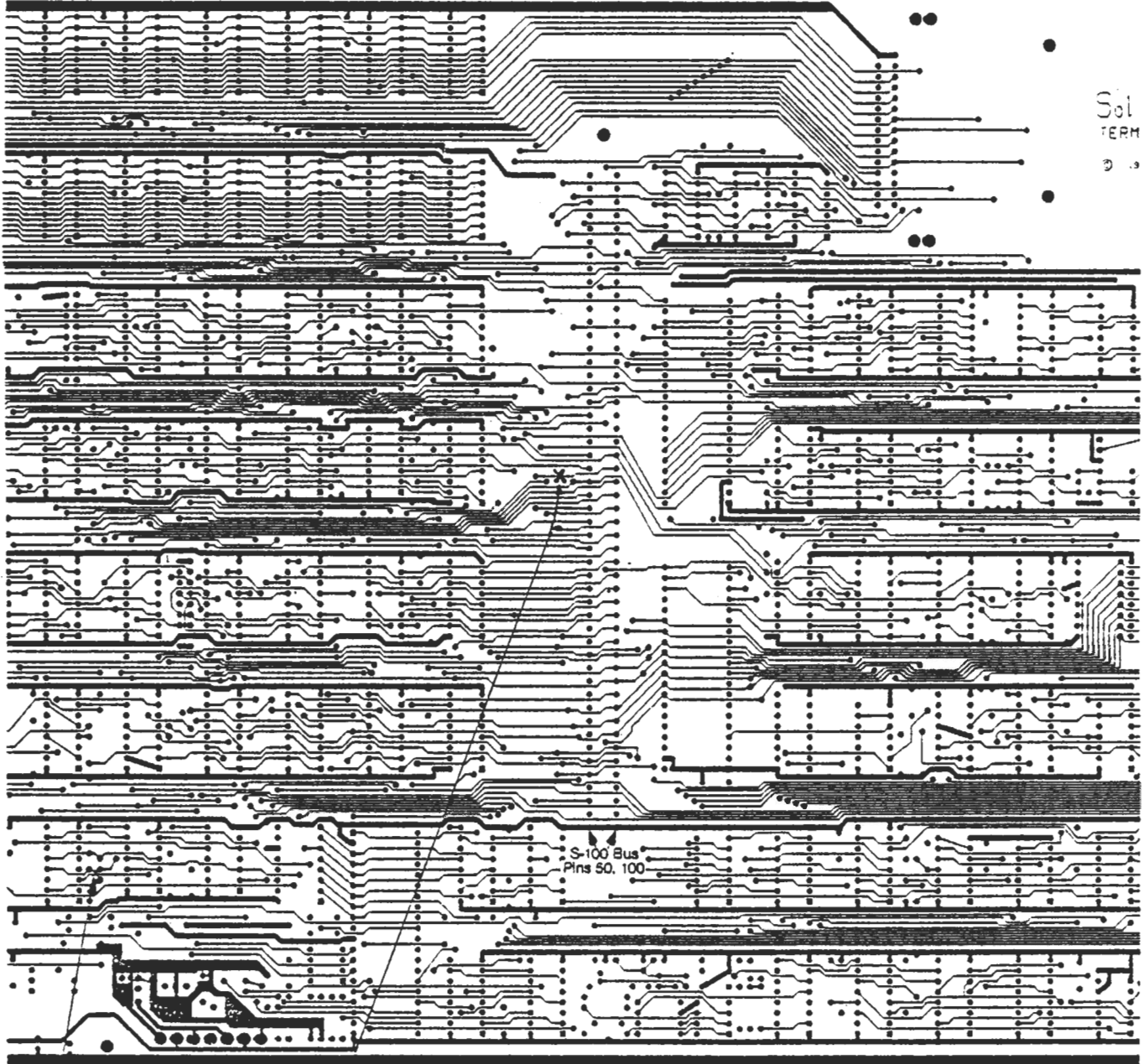
✓7. CURRENT LOOP FIX:  
-----

Cut the large trace which leads to R23 and R24 on the solder side of the PCB. Connect the now isolated end of R23 to the +12 Volt feedthrough as shown in Figure B.

8. CASSETTE RELAY FIX:  
-----

On component side of Sol PCB, cut the trace leading to the hot lead of J9. On the solder side connect a 6.8 ohm, 1/4 watt (5%) resistor between the hot pin of J9 and cathode (banded end) of D14. Also on the solder side, cut the trace leading to the hot pin of J8 to the feedthrough isolated by the trace cut. This change is adding a series resistance to the cassette drive jack to limit the amount of current drawn by the cassette motor from the reed relays. Certain models of cassettes might draw excessive current and burn out the relays without this fix.

NOTE: These changes were elaborated in Issues 2 and 3 of ACCESS.  
(April and June of 1977)



Sol  
TERM  
2 3

S-100 Bus  
Pins 50, 100

PROCESSOR TECHNOLOGY  
COMPONENT SIDE  
P-ART-5 9-1-76

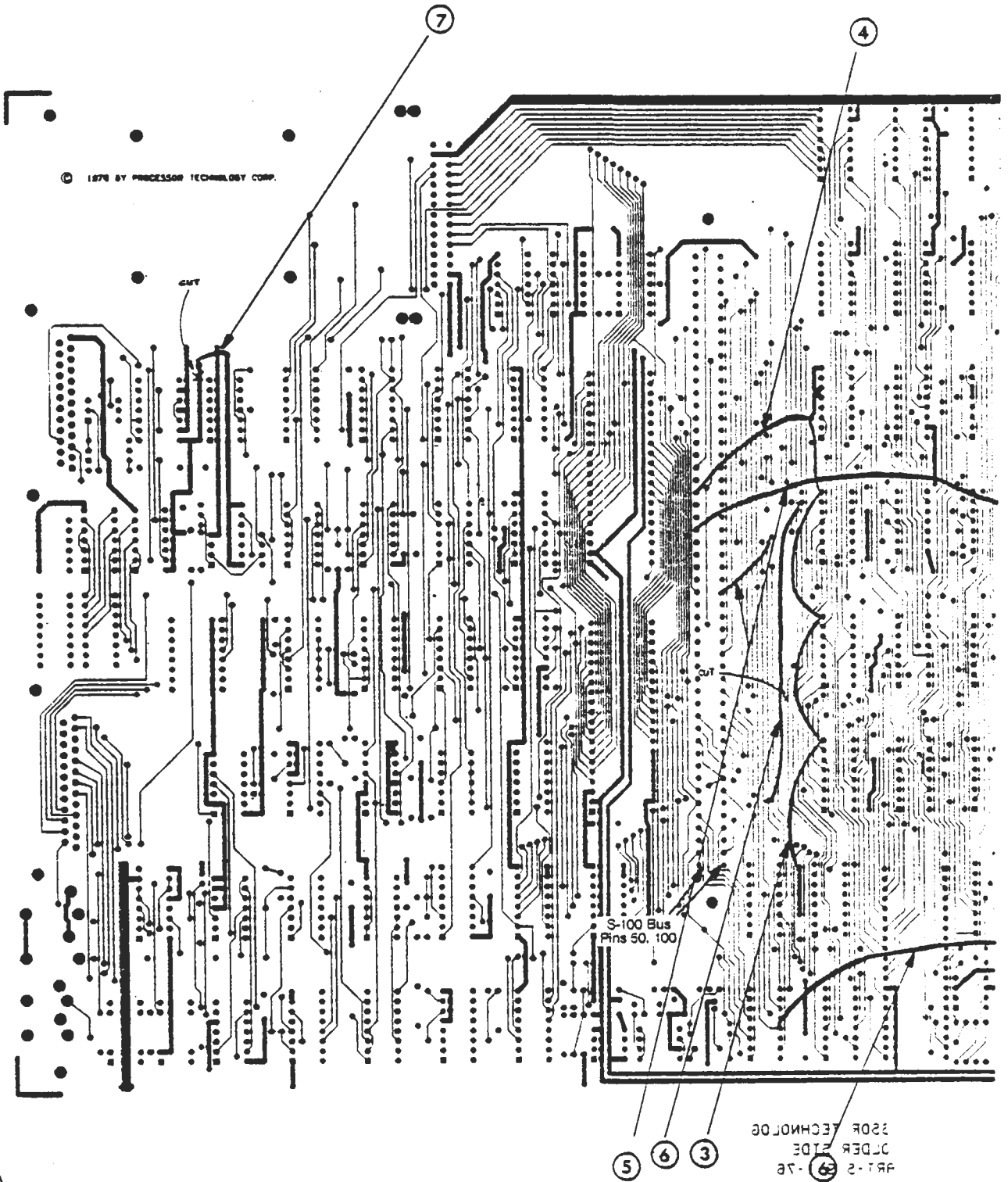
1

5

Sol-PC (Rev. D) — Component Side

Figure A

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Sol-PC (Rev. D)—Solder Side  
Figure B

Sol

REV E to F

The following is a list of changes to bring a Revision E Sol to a Revision F Sol:

1. Substitute a 270 ohm, 1/4 watt (5%) resistor for R21 (formerly a 470 ohm resistor).

This change is to increase the drive capability of the serial current loop and was elaborated in CHANGE NOTICE #10.

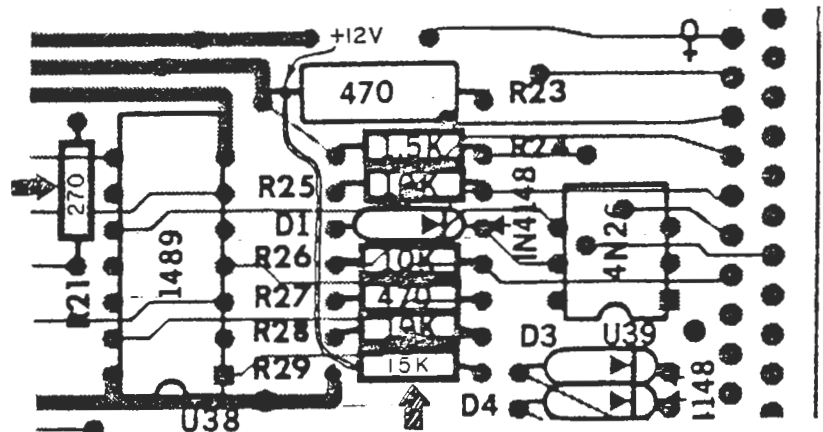
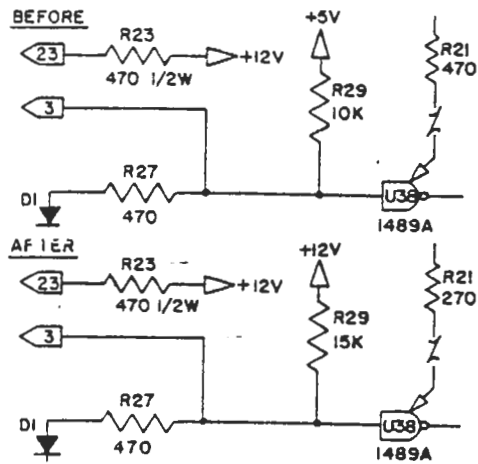
2. Change the value of VR3 from 50K pot to a 100K pot. This allows a wider range of variation when adjusting the VCO center frequency to account for part variation among vendors. Also, change the value of R154 from 100K to 47K.

To reset this frequency, turn Sol on and measure pin 4 of U110. It should read 14.0 KHz or 71.4 usec. This change is advised in CHANGE NOTICE #11.

3. If your Sol has a revision B Regulator PCB, it may be necessary to perform a mod to the crowbar circuit to enhance its reliability. These changes may be found in CHANGE NOTICE #6-2, REV C.

The following are the changes from a Revision F Sol to a Revision G Sol:

1. Substitute a 15K, 1/4 watt (5%) resistor for R29 (formerly a 10K resistor). Substitute a 270 ohm resistor in place of R21 (formerly a 470 ohm resistor). Install 1" length of tubing on R29 and bend lead near resistor body to form a 90-degree angle. With the PCB legend in the normal reading position, connect the angled end of R29 to the left hand lead of R23 (470 ohm). This connects the resistor to +12 Volts. See diagram below for details. This change was covered in CHANGE NOTICE #10 and is to increase the drive going into U38 of the serial current loop input.



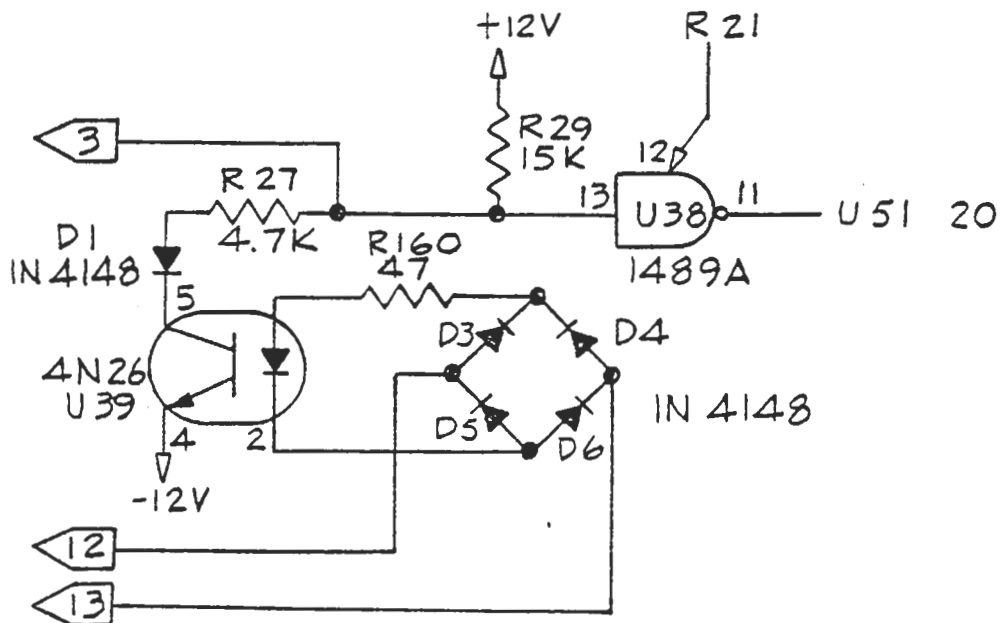
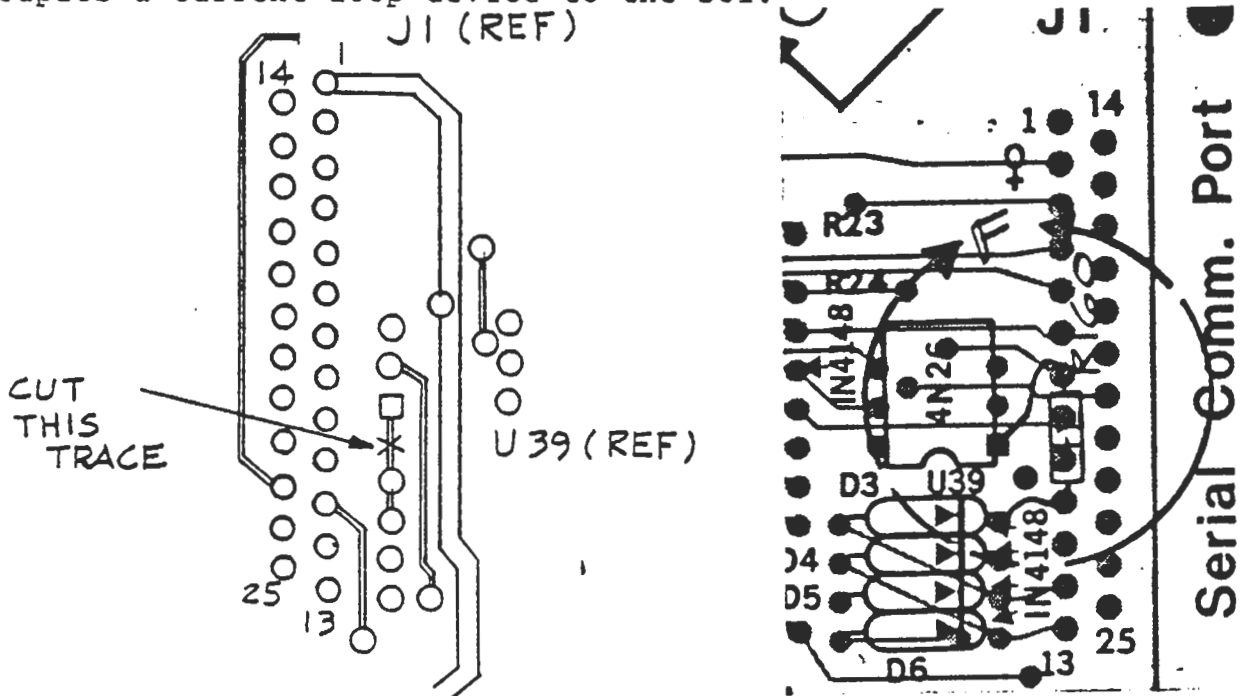
Sol

REV G to REV H

The following changes bring Revision G Sols to Revision H level:

1. Change the value of R27 from 470 ohms to 4.7K ohms.
2. On the solder side of the PCB, cut the trace connecting U39 pin 1 to the cathode of D3. Check with an ohmmeter to be sure the cut is complete.
3. Wrap one lead of R160 (47 ohm resistor) around pin 1 of U39 (4N26) and wrap the other end around the cathode end of D3 (band side of 1N4148). Solder both leads of R160 and check for possible shorts.

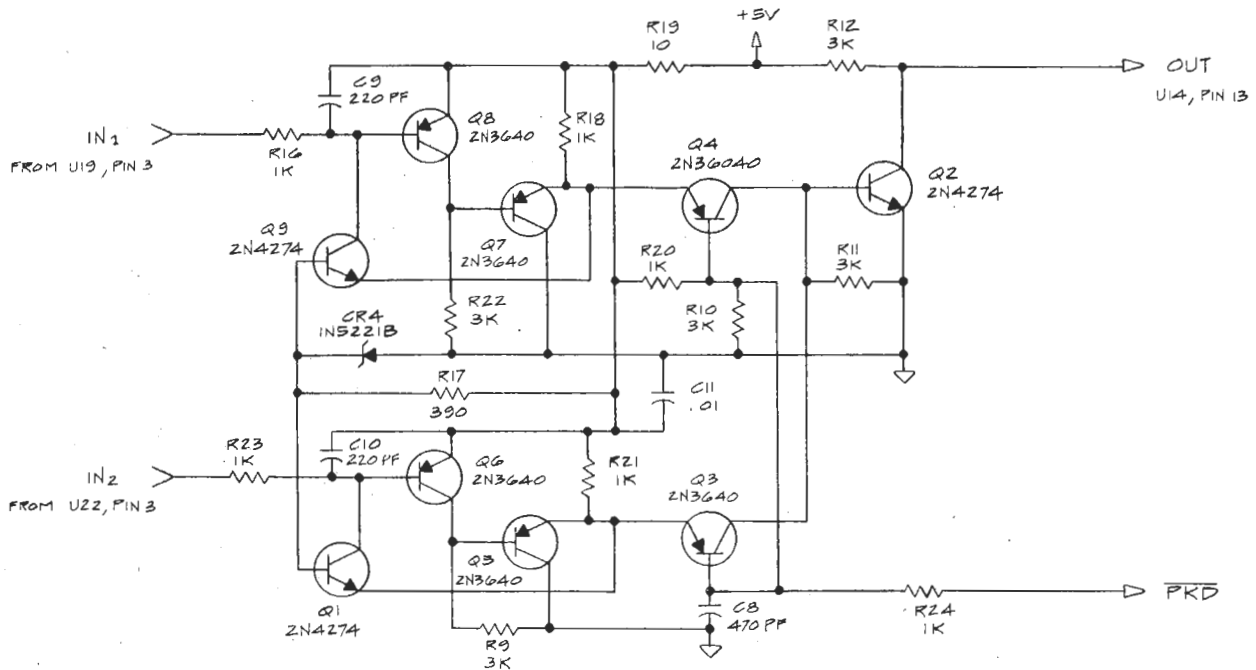
This change was to enhance the reliability of the opto-isolator which couples a current loop device to the Sol.



Sol MANUAL ADDENDUM #1

Reference Section X, Drawing X-23.

A block function labelled "K.T.C." is shown between U-19 and U22, and U14. This block contains the Capacitive Switch Detector Circuit. The parts constituting this circuit are listed, and the assembly covered in Section V of this manual. The theory of operation is covered in Section VIII. At the time of publication of this manual, operation of this circuit was proprietary information, but has now been released. The schematic is shown below. Note on the schematic X-23 that this detail is shown here on this page.





Cassette Recorders for use with Sol

Not all audio cassette recorders are suited for data storage use with the Sol. The following models have been tested and approved by Processor Technology:

1. Panasonic RQ-413AS
2. Realistic CTR-21

Some users have reported unsuccessful results with the Panasonic RQ-309 and the J. C. Penny Catalog #851-0018. If you should wish to select a different model, the following features, included on the models above, are necessary:

1. An AUX input. Although the Sol can be jumpered for low level Microphone level input, the procedure is no longer recommended.
2. A digital counter. The counter is necessary in locating programs on the cassette.
3. A tone control. The existence of a tone control is one indication of high quality electronics.

Even though a recorder has the three features, there is no guarantee that it will work properly for the purpose. Recorders vary greatly in the quality of their electronics. If possible, test the recorder with a long file before purchasing it, in both record (SAVE) and playback (GET or XEQ) mode. If the recorder is not working properly, either you will get an error message, or you will find differences between what was recorded and what was played back.

Observe the following pointers for best results:

1. Keep the recorder at least a foot away from the Sol, or other equipment which can generate magnetic fields. The recorder can pick up hum which may generate errors.
2. Keep the tape heads cleaned and demagnetized in accordance with the manufacturer's instructions.
3. Use high quality brand-name tape. Cheap tape can wear down the tape heads and give erratic results.
4. Bulk erase tapes before using.
5. Keep the cassettes in their protective plastic covers, in a cool place, when not in use. Cassettes are vulnerable to dirt, high temperatures, liquids, and physical abuse.
6. Set the tone control at midrange, and set the volume control about 2/3 full volume. The Sol has an automatic gain control circuit which compensates for a wide range of levels, but operation in the middle of this range will

give the most reliable results. Experiment to find the best setting of volume and tone controls.

7. On some cassette recorders, the microphone can be live while recording through the AUX input. Deactivate the mike in accordance with the manufacturer's instructions. In some cases this can be done by inserting a dummy plug into the microphone jack.
8. During recording, some recorders present the signal being recorded at the monitor or earphone output. In a system with two cassette recorders this could cause problems if an attempt was made to read from one recorder while the other was writing. Since both recorders share the same audio lines, the monitor output of the recorder which was recording could interfere with the signal being read from the other recorder.
9. If you record more than one file on a tape side, SAVE a special file, which could be named END, to let you know when you have played past the files of interest. After recording the last file on a side, rewind the tape, set the digital counter to zero, and issue a CATalog command (see SOLOS/CUTER User's Manual). As each file header is displayed, make a note of the reading on the digital counter, the exact name of the file, load address, and file length. Mark the cassette with this information to make file retrieval much easier.

If you experience a read error, use the following procedure to isolate the problem:

1. Check for proper settings, and make sure you have followed the pointers above.
2. Check cables for intermittent connections and shorts.
3. Note the exact reading of the digital counter at the time of the error.
4. Rewind the tape and try to read the same part of the tape again. If the tape reads without errors this time, the error was not recorded on the tape. If there is a read error at the same point, then the error is recorded on the tape.
5. Rewind the tape and record a file on the same part of the tape. Read the file. If the tape reads without errors, then the original read error was generated during the recording process. If there is still a read error at the same point, then the cassette itself is faulty.

Sol MANUAL ERRATA NOTICE #3

1. Reference Section X, Drawings, Drawing X-17, Input/Output.

In the Baud Rate Generator section of this schematic, the function of switch S3-7 is incorrectly shown as selecting 2400/4800 Baud, and S3-8 is incorrectly shown as selecting only 9600 Baud. Change the schematic to show that S3-7 selects 2400 Baud only, and that S3-8 selects 9600/4800 Baud. Draw a line connecting points L and M to indicate a jumper.

2. Reference Section VII, page VII-15, Table 7-2.

In the Baud Rate column of this table, change "4800\*\*\*" to read "9600\*\*\*". Also, in the footnote with the triple asterisk, change the phrase "SDI operates at 9600 Baud..." to read "SDI operates at 4800 Baud..."

## ASSEMBLY PROCEDURE CHANGE NOTICE #6-2 Rev B

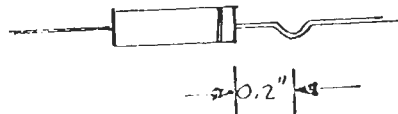
This Change Notice concerns the Sol-REG board and applies only to Revision Level B boards.

A problem was detected in early Sol-REG boards in which the "crow-bar" circuit would trigger without adequate cause and short circuit the 5-volt output. A circuit change has been made which will be reflected in Revision Level C and above boards to correct the problem. Revision Level B boards, however, require the following modification to correct the problem. Parts for this modification are supplied with your kit:

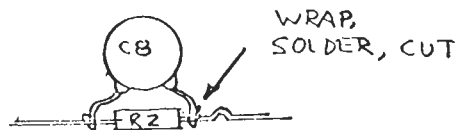
- 1) R2, 330 ohms, 1/4 watt, color code orange-orange-brown
- 2) R14, 100 ohms, 1/4 watt, color code brown-black-brown
- 3) D1, 1N5231B
- 4) C8, 0.047 uF disc ceramic

Assemble these parts as follows:

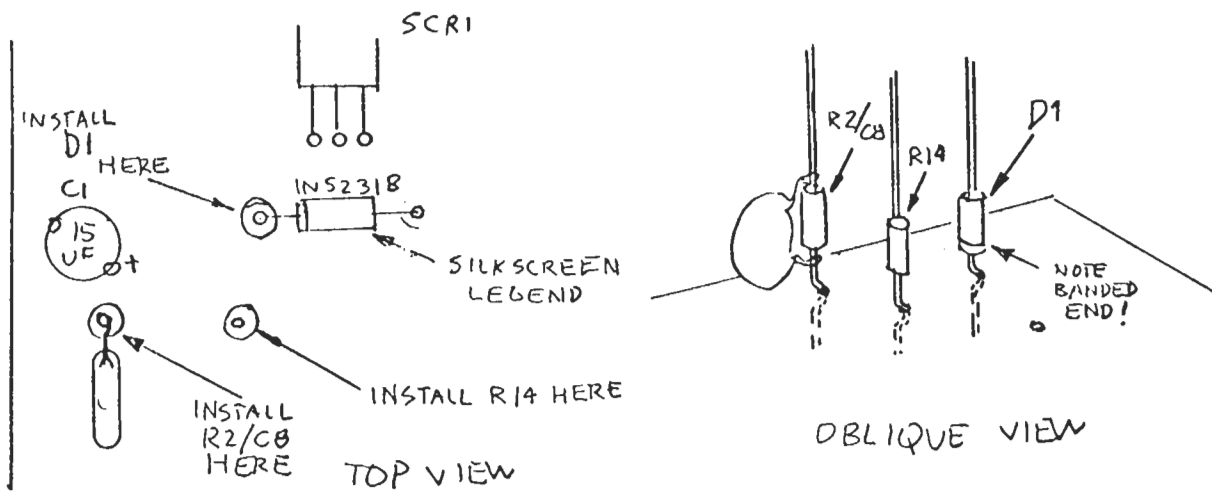
1. Form one lead of R2, R14, and the cathode (banded) lead of D1 for upright P.C. insertion as shown:



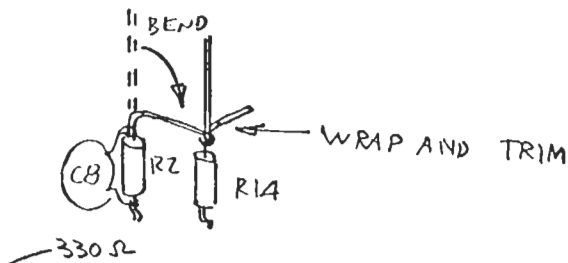
2. Solder C8 in parallel with R2 as shown:



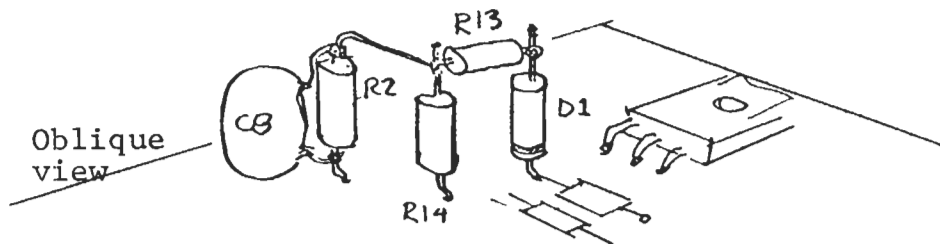
3. Install and solder R2-C8, R14, and D1 as shown below. Install the formed leads into the board with the unformed leads vertical. Position R2-C8 so that the body of C8 is parallel to the board edge and oriented away from C1.



4. Bend the top lead of R2-C8 over towards R14, and bend it around the top lead of R14 one-eighth inch from the body of R14. Solder, and trim the excess lead of R2-C8 only.



5. Install R13 between the top leads of D1 and R14. Wrap R13's leads around R14 and D1 leads. Solder all connections at both points, and trim excess lead lengths. The resulting final configuration is shown below.



Schematic Diagram X-12 of the regulator includes these changes.

## Sol MANUAL

### ASSEMBLY PROCEDURE CHANGE NOTICE #6-2 REV C

Subjects: Crowbar Fix for Sol Rev B Regulator P.C. Board  
Flat Washers in Final Cabinet Assembly

To enhance the reliability of the crowbar circuit which protects circuitry from overvoltage on the +5 volt supply, add the following additional parts, supplied with your kit, to Sol-Reg. Use the procedures given below after completing Step 13 of Section II, Sol Power Supply Assembly and Test. Make a note in your manual after Step 13 to remind you to do the additional steps below. Refer to the drawing on the next page as you add the parts to Sol-Reg.

Select the following additional parts from your kit:

- 1) R13, 330 ohms, 1/4 watt, color code orange-orange-brown
- 2) R14, 100 ohms, 1/4 watt, color code brown-black-brown
- 3) D5, 1N270
- 4) C8, .047 disc ceramic

( ) Step 1. Pass the two leads of C8 under the two leads of R2 (330 ohms) and bend around the leads of C8, close to the body of the resistor. Solder and trim the leads.

( ) Step 2. Wrap the leads of R14 around the right-hand leads of SCR1 and R2 (330 ohms), dressing the leads as shown in the drawing. Make sure the leads of R14 do not short to other leads of SCR1 or D1. Solder the lead to SCR1, but not the lead to R2 (330 ohms).

( ) Step 3. Wrap one lead of R13 (330 ohms) around the same right-hand lead of R2 (330 ohms), with the position of R13 parallel to D1 (1N5231B) as shown below. Solder the two leads which are wrapped around R2.

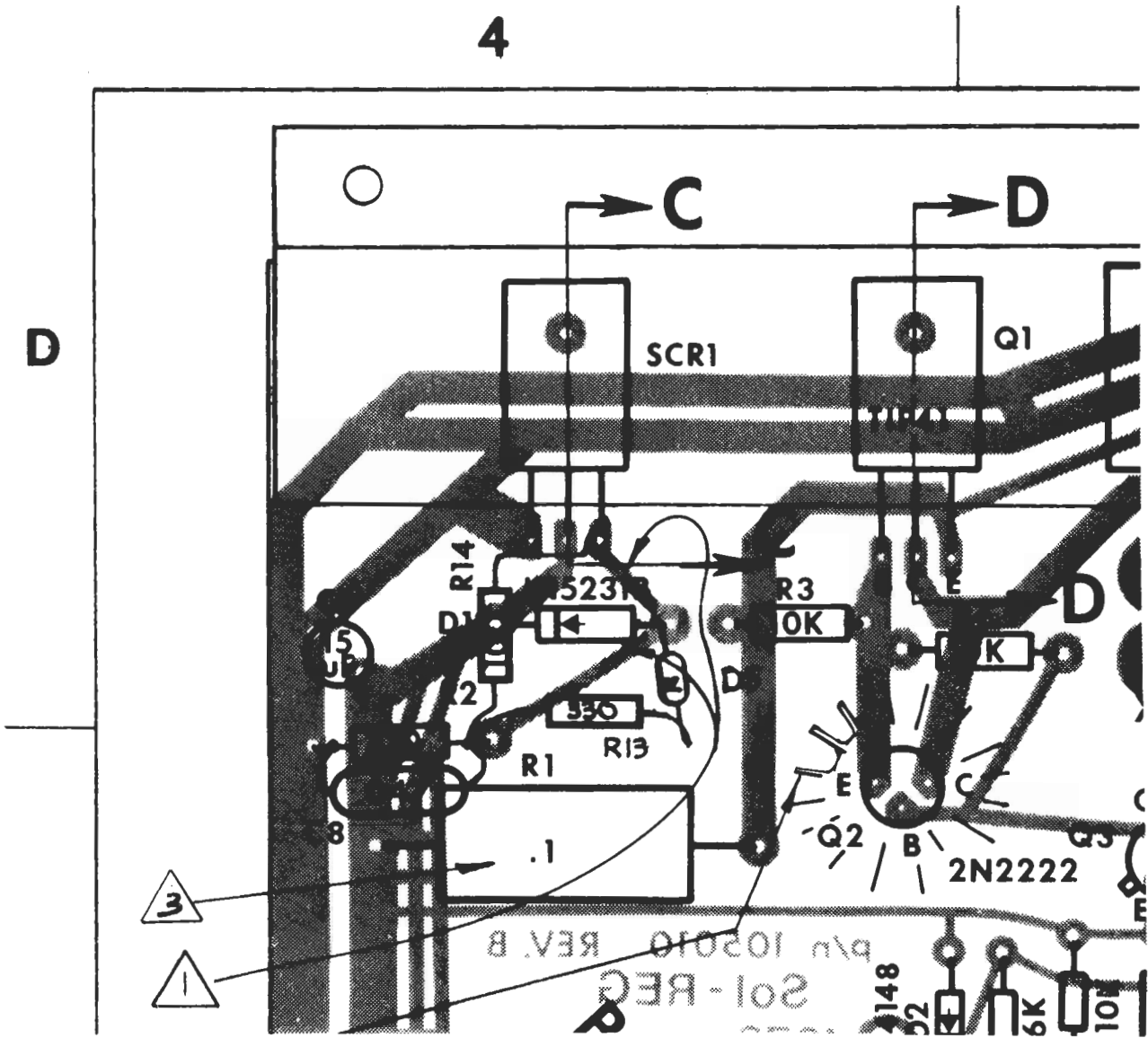
( ) Step 4. Wrap the leads of D5 (1N270) around the anode end (opposite banded end) of D1, and the loose end of R13 (330 ohms). Make sure the cathode (banded end) lead of D5 is connected to R13, not D1. Solder both ends of D5.

( ) Step 5. Trim all excess lead lengths, check lead dress, inspect for possible shorts or solder bridges.

The parts you have added are shown on the schematic Drawing X-16, with the exception of D5, which may be added by hand.

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Add the underlined words to the second paragraph of Step 30, Section 6.6.3: "...pan head screws, #4 lockwashers, and #6 flat washers. Place lockwasher then flat washer on screw..." Add the following item to Hardware in Table 6-1: "8 (each) #6 flat washers." Add the following sentence at the end of Section 2.2.1: "Refer to the assembly drawing on page 2 of Assembly Procedure Change Notice #6-2 REV C, as you assemble the regulator."

4



Cut these traces on the solder side of the PCB and add R13, R14 and C8 as shown.



Mount R1 approximately .15 from board surface.

<u>Item</u>	<u>Page No.</u>	<u>Figure or Step No.</u>	<u>Changes</u>
13	III-25	Step 28	Add note before Step 29, "Do Step 73 (p III-39) now."
14	III-27	Step 35	Add note to install: ( ) U93 74LS175, and ( ) U106 74LS175
15	III-30	Step 41	Delete installation of: ( ) U93 74LS175, and ( ) U106 74LS175
16	III-39	Step 71	Add note: "Mike input not recommended".
17	III-28	Step 38	In the third sub-step, add: "as in Figure 3-9".

In item 10 above, you made a note referring you to this Change Notice. Instead of the adjustment procedure given in Step 70 on page III-38, use the following procedure:

- ( ) Ground the "Audio In" jack J7 on Sol-PC.
- ( ) Apply power to Sol-PC.
- ( ) Using a high-impedance probe from an oscilloscope with a calibrated time base (a frequency counter is preferred, if available), monitor the VCO frequency appearing at pin 4 of U110 (type 4046).
- ( ) Adjust VR3 for a measured frequency of 14.0 kHz. This is a period of 71.4 usec.

Due to variations in the availability of ICs from various suppliers, a number of substitutions may be made of equivalent IC types. Please make the following changes in the manual on the pages given to reflect these possible substitutions:

<u>Item</u>	<u>Page Nos.</u>	<u>ICs</u>	<u>Main Type</u>	<u>Additional Substitutes</u>
1	III-2, III-35	U95,6	74173	8T10
2	III-2, III-13	U104	AM0026	MH0026, 0026, "xx"0026
3	III-2, III-28 III-38	U51, U69	TMS6011NC	S1883, AV-5-1013, TR1602B
4	V-2, V-7	U1, U2	74LS175	25LS175
5	V-2, V-7	U18	8574	many possible equivalents



## CHANGE NOTICE #9

Refer to the Sol Systems Manual, Section X, drawing X-14. The main power transformer, Sol-T2, supplies power for the +8 V dc unregulated supply, which is used by S100 cards plugged into the backplane. Distributed regulators on each S100 card reduce this voltage to +5 volts regulated. Some Sol-T2 transformers supplied with the Sol 20 kits were designed for brown-out conditions; even though the A. C. power line voltage should drop below normal tolerances, these transformers can maintain the unregulated supply so that the +5 volt regulators do not drop out of regulation. Unfortunately, these transformers can provide over +11 volts at a normal line voltage of 120 volts. If the unregulated supply is lightly loaded by boards in the backplane, and the boards in the backplane place heavy demands on their +5 volt regulators, the result can be excessive dissipation in the regulators, activating their normal thermal shut-down circuitry. The power supply circuit can be modified with the addition of a bucking transformer which reduces the effective primary voltage at Sol-T2 by 10 or 20% thus reducing the unregulated supply by 10 or 20% to eliminate the problem. This modification is recommended for all Sols which have the brown-out transformers, if they are used at a line voltage of 110-120 v.a.c. A schematic of the new circuit is shown below.

The transformers can be identified by looking for markings on the laminations of the transformer, on either the top or sides. If the marking "Sol T2" in large letters is found as in the photos below, no modification is necessary. If the marking "4 3991" in small letters is found, make the modification. If any other or no marking is found, contact Processor Technology for further information. If a voltmeter is used to confirm an



overvoltage condition, unplug all boards in the backplane, disconnect the five-pin molex connector which supplies power to the backplane board, and make the measurements at the connector between the blue wire, +8 V dc, and the end white wire, ground.

The following parts are included in the modification kit:

- (1) Triad F-57X 25.2 Volt CT Transformer, modified
- (1) Molex commoning block, (07-01-70)
- (1) 6-32 by .5" machine screw
- (1) 6-32 hex nut
- (1) #6 lockwasher
- (5) Tywraps

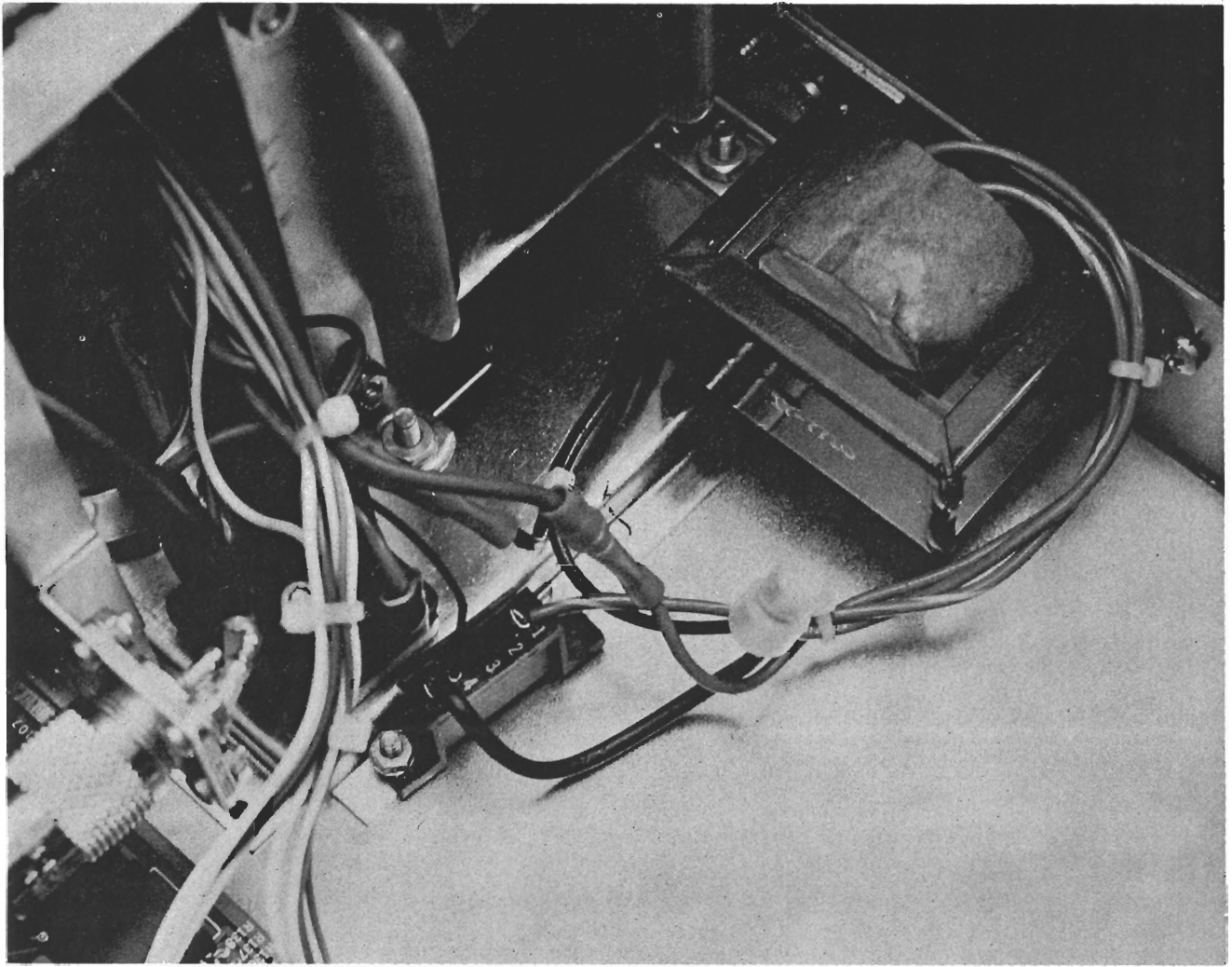
With the covers removed from the Sol, and facing the front (keyboard) side, perform the following modifications:

- 1) Remove the A.C. line cord, and video cable from the rear panel.
- 2) Remove the four screws and lockwashers which hold the keyboard circuit board in place.
- 3) Remove the keyboard from the Sol and detach the interconnecting cable from J3 on the main circuit board.
- 4) Remove the two 8-32 by .5" screws on the right-hand chassis lip between the Sol-T2 transformer and the keyboard bracket. These screws go into inserts in the wood side panel. See the photo below for assembly details.
- 5) Place the new bucking transformer into position over the two holes from which the two 8-32 screws were removed, with the two black primary leads down, and the three secondary leads up. Reinstall the two screws and tighten.
- 6) Locate the #6 sheet metal screw in front of the MDA 980-1 bridge rectifier, from the photograph. Remove the screw from the bottom of the Sol chassis, and insert the 6-32 by .5" from the modification parts in its place.
- 7) Place the new commoning block over the screw and secure with the #6 lockwasher and 6-32 nut.
- 8) Remove the fan closure plate (designated part 1 in drawing X-1) from the chassis, as follows: Remove one screw from the bottom center of the plate, which holds the plate to the rear of the chassis. Remove two additional screws which go through the expansion back chassis into the lip of the fan closure plate. Lift the plate out vertically by rocking back and forth - it may be a tight fit.
- 9) Examine the cabling within the power supply. Two new wires must pass through this cabling from the area of the new transformer to the two existing commoning blocks beside the fan. Cut tywraps as necessary to accomodate the new wires.
- 10) Remove the black lead which is inserted into the number 2 position of the commoning block which is nearest the fan.

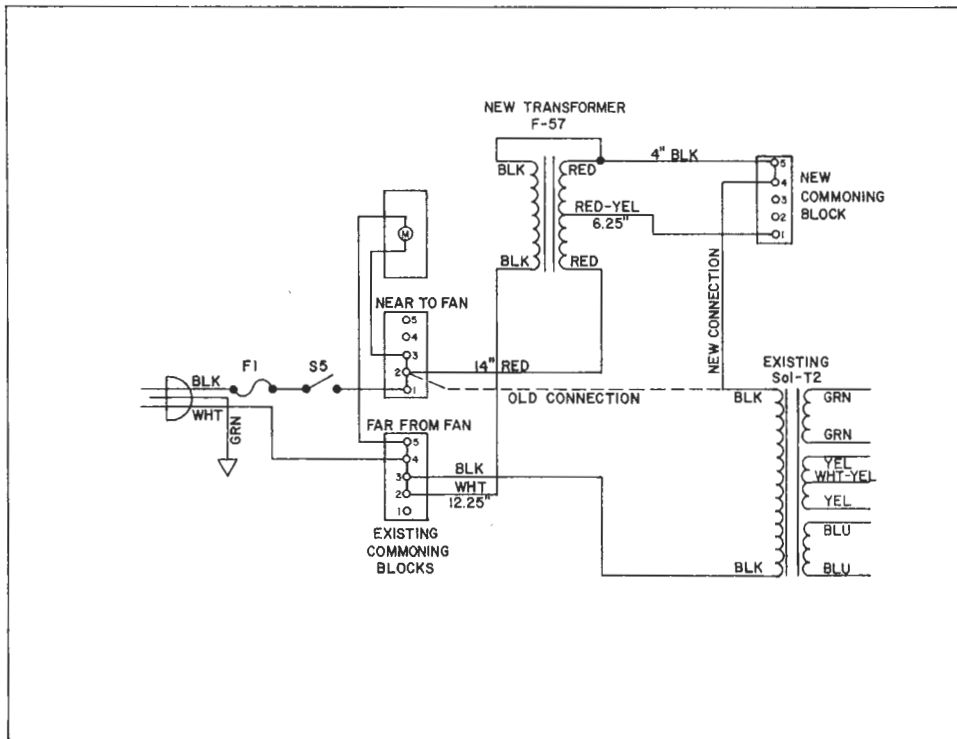
This lead is from the Sol-T2 transformer. Separate this lead from the twisted pair, back to its origin at the transformer.

- 11) Note that each of the leads to the new transformer has a different color: white, red, black, and yellow-red. Twist together the red and white wires into a twisted pair and route the pair beside Sol-T2, through the existing power supply cabling, to the two existing commoning blocks.
- 12) Insert the molex crimp pin from the red lead into position 2 of the commoning block nearest the fan, from which the other transformer lead was just disconnected. Push the crimp pin firmly into place until it clicks. Try to pull it out gently to confirm that it is properly seated.
- 13) Insert the crimp pin from the white lead into the position 2 of the commoning block farthest from the fan.
- 14) Insert the crimp pin of the black lead of the new transformer into position 5 of the new commoning block near the bridge rectifier.
- 15) Insert the crimp pin of the red-yellow lead of the new transformer into position 1 of the new commoning block.
- 16) Determine the line voltage at which the Sol will typically operate by a measurement or averaged series of measurements using an A.C. voltmeter.
- 17) If the typical line voltage is under 112 v.a.c., insert the crimp pin of the black lead of Sol-T2 which was previously detached into position 2 of the new commoning block, for a 10% voltage reduction at the primary of Sol-T2.
- 18) If the typical line voltage is over 112 v.a.c., insert the same crimp pin into position 4 on the new commoning block for a 20% voltage reduction.
- 19) Dress all leads, and install the tywraps provided to the cabling within the power supply.
- 20) Push the fan closure plate back into position and secure with the three screws which were removed.
- 21) Plug the cable from the keyboard into J3 on the main circuit board. J3 is to the right of a similar jack.
- 22) Place the keyboard back into position and secure with its four screws and lockwashers.
- 23) Apply power and measure the unregulated supply using the procedure described above, to confirm a 10 or 20% reduction.

Keep the pages of this notice in the Updates section of the Sol Systems Manual. Detach the schematic from page 4 and tape it into the blank area on drawing X-14.



CUT ALONG LINE

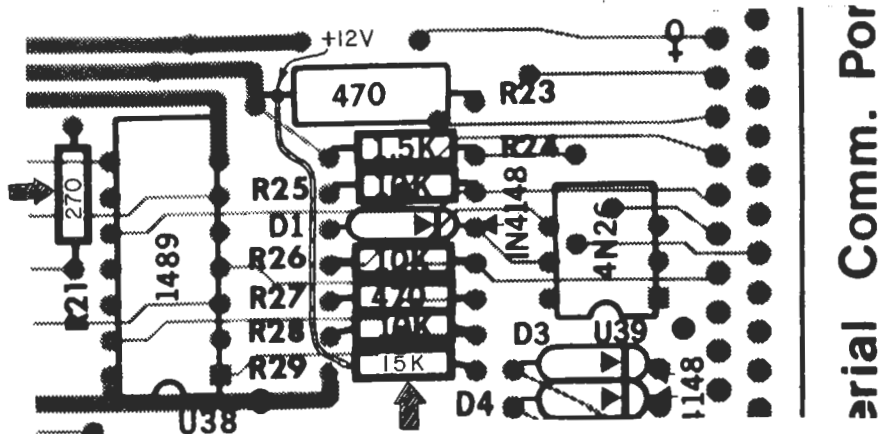
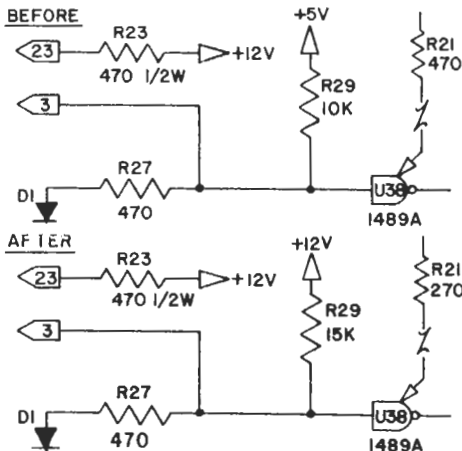


CHANGE NOTICE #10

Refer to Section X, Drawing X-17, Serial Data Interface/U.A.R.T. block. The section of U38 which has its input connected to pin 3 of J1 (Serial Loop Current Source) may not have enough drive at its input under worst case conditions, with the present values of R29, the input pull-up resistor, and R21, the resistor connected to pin 12 of U38. Substitute a 15K, 1/4 watt, 5% resistor for R29 (shown as 10K), and a 270 ohm, 1/4 watt, 5% resistor for R21 (shown as 470 ohm). These parts are included in the kit. Note in the schematics below that R29 is to be returned to +12 instead of +5. When R29 is installed, put the .9" length of tubing over the right hand lead. Clip this lead .1" longer than the tubing. With the legend on the P.C. board in normal reading position, hook this lead around the left-hand lead of R 24, a 1.5K resistor, and solder. Inspect the solder joint and lead dress for shorts. An assembly drawing detail of this modification is shown below.

Make the following changes in the manual before assembling Sol-PC.

Step	Page No.	Figure No., if any	Changes
1	X-17	Schematic, Input/Output	Change R21 value to 270 ohm
2	X-17	"	Change R29 value to 15K
3	X-17	"	Change R29 return to +12 V
4	X-3	Sol-PC Rev E Assembly	Change R21 value to 270 ohm
5	X-3	"	Change R29 value to 15K
6	X-3	"	Change R29 return to +12 V
7	III-3	Sol-PC Parts List	Add 1 270 ohm 1/4 watt, 5%
8	III-3	"	Change Qty. 470 ohm 1/4 watt to 2
9	III-3	"	Change Qty. 10K ohm to 31
10	III-3	"	Change Qty. 15K ohm to 2
11	III-33	Step 50	Change R21: 270 ohms, red-violet-brown
12	III-33	"	Change R29: 15K ohms, brown-green-orange
13	III-33	"	Under Step 50 instructions add: "See Change Notice #10"



Serial Comm. Port

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## Sol MANUAL - CHANGE NOTICE

### CHANGE NOTICE #11

Refer to Section X, Drawing X-19, Sol Audio Tape I/O Schematic. U110, a 4046 phase-locked-loop IC, has its VCO center frequency adjusted by VR3, shown as a 50K potentiometer. The upper frequency limit of adjustment is determined by R154, shown as a 100K resistor. The lower frequency limit is determined by the total resistance of VR3 and R154. Due to extreme variations in the specifications of this part among various vendors, the range of adjustment provided by VR3 and R154 is occasionally insufficient. To correct this problem, the value of VR3 has been changed to 100K, and the value of R154 has been changed to 47K. Parts of these new values have been included in your kit or assembled Sol. To insure that the parts are correctly installed if you have a kit, and in any case to insure that the manual reflects these changes, make the following notes in the manual:

<u>Item</u>	<u>Page No.</u>	<u>Figure or Step No.</u>	<u>Changes</u>
1	X-19	Schematic	Change VR3 value to 100K
2	"	"	Change R154 value to 47K
3	X-3	Sol PC Assembly	Change VR3 value to 100K
4	"	"	Change R154 value to 47K
5	III-3	Table 3-1.	Change Qty 47K resistor to 2
6	"	"	Change Qty 50K pot. to 2
7	"	"	Add 1 100K pot.
8	"	"	Change Qty 100K resistor to 3
9	III-36	Step 60	Change R154 value to 47K, yellow-violet-orange; VR3-100K
10	III-38	Step 70	Add note: "See Change Notice #11."
11	III-7	Section 3.4	Under item 11, Oscilloscope, delete "(optional)", add "with calibrated time base".

Make the following additional changes in the manual, unrelated to the substitution of new values for VR3 and R154:

11	III-24	Step 28	After sub-step relating to Figure 3-8, add note: "Adjust VR1 and VR2 for centering of the display."
12	"	"	In last sub-step on this page, change U49 to U59.

Sol MANUAL

## CHANGE NOTICE #13

SUBJECT: Side Panel Assemblies. Supersedes Change Notice #12.

The two wooden side panels of the Sol are now supplied as completely assembled and finished subassemblies consisting of the walnut and masonite side pieces, the tinnerman plastic inserts, and 5/8" wood screws presently listed in the Parts List, Table 6-1. Section 6.6.2 contains the procedure which was used to assemble the panels. The procedure may be useful if it becomes necessary to refinish the walnut pieces; otherwise it is no longer necessary. Write the following note in the manual on page VI-8 next to the heading for Section 6.6.6: Skip to 6.6.3.

To achieve a better grip in the tinnerman plastic inserts in the side panels, the 10 screws which mate with the inserts have been changed from type 8-32 to type 10-24.

Document these changes in your manual now by making notes in the manual as indicated below. This will save you confusion later during assembly.

1) Change Table 6-1, page VI-2, as follows:

- a) Change "1 Left Side Piece, Walnut" to "1 Left Side Assy."
- b) Change "1 Right Side Piece, Walnut" to "1 Right Side Assy."
- c) Delete "1 Left Side Piece, Masonite".
- d) Delete "1 Right Side Piece, Masonite".
- e) Change quantity 8-32 x 1/2 Screw, Machine from 11 to 3.
- f) Change "2 8-32 x 1 Screw, Machine" to type "10-24".
- g) Delete "12 5/8 Screw, Wood".
- h) Delete "10 Tinnerman Plastic Inserts, Tapped".
- i) Add "8 10-24 x 3/8 Screw, Machine".

2) Change all references in Steps 18 and 30, pages VI-12 and VI-30 from type 8-32 to type 10-24.

3) Change items 9 and 10 in Drawing X-10 from 8-32 to 10-24.

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## CHANGE NOTICE #14

Step 27, on page II-14 calls for the connection of the white wire from the Sol-20 DC power cable to pad X4, a ground connection. This pad is too small; the wire should be run instead to the pad immediately to the right of pad T3, also a ground connection. This pad is shown on the legend as pad X-10. (NOTE: Some legends incorrectly show this pad as a second pad X-5. Make sure that the red-white lead goes to the pad labelled X-5 which is between C5 and FWB2.)

To avoid confusion when you reach this point in the assembly procedures, cross out "X4 (above R8)" in Step 27, and write in its place "X10 (to right of T3)". If pad X10 is incorrectly labelled X5, the note should read "X5 (to right of T3)". Also make a note reading "See Change Notice #14."



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Sol MANUAL - CHANGE NOTICE

## CHANGE NOTICE #15

SUBJECT: 2708 Personality Module, value change for R1 and R2.

If you have a Personality Module using 9216 ROMs, ignore this notice. The 100 ohm values for R1 and R2 shown in your manual may cause overheating under certain conditions. Use 130 ohm, 1/2 watt, 5% resistors instead, which may have been included in your kit.

To make sure your documentation reflects the improvement, note the change in pencil at the following places:

- 1) Section IV, Table 4-1.
- 2) Section IV, Step 2.
- 3) Section X, Drawing X-6, Assembly.
- 4) Section X, Drawing X-22, Schematic.

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## CHANGE NOTICE #16

SUBJECT: Vectored Interrupt Capability for Sol

The Sol Computer and other S100 modules built by Processor Technology do not require use of the vectored interrupt capability which the 8080A microprocessor used in the Sol provides. The Sol provides, however, means for implementing vectored interrupt when the interrupt signal is made available by a circuit board inserted in the S100 bus, on S100 bus pin 96, SINTA. If a circuit board in the backplane generates interrupts, two jumpers, shown below, should be added to Sol P.C., to enable the SINTA signal to reach the memory decoder circuit. These jumpers may be added after completing the assembly of Sol-P.C., or even after the Sol is completely assembled and tested. The jumpers should be made from #24 solid, insulated wire (not provided). The electrical effects of these jumpers may be seen on Drawing X-16. These jumpers may be left in place even if no S100 board generates interrupts. S100 bus pin 96 may float with no interference.

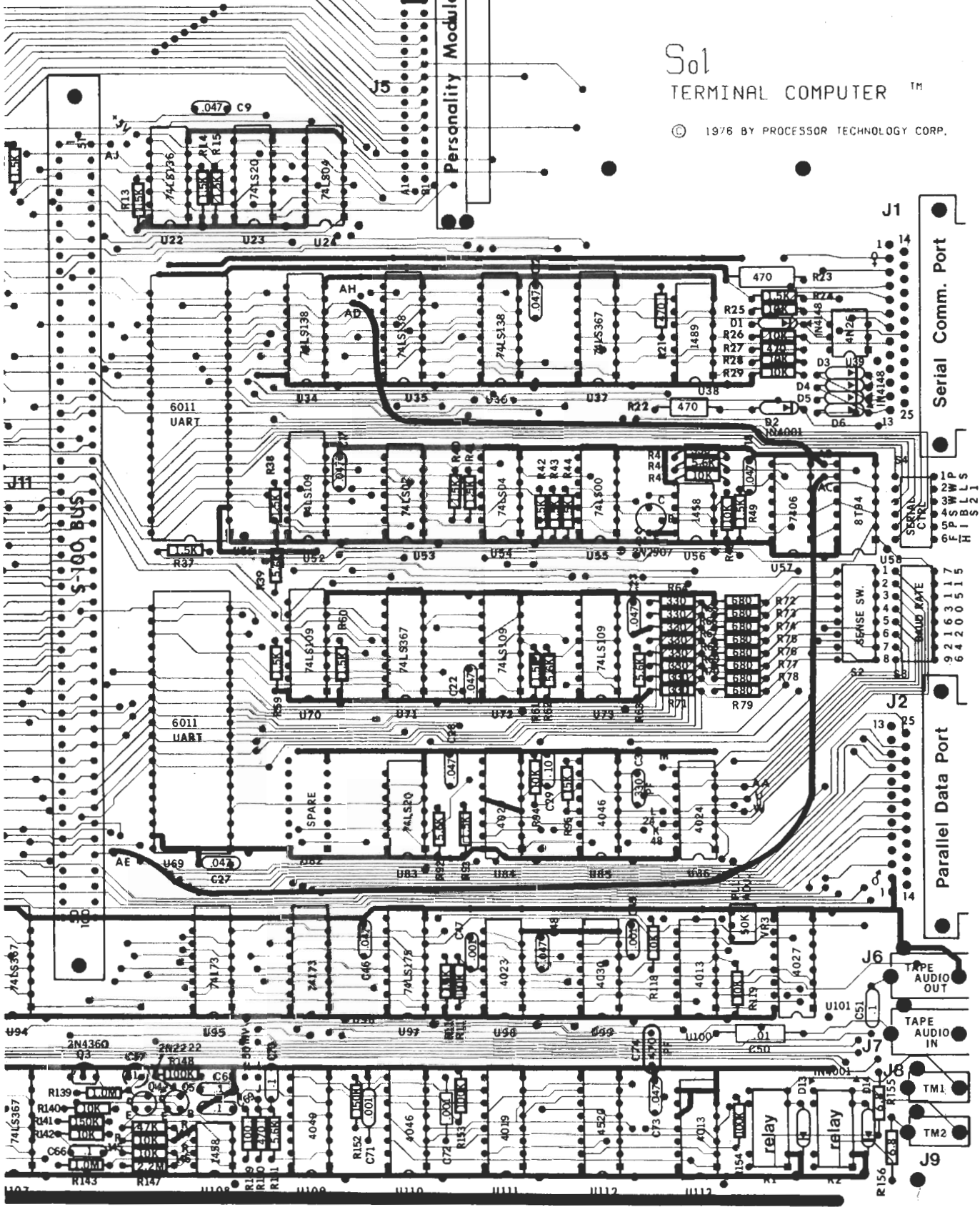
- ( ) Step 1. Strip .1" of insulation from one end of each of two eight-inch lengths of wire, and insert into pads AC and AB (near U58) from the component side of the board. Solder and check for solder bridges.
- ( ) Step 2. Dress the wires as shown in the drawing below, trim to length, strip .1" from the loose ends. Insert the wire from pad AB into pad AD, and the wire from pad AC to AE. Solder and inspect for solder bridges.
- ( ) Step 3. Fix the long runs of wire to the board using silicone compound or tape.

PC102001

# Sol TERMINAL COMPUTER™

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Personality Module



Sol UPDATE 731011

SUBJECT: Optical Isolator (U39) Circuit Change

To enhance reliability of the optical isolator (U39) which couples data from a current loop device to the Sol, make the following circuit changes. Use the procedure given below after you complete Step 49 in Section III, Sol-PC Assembly and Test. Make a note in your manual after Step 49 to remind you of this change in the assembly procedure. Refer to the drawings on the next page while performing the following steps.

- ( ) Step 1. In Table 3-1, Page III-3, increase quantity of 47 ohm resistor from 2 to 3, reduce quantity of 470 ohm, 1/4 watt resistor from 2 to 1, and add one 4.7K ohm, 1/4 watt, 5% resistor.
- ( ) Step 2. In Step 50 on Page III-33, change R27 value from 470 ohms to 4.7K ohms (color code yellow-violet-red).
- ( ) Step 3. Complete Steps 50 through 58 in Section III.
- ( ) Step 4. Install R160 (47 ohm resistor, color code yellow-violet-black) as follows:
  - ( ) Wrap one R160 lead around pin 1 of U39 (4N26) and the other around the cathode lead (banded end) of D3 (1N4148), dressing the leads as shown in Figure A.
  - ( ) Solder both R160 leads in place and trim excess lead lengths.
  - ( ) Inspect for possible shorts or solder bridges, especially between pins 1 and 2 of U39.
  - ( ) On the back (solder) side of the board, the trace that connects pin 1 of U39 to the cathode lead of D3 must be cut. Using an Xacto knife or a razor blade, make two cuts approximately 1/8" apart, cutting across the trace down to the epoxy base. Insert blade tip beneath the cut section and gently work it away from the board. Be sure the "break" is free of solder.

- ( ) Step 5. On Drawing X-17 in Section X, change value of R27 from 470 ohms to 4.7K ohms and add R160 (47 ohm resistor) between pin 1 of U39 and the cathodes of D3 and D4. (Refer to Figure B.)
- ( ) Step 6. Go on to Step 59 in Section III.

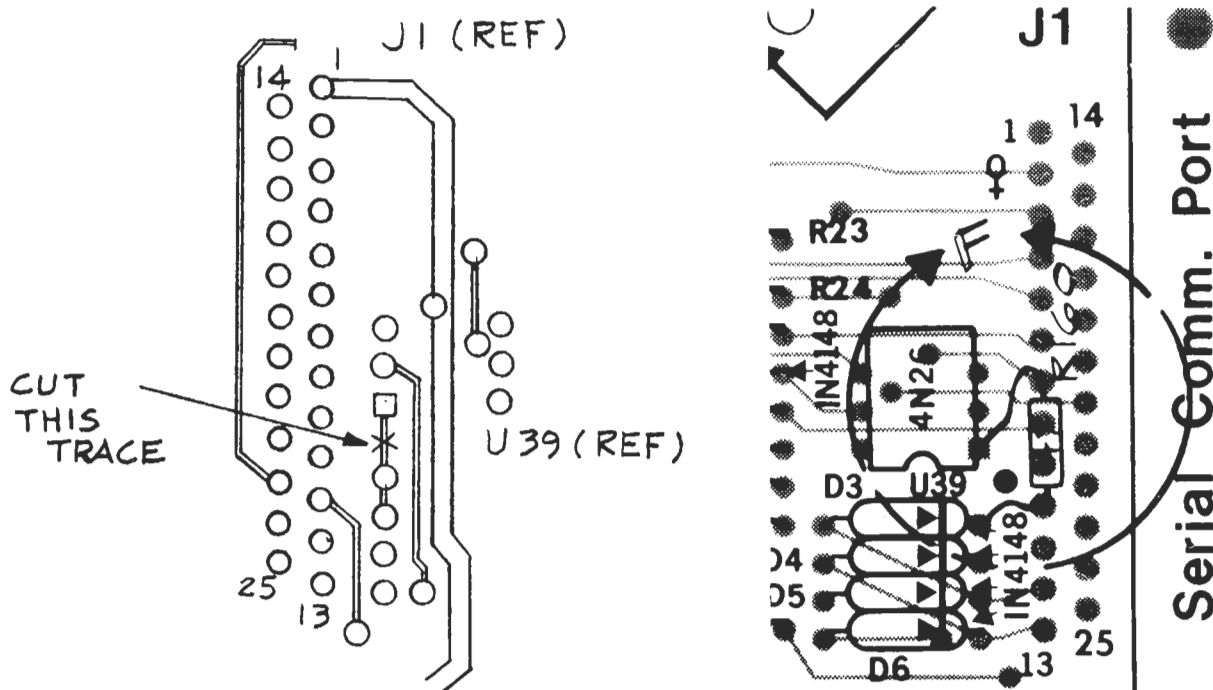


Figure A

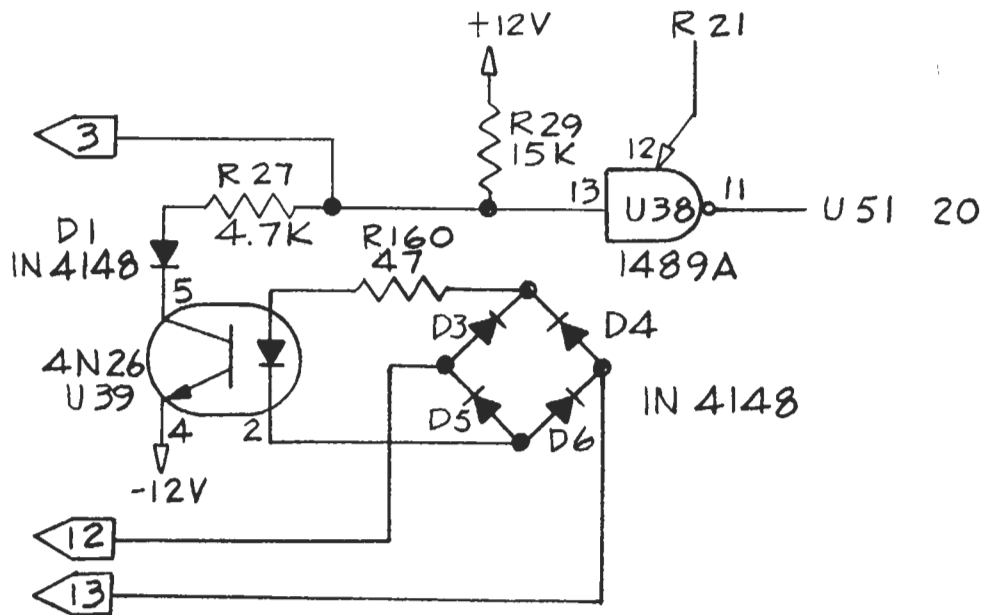


Figure B