

SERVICETEKNOTES

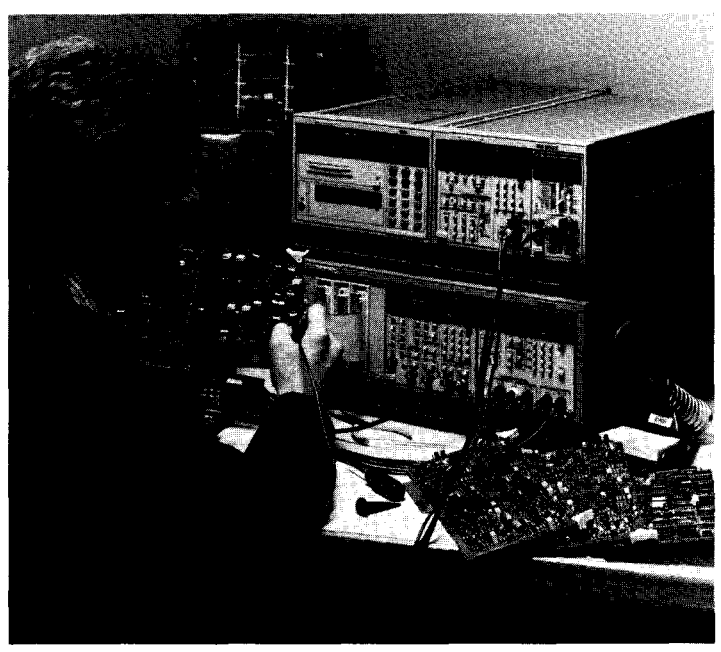
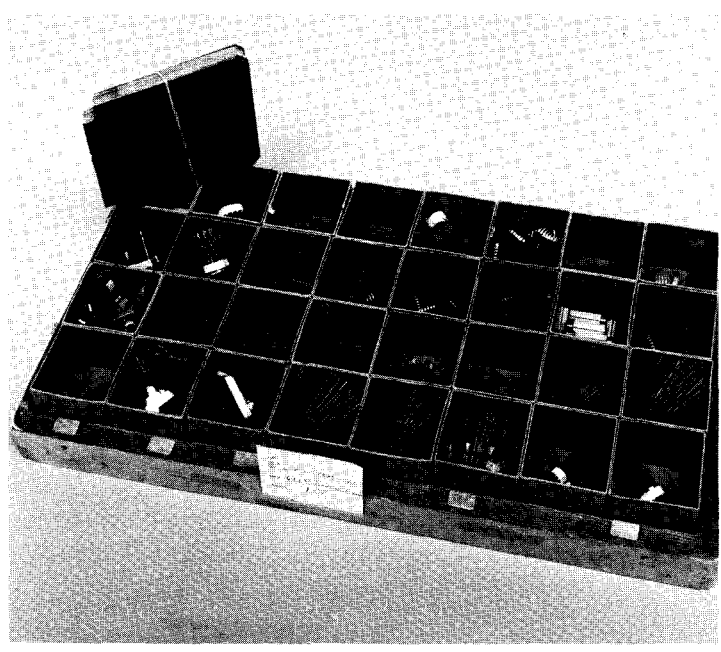
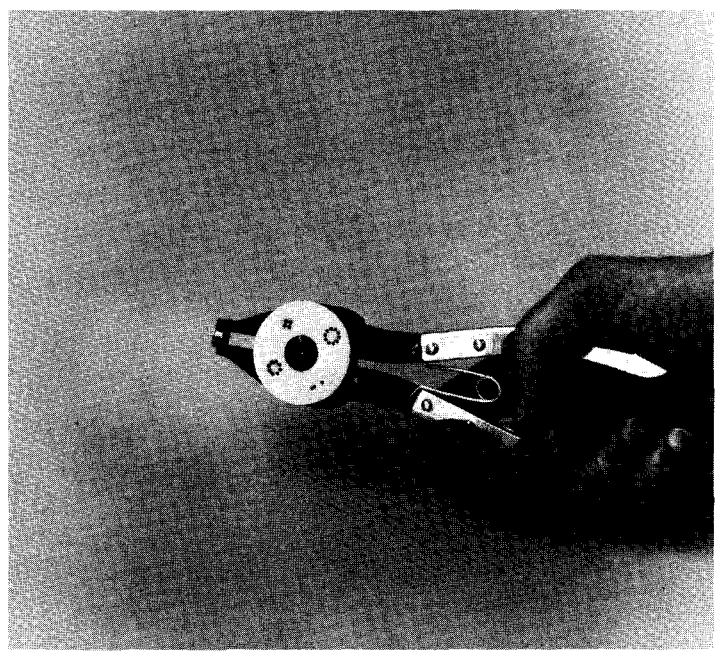
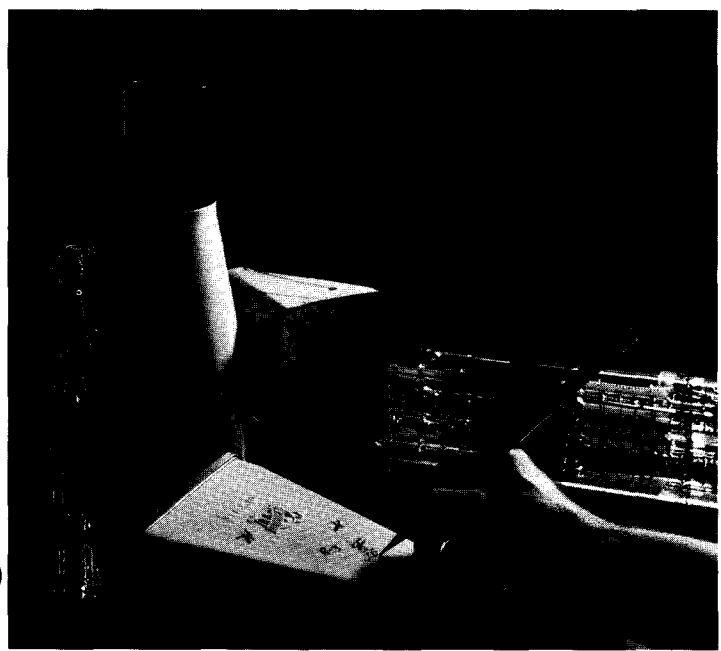


TABLE OF CONTENTS

AA501 LDR RELIABILITY IMPROVEMENT 1
COLOR CRT MEASUREMENTS. 1
DC5009/5010 ROM'S REMOVED FROM REPLACEMENT CIRCUIT BOARDS 1
PS501-1 POWER SWITCH RELIABILITY IMPROVED 1
SOLDER MASK TAPE NOW AVAILABLE. 3
7D15 CAL PROCEDURE CHANGE 3
7D20T ERROR 632 PREVENTION. 3
50M20 PROGRAM LISTING CORRECTION. 3
410X ADS01 PULLEY FAILURE 3
410X BOARD NUMBER CHANGES (SUFFIX) MOD #M53866 AND #M53056. 5
463X DRIVE ROLLER END PLAY. 6
614/618/4054X/4114X/GMA101/GMA102 TIN PINS OVERHEAT 6
634 OPTION 15 CHANGE NUMBER 57333 7
1470 CABLE HARNESS CHANGE, S/N B02000 AND UP. 7
1910 CPU RS232. 7
1980 SERVICE KIT UPDATE 8
1980/4105 COMPATIBILITY 9
4014/4114/4054/GMA 19" SERIES, INTERMITTENT DVST WIRE HARNESS 9
4170 HARD DISK FORMAT FAILURE 10
4170/4926 HARD DISK NYLON WASHER REMOVAL. 10
4695 HARDCOPIES FROM THE 4107/4109. 10
4907 FIRMWARE VERSION 1.4 11
4907 119-0977-05 STRAP CONFIGURATIONS 12
4909 CONTROLLER POWER SUPPLY. 20

AA501 LDR RELIABILITY IMPROVEMENT

Ref: Mod 54377

Under some conditions of input signal and temperature, Light Dependent Resistors (LDR) U1031 and U1032 may be overstressed, shortening their life expectancy. Failure of these parts will disable the automatic frequency tuning circuits.

The recommended modification is to remove thermistor RT1030 and add CR1113 (PN 151-0141-02) in parallel with resistor R1113. The cathode of CR1113 should be toward the base of Q1110. These changes are on schematic 4 of the AA501 manual.

W2 Issue 14-8

COLOR CRT MEASUREMENTS

The April '84 issue of Test and Measurement World contains two very good articles concerning Color CRT measurements, one of which is authored by Pete Keller, Tektronix Technology Group.

The articles will acquaint the reader with the CIE chromaticity curves, techniques used to make the measurements involved, and some of the various trade-offs.

These articles are recommended reading for anyone dealing with Color displays and/or wishing to improve their understanding of this important technology.

W2 Issue 14-8

DC5009/5010 ROM'S REMOVED FROM REPLACEMENT CIRCUIT BOARDS

To eliminate double inventory and increase availability of parts, the ROMs were removed from a replacement

circuit board for the DC5009 and DC5010. The A14 GPIB board in both units is identical except for the ROMs, and will now be stocked under a common part number. The ROM's must be ordered separately.

The new part numbers are as follows:

A14 GPIB	DC5009/5010		670-6797-04
ROM	DC5009	A14U1102	160-1091-02
		A14U1201	160-1092-02
	DC5010	A14U1102	160-1091-01
		A14U1201	160-1092-01

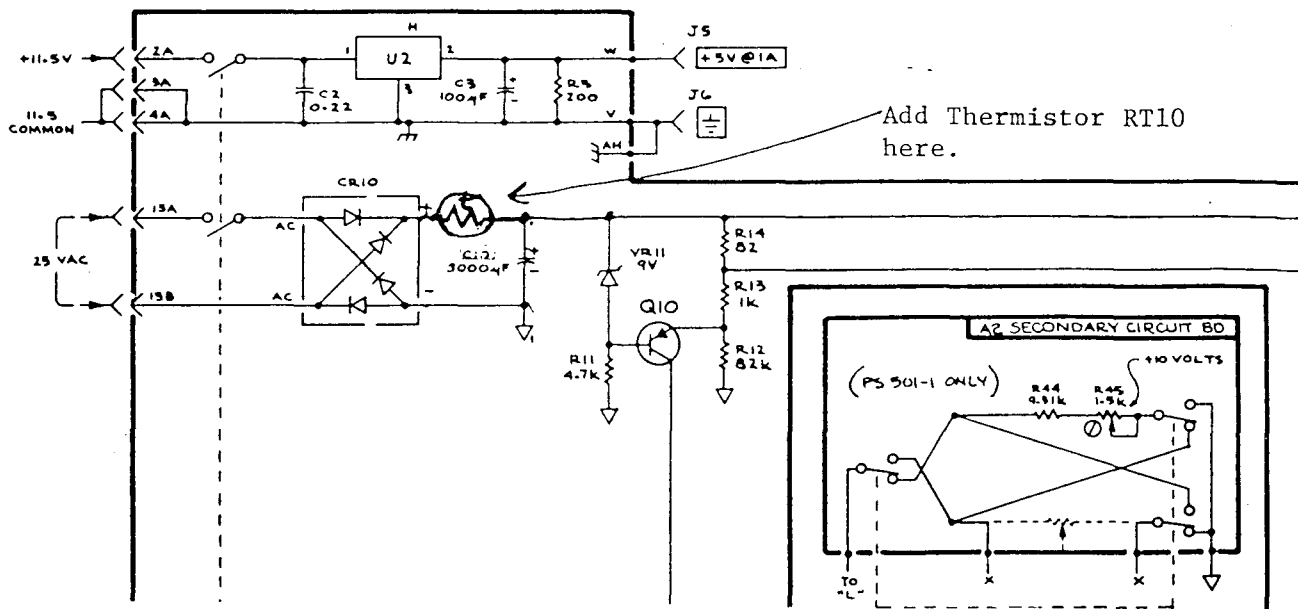
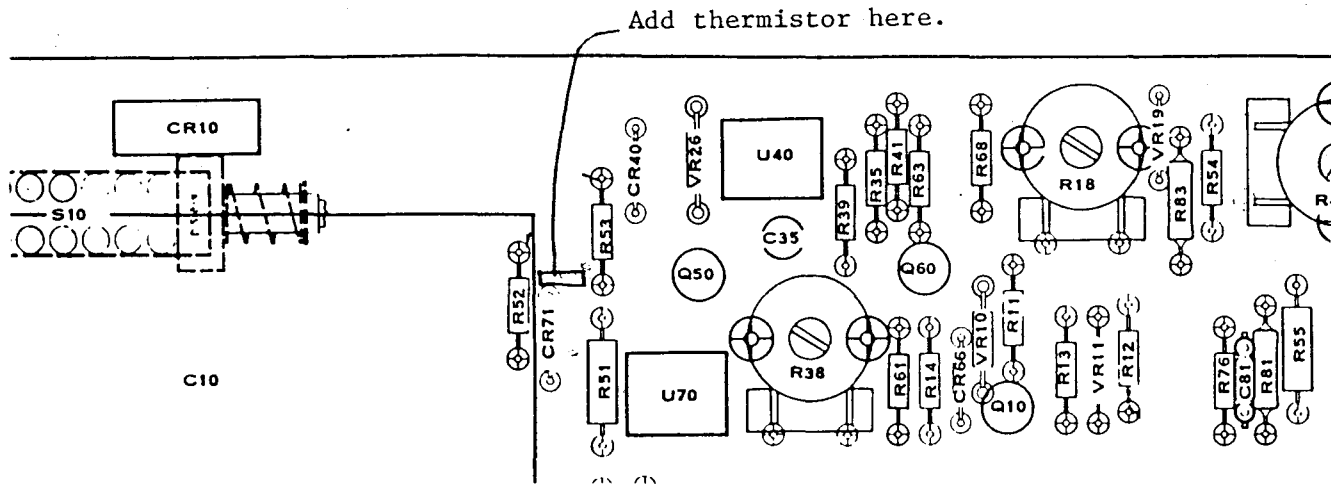
W2 Issue 14-9

PS501-1 POWER SWITCH RELIABILITY IMPROVED

The reliability of the power switch S10 has been improved by reducing the surge current to C10 at turn-on. This has been done by adding a thermistor in series between the anode of CR10 and the positive lead of C10. The thermistor PN is 307-0746-00. This part is most easily installed by removing the upper bare wire attached to the plus terminal of C10 and replacing it with the thermistor. See attached drawings. This mod should be installed in every PS501-1 that is serviced.

(ARTICLE CONTINUED ON THE NEXT PAGE)

PS501-1 POWER SWITCH RELIABILITY IMPROVED (CONT.)



W2 Issue 14-9

SOLDER MASK TAPE NOW AVAILABLE

It is sometimes necessary to solder next to a gold plated contact surface on many of our circuit boards. This creates the danger of solder flowing onto the gold surface and destroying the contact area.

We now have available a tape designed to solve this problem. It can be applied over the gold surfaces, and will leave minimal residue when removed. This tape is resistant to melting at normal soldering temperatures.

The tape is available in three widths, as listed below.

1/2"	253-0145-00
3/4"	253-0144-00
1"	253-0143-00

W2 Issue 14-9

7D15 CAL PROCEDURE CHANGE

REF: 7D15 Manual, P/N 070-1433-00

On the following page is a procedure change to Step 13, Page 5-11.

W2 Issue 14-9

7D20T ERROR 632 PREVENTION

Ref: Mod 54341
SN B010135

The Z axis signal from the 7D20T and 7D20T Option 1 power module may not always provide the correct drive to the 7D20. This can cause an error 632 at power up. If this happens, change R2045 to a 910 ohm 1/4 watt resistor, PN 315-0911-00. This change will be

installed in all power modules manufactured with serial number B010135 and above.

W2 Issue 14-8

50M20 PROGRAM LISTING CORRECTION

It has been brought to our attention that the 50M20 Check and Adjust program listing on page 4-3 of the service manual is missing several lines of code. Lines 530 through 1020 were omitted in recent printings. The missing program steps are as follows:

```

530 GO TO 470
540 END
550 REM DECREMENT
560 PRINT @A:"DAT?"
570 INPUT @A:Q$
580 PRINT @A:"DAT ";VAL(Q$)-1
590 END
600 REM INCREMENT
610 PRINT @A:"DAT?"
620 INPUT @A:Q$
630 PRINT @A:"DAT ";1+VAL(Q$)
640 END
1000 REM SRQ ROUTINE
1010 POLL A,S;23
1020 RETURN

```

W2 Issue 14-10

410X ADS01 PULLEY FAILURE

Several ADS01s have had trouble with two of the nylon pulleys pulling off at the bearing (refer to Figure 1). The problem has been identified, and a solution is available.

The solution is to add a 210-0804-00 (dimensions of washer .172 ID, .375 OD, and .30 thickness) steel washer between the pulley and mounting stud (refer to Figure 1).

(ARTICLE CONTINUED ON PAGE 5)

DESCRIPTION PG 42

CHANGE TO:

Step 13, Page 5-11, TIM WIDTH A AND TIM A to B ACCURACY

Delete entire step g.

Change step i to read: Check for decreasing gate time (indicated by faster flashing of gate light) and constant readout display of 10 ns \pm 1 ns as the TG 501 is switched from 1 ms to 10 μ s.

Delete item number 7 from the required test equipment. (Pulse Generator)

Change Figure 5-7 to the following:

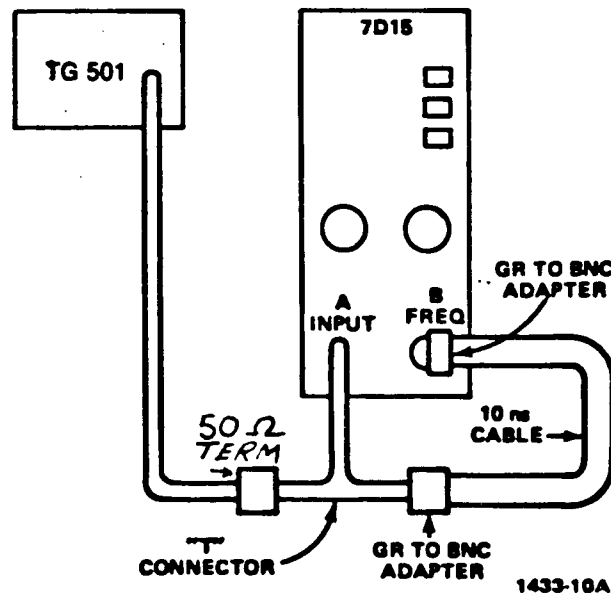


Fig. 5-7. Equipment setup used to check TIM A-B accuracy.

410X ADS01 PULLEY FAILURE (CONT.)

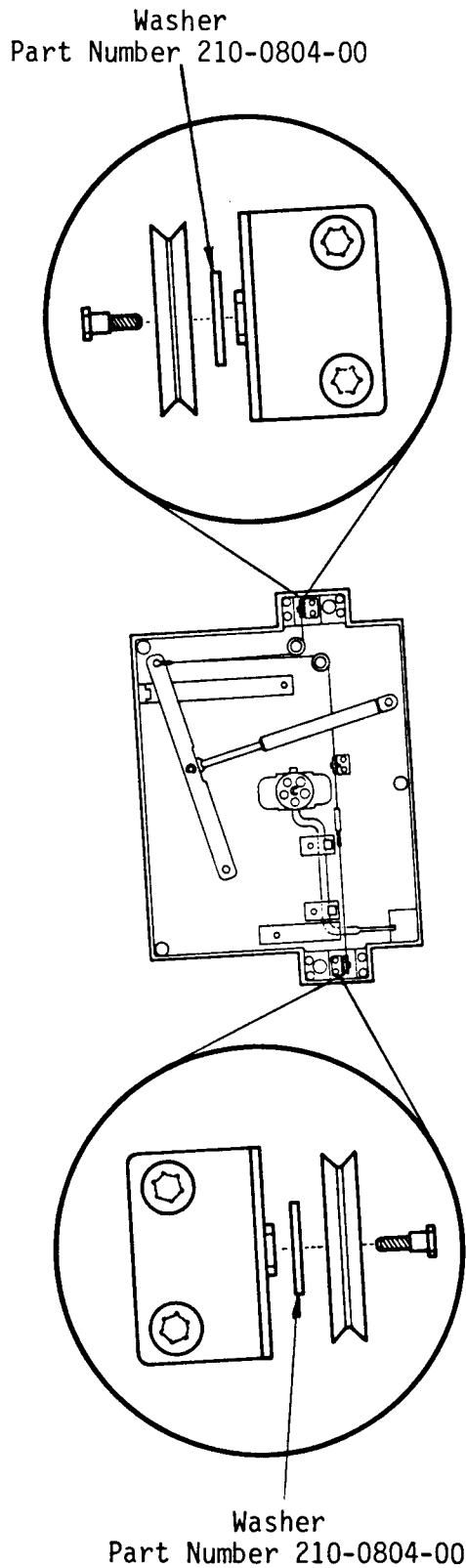


Figure 1

410X BOARD NUMBER CHANGES (SUFFIX)

MOD #M53866 AND #M53056

The suffix on the board numbers for the 410X products have changed. You will start seeing suffix numbers of -15 or greater. This does not indicate 15 modifications had occurred to the board. The increase of the suffix number was a method chosen to separate inventory manufactured from two separate circuit board manufacturing lines. The original manufacturing line will eventually be replaced by the second (newer) manufacturing line. The original manufacturing line is still using the conventional suffix number which started at -00. The newer manufacturing line is using -15 number as its starting point. Therefore, there are two part numbers for each board in the 410X products.

The following is a cross reference of board levels which are the same electrically.

4105 BOARDS

Display Control Board	
Original Number	670-7936-05
New Number	670-7936-15

Terminal Control Board	
Original Number	670-7935-03
New Number	670-7935-15

Power Supply	
Original Number	620-0005-00
New Number	620-0005-15

4107 BOARDS

Display Control Board	
Original Number	670-8233-03
New Number	670-8233-15

Terminal Control Board	
Original Number	670-8234-02
New Number	670-8234-15

(ARTICLE CONTINUED ON THE NEXT PAGE)

410X BOARD NUMBER CHANGES (SUFFIX) MOD
#M53866 AND #M53056 (CONT.)

Power Supply
Original Number 620-0005-00
New Number 620-0005-15

RAM III
Original Number 670-7196-00
New Number 670-7196-15

W2 Issue 14-9

463X DRIVE ROLLER END PLAY

Ref: 4631 Service Manual, 070-1831-02
4632 Service Manual, 070-1686-04
4634 Service Manual, 070-3636-00

A replacement 463X drive roller, P/N 401-0232-01, may exhibit excessive end play after installation. Excessive end play (approximately 1/16") will cause the interrupter wheel to bind on the optic coupler bracket. Currently, the 463X manufacturing line is adding washers, P/N 210-0940-00, on an as-required basis to eliminate end play with the drive roller.

It is suggested that some quantity of washers be obtained and held on hand, if needed, to shim any drive rollers that have too much end play.

W2 Issue 14-11

614/618/4054X/4114X/GMA101/
GMA102/GMA103 TIN PINS OVERHEAT

REF: Corporate Mod #52316

Service Support has had an occasional field report of tin pins mated with gold connectors overheating, especially on high current connections.

Symptoms are faded images in a corner or side of a DVST CRT and/or hard copy.

Also burnt connectors and burnt ECBs around tin to gold connections may occur.

The Low Voltage Power Supply and Interconnect boards in the 19" GMA based DVST products use tin pins. The interconnect cables that plug into the tin pins use gold plated connectors.

Engineering has found that when a tin to gold connection is made it can become resistive over a period of time. To eliminate this type of connection, Corporate Mod #52316 provides the replacement of the tin pins with gold plated pins as follows:

1. 5 pin tin 131-1974-00 replace with 1 each 5 pin gold 131-2250-00
2. 12 pin tin 131-1975-00 replace with 2 each 6 pin gold 131-2576-00
3. 15 pin tin 131-1976-00 replace with 3 each 5 pin gold 131-2250-00

The following boards rolled with the use of gold pins:

1. Low Voltage Power Supply boards
 - A. 670-4798-06 to -07 for GMA101, 614, 618, 4054X, and 4114X
 - B. 670-7008-00 to -04 for GMA102
 - C. 670-7008-01 to -05 for GMA103
2. Interconnect boards
 - A. 670-5163-01 to -02 for GMA102, GMA103, 614, and 4114X
 - B. 670-6099-00 to -02 for 618 and 4054X

Besides the gold pins, you may want to employ, if not already in the instrument, Trifurcon connectors. The Trifurcon connector is more reliable and causes less heating due to its three point contact.

W2 Issue 14-8

634 OPTION 15 CHANGE NUMBER 57333

Ref: 634 Instruction Manual
070-2561-00

The 634 Option 15 functions between the scan rates of 675/60 and 1084/60. However, some problems have been encountered at scan rates near 675/60.

The range on the horizontal hold adjustment, R375, has been insufficient to synchronize the horizontal ramp. To correct this, R376 has been increased in value from 8.66K ohms to 12.1K ohms. The new part number for R376 is 321-0297-00.

Another difficulty encountered at these medium resolution scan rates has been that R352 tends to overdissipate and discolor. This only occurs during initial calibration before the horizontal size (R345), horizontal position (R355), and horizontal hold (R375) are adjusted. To reduce the likelihood of this occurrence, the physical size of R352 is being increased from a .25-watt part to a .5-watt device. The new part number for R352 is 307-0051-00.

W² Issue 14-9

1470 CABLE HARNESS CHANGE,
S/N B02000 AND UP

REF: 1470 Instruction Manual
P/N 070-2096-00

As a result of a modification to eliminate crosstalk problems in the main cable assembly of the 1470, one wire was removed from the harness and re-routed. The new main harness is P/N 179-2619-01 and the extra wire that is required for a complete replacement is P/N 175-3906-00. This separate cable goes from P516 on the Signal Generator board (Schematic 5) to P930 on the Phase Shifter board (Schematic 8). The wire is to be dressed along the outside edge of the

Signal Generator board from where it leaves P930 to where it arrives at P516.

W² Issue 14-9

1910 CPU RS232

RE: 1910 Operators Manual,
070-4466-00
1910 Service Manual, 070-4523-00

During a recent troubleshooting/repair cycle on a 1910, a technician had some difficulty getting the CPU to respond through the RS232 port. Replacing the board with a new unit from the factory did not cure the problem.

After setting his terminal to each of the four possible 1910 baud rates (300, 1200, 2400 and 4800) and repeatedly trying to gain control with CTRL C and CTRL T entries, the technician achieved RS232 communication at 4800 baud. The original CPU board was re-installed and a similar process was followed. The CPU finally answered and functioned normally.

The problem, in both cases, was most likely a CPU board that was programmed for 4800 baud - one from the customer's instrument, and one from the factory. In the factory's case, the replacement CPU board should have been shipped programmed for 300 baud, but apparently was not. The manufacturing area has been contacted with a request to insure that 300 baud is set into the replacement CPU board.

However, in the case of a customer's instrument, unless the servicing technician has knowledge of the baud rate that the customer is using, he will have similar problems getting the CPU to respond to the RS232 port. In the case of an unknown baud rate, the following procedure will allow the

(ARTICLE CONTINUED ON THE NEXT PAGE)

1910 CPU RS232 (CONT.)

technician to establish contact with a minimum number of iterations.

1. Connect a terminal to the RS232 Port.
2. Connect a 1910 RCU to the remote control port and depress the RS232 switch (or, if a 1910 RCU is not available, ground pin 17 of the Remote Control port).
3. Push either the 1910 Front Panel or RCU RESET button.
4. If the baud rate selected at the terminal is the rate expected by the CPU, the RS232 prompt (1910) will appear and the user can proceed.
5. If the prompt does not appear, change the terminal to the next baud rate that you wish to try (1200, 2400, or 4800), and go to step 3 (above).

This procedure should allow the technician to acquire communications with a functioning 1910 using a maximum of four attempts.

If RS232 comm still can't be established, set the terminal to 300 baud and go through the Manual's procedure for EEPROM initialization (page 5-10, Service Manual).

W2 Issue 14-10

1980 SERVICE KIT UPDATE

RE: 067-1115-01 Instruction Manual,
070-4508-00
1980 Service Manual, Vol. 1,
070-2921-00
1980 Service Manual, Vol. 2,
070-4494-00
Mods 53692, 51513

The 1980 Service Kit, 067-1115-00 has been upgraded to an -01 version to:

- allow 1910 capability
- insure compatibility with the new Video Data Converter assembly (672-1138-00).

The changes involved are:

- the addition of special signal PROM's for the 1910.
- the addition of patches to the VDC cal firmware.
- the deletion of 1900 special signal proms.
- the addition of some connectors (for the 1910) and
- the appropriate changes to the instruction manuals.

The upgraded kit is still fully compatible with the earlier versions of the Video Data Converter (672-0777-XX), and the calibration menu will prompt the user to enter the VDC type being calibrated.

For those users that have an earlier kit (067-1115-00) and wish to upgrade its capabilities for the new VDC-2, the following parts can be ordered and inserted into the indicated locations in the BASIC TEST PRGM board, 672-1084-00.

<u>Circuit #</u>	<u>Part Number</u>
U021	160-1788-00
U061	160-1789-00
U311	160-1790-00
U351	160-1791-00

The addition of these parts upgrades the circuit board to 672-1084-01.

There are some additional frequency response tests added with these parts that are usable on early and present VDC's.

For those users that have been using this kit with a 1900, and wish to change to a 1910, the four PROMs listed above should be ordered and installed. In addition, the following
(ARTICLE CONTINUED ON THE NEXT PAGE)

1980 SERVICE KIT UPDATE (CONT.)

parts must be ordered and placed in the indicated locations in the 1910 to provide the necessary special test signals.

<u>Circuit #</u>	<u>Part Number</u>
U870	160-2099-00
U872	160-2100-00
U880	160-2101-00
U885	160-2102-00
U890	160-2103-00

Two new connectors are specified for 1910 operation. P/N 131-0325-03 is for RS232 Enable and is electrically and mechanically the same as P/N 131-0325-02. (A label was added). P/N 131-0325-04 is for Digital Sweep Enable and can be ordered separately.

For the user that has purchased a 067-1115-01 kit, but only has access to a 1900, the special signal PROM's for the 1900 are no longer provided in the kit. The required parts can, however, be purchased separately as a kit, P/N 020-0882-00.

The revised manuals (Ref.) give the information necessary for the use of the kit, the new parts and specs involved, and the changes (parts lists and schematics) for the new VDC2.

W2 Issue 14-10

1980/4105 COMPATIBILITY

REF: Applications Manuals for --
 Opt. 1, 061-2331-00
 Opt. 2, 070-4328-00
 Opt. 3, 070-4317-00
 Opt. 4, 070-4655-00
 Opt. 5, 070-4757-00
 Opt. 6, 070-4791-00

1980 Terminal Driver Manual,
 070-2922-00

4105 Programmer's Reference Manual, 070-4526-01

A recent field call pointed out a small compatibility problem when the 4105 is used as the master terminal for the 1980.

The basic problem is:

- Setting the 1980 up for the proper terminal type.
- Setting the 4105 up so that dialog does not overwrite graphics.

The solution is relatively simple. During the 1980 initialization sequence for any given Application package (Opts. 1-6), the user is requested to enter the terminal type. In this case, initialize the 1980 to expect a 4010 series terminal. In addition, go to the "Set-up" mode in the 4105, and disable the dialog area by entering DAENABLE NO. The 4105 will now emulate a 4010 terminal, which has no dialog area. The alphatext will be displayed at the proper position in the graphics area.

Consult the appropriate product manuals (Reference) for further information.

W2 Issue 14-9

4014/4114/4054/GMA 19" SERIES, INTERMITTENT DVST WIRE HARNESS

A batch of 19" DVST's recently manufactured, may have intermittent wire harness at the flood gun sockets. Symptoms would be poor flood gun coverage and areas on the CRT with lower intensity and hard copy.

For a short period of time the pins in the flood gun socket, on the wire harness, were accidentally stretched by an incorrect fixture.

(ARTICLE CONTINUED ON THE NEXT PAGE)

4014/4114/4054/GMA 19" SERIES,
INTERMITTENT DVST WIRE HARNESS (CONT.)

The following CRTs may be affected:

154-0761-50	4014-1, 4015-1
154-0762-52	4014, 4015
154-0779-52	GMA101
154-0785-52	GMA102, 4054X, 4114X
154-0845-51	GMA103, 4054X, and 4114X Option 31

To repair the wire harness socket, remove the tape at the top and bottom of the CRT bell to expose the flood gun sockets. If removal of the seven pin sockets from the CRT is real easy (feels loose), replace the sockets with the new ones. Unsolder the pins and replace with P/N 136-0660-00.

W2 Issue 14-8

4170 HARD DISK FORMAT FAILURE

Several 4170 instruments with internal Winchester hard disks have been demonstrating a failure which causes the 4170 to address the hard disk as a floppy disk drive. This may occur after formatting the hard disk. After execution of "STAT C:" command, the results of the STAT command may indicate 314K bytes available instead of 8128K bytes. This failure is not due to a hardware failure, but to a "bug" in 1.1 version of the CP/M operating system software. The solution is to get a copy of the 1.2 version CP/M operating system software and type in

A>FORMAT C:

right after power-up. It is very important that the "FORMAT C:" is the first thing executed on the system after power-up. If it is not the first execution, the 4170 may poll the Winchester and recognize it as a floppy again.

W2 Issue 14-9

4170 AND 4926 HARD DISK NYLON WASHER
REMOVAL

Ref: 4925 Dual 5.25-inch Flexible Disk Drive and 4926 10M Byte Hard Disk Drive Manual, (Part Number 070-4688-01), pages 5-13

Some of the Winchester hard disk drives from Seagate are still being shipped with nylon washers installed between the mounting screws of the Hard Disk Control Board. The nylon washers must be removed. If they are present, the hard disk will be intermittently operable or totally inoperable when installed in either 4170 or 4926.

Please refer to the 4925 Dual 5.25-inch Flexible Disk Drive and 4926 10M Byte Hard Disk Drive Manual (Part Number 070-4688-01), pages 5-13, for exact location of washers.

W2 Issue 14-9

4695 HARDCOPIES FROM THE 4107/4109

REF: Volume 4, issue 2 of Softalk

The 4107 and 4109 produce larger 4695 copies than the 4105. The 4107/4109 copies are in landscape format with the long side of the image matched with the long side of the paper. The image of a 4107/4109 copy covers a 10.5 x 7.9 inch area. If you try to copy a full 4107/4109 screen onto a regular sheet of 8.5 x 11 inch paper (or transparency) you will have a problem.

Feeding the paper into the 4695 uses up about one inch of paper. The 4695's paper out indicator comes on when there is still more than an inch of paper left. This only leaves about 9 inches of paper for the image, rather than the 10.5 inches the 4107/4109 needs.

Here is a solution. Before sending your image to the terminal, reset the

(ARTICLE CONTINUED ON THE NEXT PAGE)

4695 HARDCOPIES FROM THE 4107/4109
(CONT.)

viewport to make a smaller image on the screen. Here are the commands that set the maximum-sized image that fits on the paper:

In Setup: *VIEWPORT 800 300 4095 2771

From Host: <EC>RV"K&H5ot?_

(<EC> indicates the escape character [ASCII decimal 27].)

Of course, if the entire image is in segments, you could issue the VIEWPORT command after the image is on the screen and hit the S Eras key to get the same results.

The 4695's paper out indicator will still come on. Press Cancel on the 4107/4109 to make the indicator go out and to stop the copy process.

Most overhead projectors can handle an image no greater than about 9 x 9 inches. For transparencies, you will probably want to set a viewport smaller than the one indicated above.

Note that the dialog area is not affected by this process and will copy at its normal size.

Don't forget that all 410X terminals can produce a small, quarter-sized copy on request. On the 4107/4109 this produces an image on the paper of about 5.25 x 4 inches.

W2 Issue 14-9

4907 FIRMWARE VERSION 1.4

REF: 4907 File Manager Service Manual
P/N 070-2405-00
Corporate Mod #52677

Firmware Version 1.4

Firmware for the 4907 has recently been upgraded to Version 1.4. This

change consists of nine programmed 2716 EPROMs and a minor hardware modification to the circuit board. This corporate mod was effective with 4907 S/N B014234.

A parts replacement kit, P/N 050-1160-03 has been set up and is currently available for Version 1.4 firmware.

The hardware modification to the ROM board consists of soldering a one inch length of insulated wire between pins 7 and 10 of U521. This must be done when installation of Version 1.4 firmware occurs.

All Firmware Versions

Listed below are the part numbers and checksums for all versions of 4907 firmware.

Firmware checksums for the 4907 ROM board can be obtained by using the 067-0746-00 Systems Test Fixture. For details on this procedure, please refer to the File Manager Service Manual.

Please note that to verify P/N 160-2632-00 (U641), install the microcircuit in one of the other ROM sockets (U271 recommended), then verify the checksum. Be sure to return the ROMs to their respective sockets.

(ARTICLE CONTINUED ON THE NEXT PAGE)

4907 FIRMWARE VERSION 1.4 (CONT.)

		FIRMWARE VERSION LEVELS				
		VI.0	VI.1	VI.2	VI.3	VI.4
Ckt	start addr	P/N & level Cksms	1vl Cksms	1vl Cksms	1vl Cksms	P/N & level Cksms
U121	A000	156-1067-00 CF CF	-00 CF CF	-00 CF CF	-00 CF	160-2624-00 41
U131	A800	156-1068-00 9F 2B	-00 AE 2B	-00 AE 2B	-01 28	160-2625-00 F8
U141	B000	156-1069-00 64 64	-00 64 64	-00 64 64	-00 64	160-2626-00 85
U151	B800	156-1070-00 A1 A4	-00 5D A4	-00 5D A4	-01 7C	160-2627-00 FF
U161	C000	156-1071-00 C1 C1	-00 C1 C1	-00 C1 C1	-00 C1	-00 C1
U201	C800	156-1072-00 E8 E8	-00 E8 E8	-00 E8 E8	-00 E8	-00 E8
U211	D000	156-1073-00 5A 5A	-00 5A 5A	-00 5A 5A	-00 5A	-00 5A
U221	D800	156-1074-00 39 39	-00 39 39	-00 39 39	-01 35	160-2628-00 4F
U231	E000	156-1075-00 79 79	-00 79 79	-00 79 79	-00 79	-00 79
U241	E800	156-1076-00 47 47	-00 47 47	-00 47 47	-00 47	-00 47
U251	F000	156-1077-00 AA AA	-00 AA AA	-00 AA AA	-00 AA	160-2629-00 D3
U261	F800	156-1078-00 0E 0E	-00 0E 0E	-00 0E 0E	-01 68	160-2630-00 9B
U271	6000 6800	156-1079-00 5B 6C 5B 6C	-00 5B 6C 5B 6C	-00 5B 6C 5B 6C	-01 7F 7F	160-2631-00 B9 B9
U541	N/A	156-0940-09 N/A	-14 N/A	-14 N/A	N/U N/A	N/U N/A
U631	8000	156-0960-06 E3 N/A	07 76 N/A	08 C6 N/A	N/U N/A	N/U N/A
U641	*	N/U N/A	N/U N/A	N/U N/A	N/U N/A	160-2632-00 6B
Board Level		670-5385-00	-01	-02	-04	-06

The abbreviations below are used with the chart.

- Cksm = (with patch) (without patch)
- N/A = Not Applicable
- N/U = Not Used
- U541 = FPLA
- U631 = Patch ROM

To get checksum without patch, remove the FPLA.
Firmware Versions 1.3 and 1.4 do not use a patch ROM and therefore do not have a "w/o patch" checksum.

W2 Issue 14-9

4907 119-0977-05 STRAP CONFIGURATIONS

REF: 4907 File Manager Service Manual
P/N 070-2405-00
4907 File Manager Installation Guide
P/N 070-2493-00
119-0977-04 Strapping (upgrade to 119-0977-05)
P/N 070-4980-00
Corporate Mod #46160

NEW LSI BOARD

Shugart has a new LSI board for their 8 inch flexible disk drives. The new board is being shipped in the 119-0977-05 which is being used in the 4907 and other products. The new board is Tektronix P/N 118-1004-02 and is electrically identical to the existing board; they are both interchangeable in the disk drives. Some of the strap options and test points are in different locations. There is also a new group of wire jumpers used with this new board.

ALL DRIVE BOARDS

With this article I will attempt to summarize the strapping parameters, wire set connections and board layouts of the different drives used in the 4907. Table 1 shows drive history.

(ARTICLE CONTINUED ON THE NEXT PAGE)

4907 119-0977-05 STRAP CONFIGURATIONS
(CONT.)

<u>Drive P/N</u>	<u>Board P/N</u>	<u>Comments</u>
119-0977-00	118-0358-01	Original discrete board
119-0977-01	118-0358-02	Second discrete board with mod
119-0977-03	118-1004-01	First LSI board
119-0977-05	118-1004-02	Second LSI board (current)

Note: Missing suffix levels were never shipped.

Table 1.
Drive History

<u>STRAP</u>	<u>DRIVE 0</u>	<u>DRIVE 1</u>	<u>DRIVE 2</u>
T2	IN	IN	IN
T1,T3,T4,T5,T6	*(1)	*(1)	*(1)
DS1	IN	OUT	OUT
DS2	OUT	IN	OUT
DS3	OUT	OUT	IN
DS4	OUT	OUT	OUT
HL *(2)	OUT	OUT	OUT
DS *(2)	IN	IN	IN
DS/HL *(5)	DS	DS	DS
DS/E1/HL *(3)	DS	DS	DS
D *(4)	*(4)	*(4)	*(4)
DC	IN	IN	IN
A	IN	IN	IN
B	IN	IN	IN
C	IN	IN	IN
Z *(2)	OUT	OUT	OUT
Y/Z *(5)	NONE	NONE	NONE
Y/EZ/Z *(3)	NONE	NONE	NONE
X	OUT	OUT	OUT
Y *(2)	OUT	OUT	OUT
800 *(2)	OUT	OUT	OUT
801 *(2)	IN	IN	IN
800/801 *(6)	801	801	801
L *(2)	OUT	OUT	OUT

- *(1) These jumpers are strapped in on the drive which is electrically the furthest from the main cabinet. This is usually Unit 1.
- *(2) This strap is on the 118-0358-01, -02 boards only.
- *(3) This strap is on the 118-1004-02 board only.
- *(4) On the 118-0358-01, -02 and the 118-1004-01 boards connect P8 to this double pin set with the wire on the side toward the inside of the board. The 118-1004-02 board has nothing on these pins.
- *(5) This strap is on the 118-1004-01 board only.
- *(6) This strap is on the 118-1004-01, -02 boards only.

WIRE INSTALLATION INSTRUCTIONS

For: 118-0358-01,-02

The wire harness shown in Figure 1a is currently used for both versions of the non-LSI boards. Following is the procedure for connection of this wire harness.

(ARTICLE CONTINUED ON THE NEXT PAGE)

Table 2.
Commented Strap Info

4907 119-0977-05 STRAP CONFIGURATIONS (CONT.)

Refer to Figure 4 for locations of the wire to be attached in the following procedures.

- 1) Place P-7 of this wire harness (shown in Figure 1a) on the board so connector pins 1 through 5 go over the square pins which connect to edge connector pins 2 through 10.
- 2) Place P-8 of the wire harness on pin set D of the board so the wire of P-8 is connected to the square pin which is toward the inside of the board.
- 3) Solder the 9-1 wire to the through hole connections to pin 3 of IC 2F.
- 4) Solder the 9-2 wire to the middle square pin of the NP/WP pin set.
- 5) Solder the 9-3 wire to the through hole located between ICs 3C and 3D (see Figure 4).

For: 118-1004-01

Refer to Figure 5 for locations of the wire to be attached in the following procedures.

- 1) Place P-7 of the wire harness (shown in Figure 1a) on the board so connector pins 1 through 5 go over the square pins as shown in Figure 5.
- 2) Place P-8 of the wire harness on pin set D of the board so the wire of P-8 is connected to the square pin which is toward the inside of the board.
- 3) Solder the 9-1 wire to the through hole connecting to pin 13 of IC 4B.
- 4) Solder the 9-2 wire to the WP square pin of the WP/NP pin set.

- 5) Solder the 9-3 wire to the through hole located between ICs 2A/3A and the LSI IC as shown in Figure 5.

For: 118-1004-02

Refer to Figure 6 for locations of the wire to be attached in the following procedures. Refer to Figure 2 for description of the wires used in this procedure. Note that the 198-5099-00 wire is not used in the 4907.

- 1) Solder the stripped-lead end of the 196-1158-00 wire to the feedthrough connected to pin 13 of IC 2A.
- 2) Connect the other end of the 196-1158-00 wire to the square pin connected to Pin 6 of the edge connector as shown in Figure 3 below.
- 3) Connect the single-pin-connector end of the 198-5098-00 wire to the square pin connected to Pin 2 of the edge connector as shown in Figure 3.
- 4) Connect the other end of the 198-5098-00 wire (double-pin) to the square pin labeled Z of the Y/EZ/Z jumper so the other side of the double-pin connector is left open (not on a square pin).
- 5) Check that one end of the 196-1159-00 wire is soldered to the feedthrough connected to the WP side of the NP/WP square pads.
- 6) Connect the other end of the 196-1159-00 wire to the square pin connected to Pin 4 of the edge connector as shown in Figure 6.

(ARTICLE CONTINUED ON THE NEXT PAGE)

4907 119-0977-05 STRAP CONFIGURATIONS
(CONT.)

ADDITIONAL WIRING

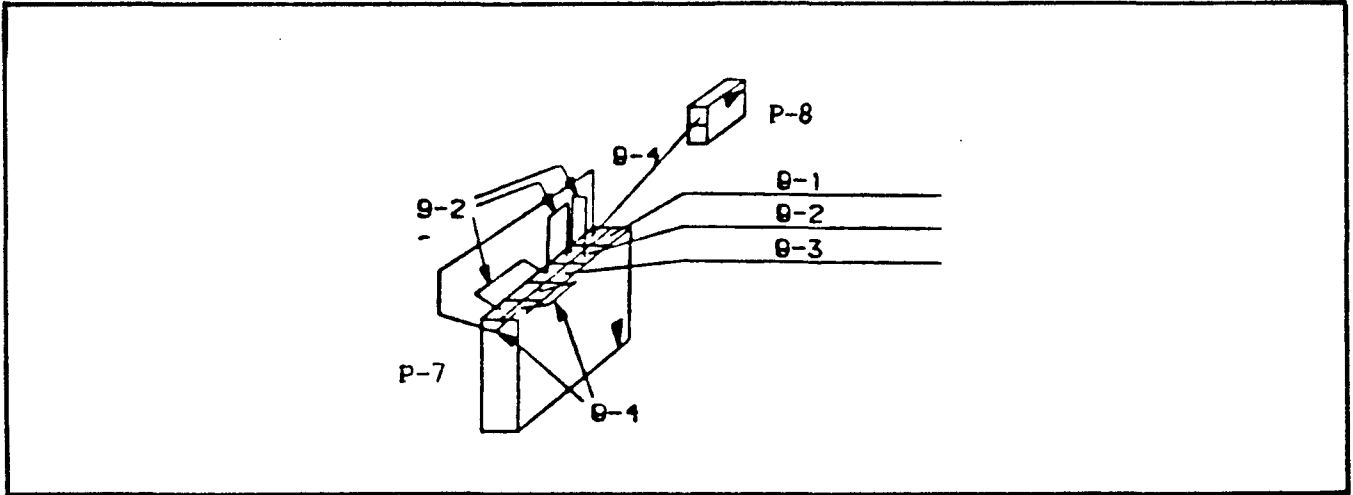


Figure 1a.
Wire Harness for 118-0358-01, -02 and 118-1004-01

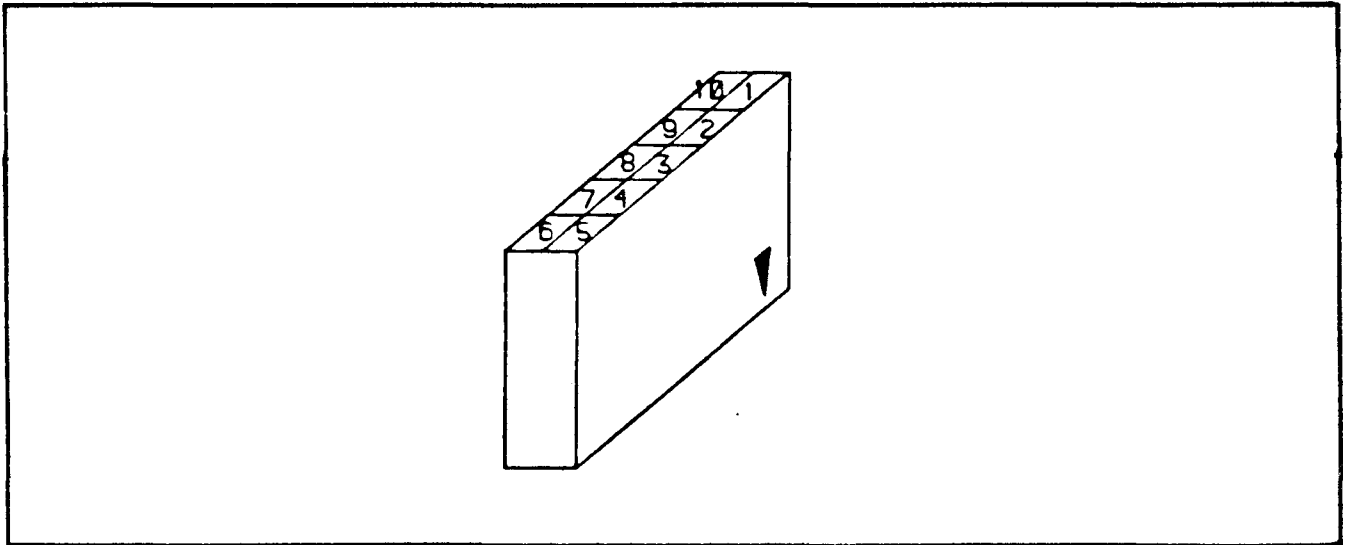


Figure 1b.
Wire Housing Pin Numbers

(ARTICLE CONTINUED ON THE NEXT PAGE)

4907 119-0977-05 STRAP CONFIGURATIONS
(CONT.)

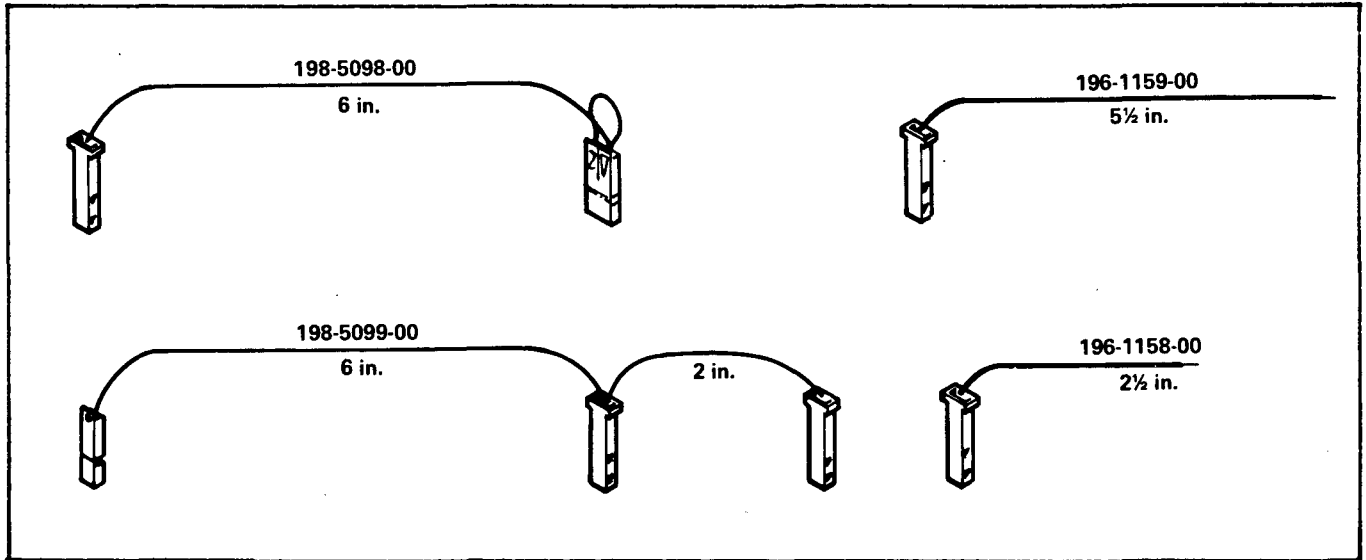


Figure 2.
Wire Set for 118-1004-02

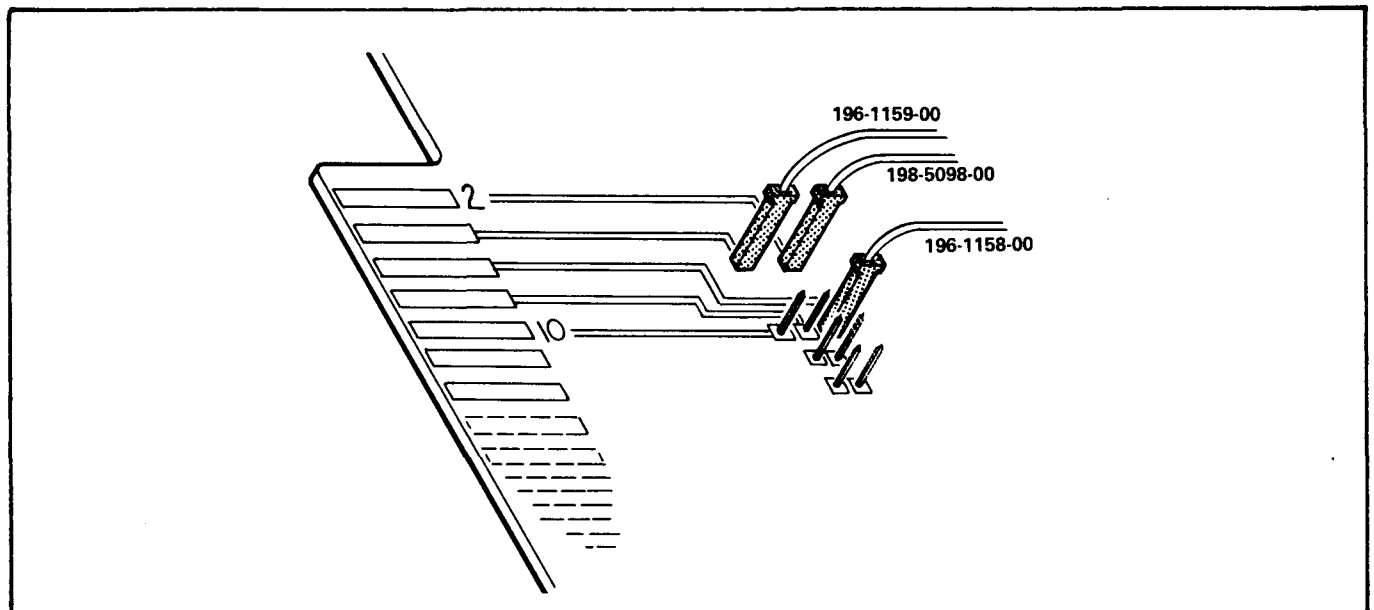


Figure 3.
118-1004-02 Wire Set Edge Pin Connections

(ARTICLE CONTINUED ON THE NEXT PAGE)

4907 119-0977-05 STRAP CONFIGURATIONS
(CONT.)

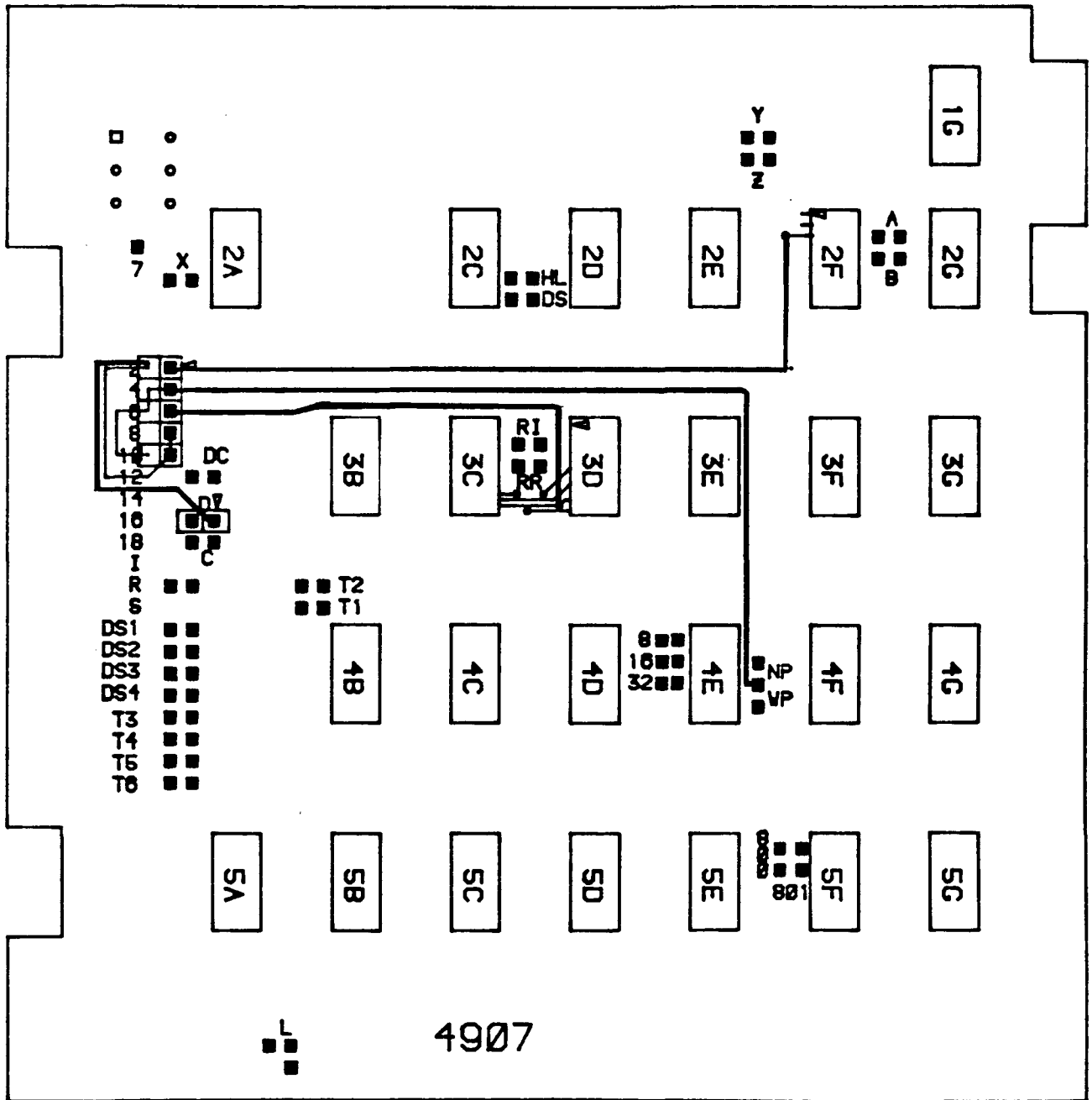


Figure 4.
Board Layout for 118-0358-01, -02

(ARTICLE CONTINUED ON THE NEXT PAGE)

4907 119-0977-05 STRAP CONFIGURATIONS
(CONT.)

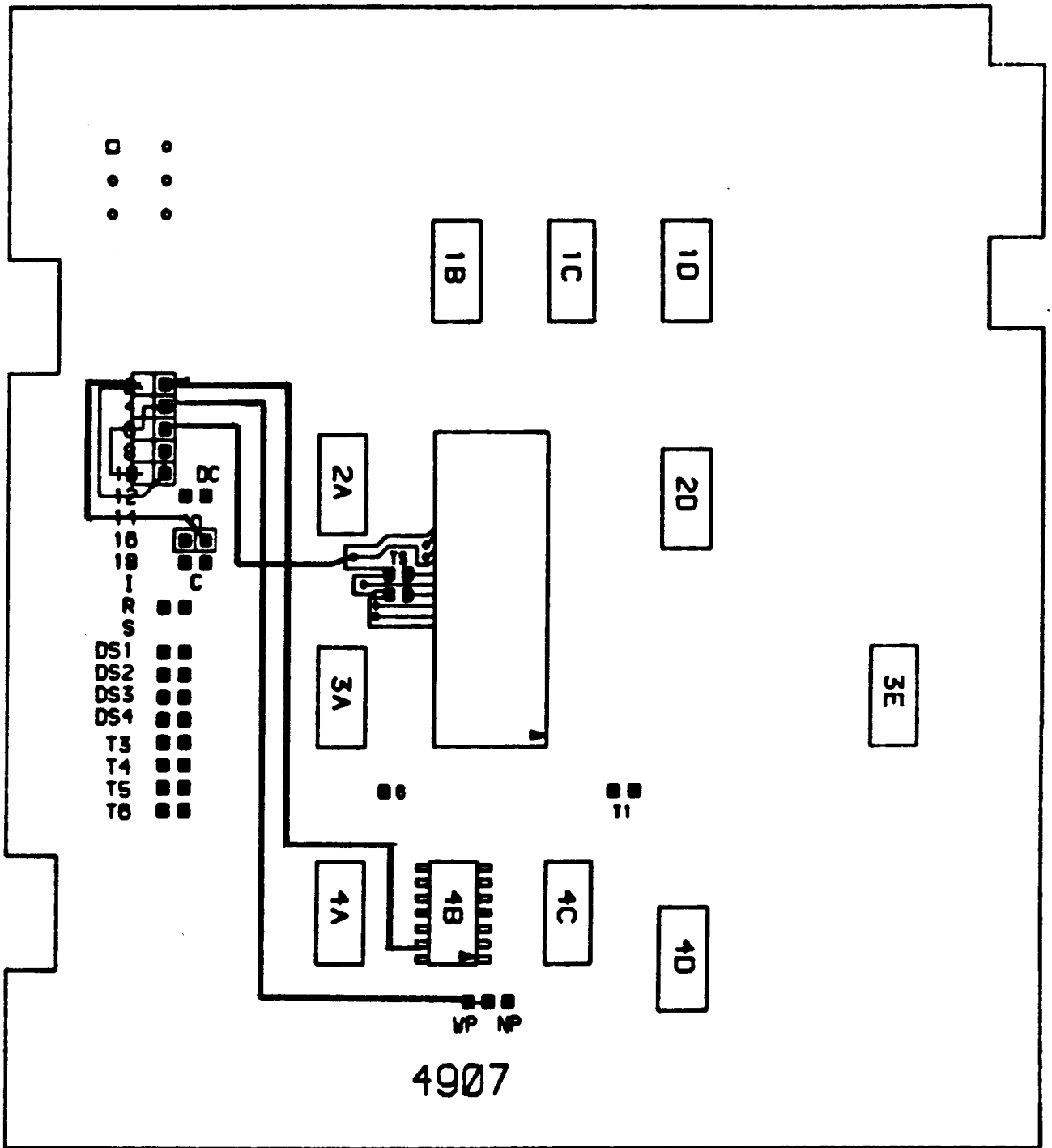
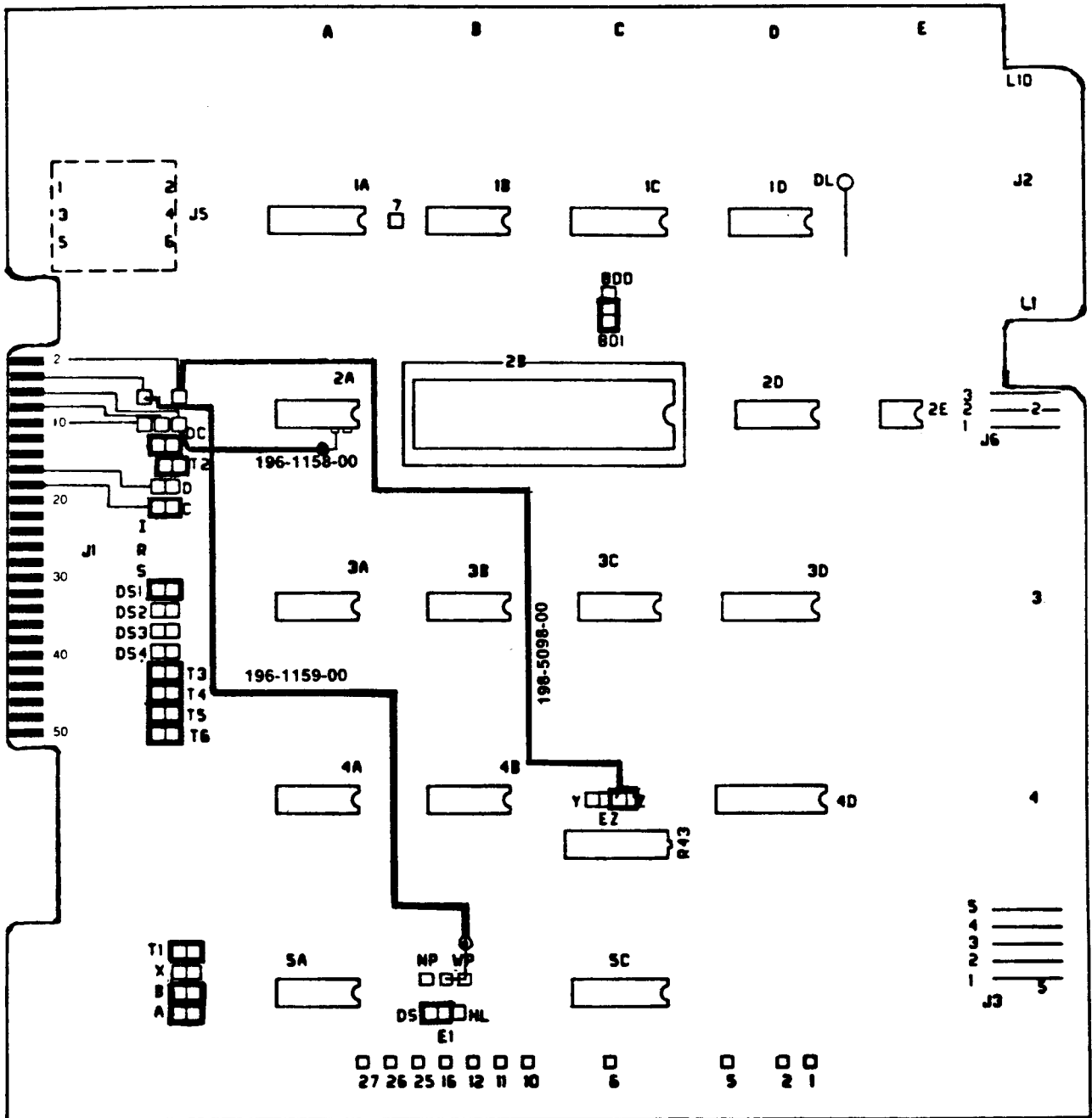


Figure 5.
Board Layout for 118-1004-01

(ARTICLE CONTINUED ON THE NEXT PAGE)

4907 119-0977-05 STRAP CONFIGURATIONS
(CONT.)



4907

Figure 6.
Board Layout for 118-1004-02

W² Issue 14-9

4909 CONTROLLER POWER SUPPLY

REF: 4909 System Service Manual
P/N 070-3998-00

Many intermittent or unusual malfunctions and errors can be caused to occur when a -00 or -01 power supply is installed in a 4909. The 4909 Controller Power Supply must be a 620-0295-02, -04 or above. (There was no -03 shipped.) The latest version is an -05 and is recommended unless circumstances dictate differently. Under no circumstances should an -00 or an -01 be installed!

W2 Issue 14-8

The Tektronix Service Organization firmly supports a policy of assuring continued utility of products sold by Tektronix.

This publication is meant to provide technical information to the customer who has decided to maintain his own Tektronix products. It contains product servicing information and is written for the technician.

Articles are submitted primarily by Corporate Service Support & Planning Personnel thoroughly familiar with the products they support. SERVICE TEKNOTES also encourages you to submit articles for publication. If you have knowledge of a technique, procedure or idea that enables you to service your Tektronix product more effectively, write it down so others may benefit from your experience.


Articles for publication should be submitted directly to:

Tektronix, Inc.
P.O. Box 500
Beaverton, Oregon 97077

Attention: Janet Hemenway
SERVICE TEKNOTES Editor

Delivery Station: 53-037

SERVICE TEKNOTES is distributed by Service Administrative Support free of charge to customers who maintain their own Tektronix equipment. A customer may be added to the distribution list by applying through his local Tektronix Sales Engineer.

Copyright ©1981, Tektronix, Inc. All rights reserved. Printed in U.S.A. Tektronix products are covered by U.S. and foreign patents, issued and pending. Information in this publication supersedes that in all previously published material. Specification and price change privileges reserved. TEKTRONIX, TEK, SCOPE-MOBILE, and  are registered trademarks of Tektronix, Inc. TELEQUIPMENT is a registered trademark of Tektronix U.K. Limited.

The Editor and staff of SERVICE TEKNOTES provide the material in this publication as a service to users of Tektronix Products. While we have tried to be diligent in assuring the accuracy of the material which we have printed, we cannot guarantee its accuracy. Neither SERVICE TEKNOTES, its editor and staff, Tektronix, Inc., nor its representatives assume any responsibility for the use of the material printed in SERVICE TEKNOTES; nor can we assume any responsibility for any errors or for the resulting effects of any errors.