Tektronix
COMMITTED TO EXCELLENCE

COMBINATION EDITION

Wizards Workshop

ALL SERVICE QUESTIONS FROM EUROPE, MIDDLE EAST, AND AFRICA SHOULD BE ADDRESSED TO THE TEKTRONIX EUROPE B.V. SERVICE GROUP IN THE NETHERLANDS.

TEKTRONIX INTERNAL USE ONLY

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Editor's Corner

by Sharon Huetson

NEWS OF WIZARDS WORKSHOP

HI,

This is the last time I will be writing to you via the "Editor's Corner". As Service Administrative Support continues to grow we are adding more personnel to better serve you.

I would like to introduce our new editor JANET HEMENWAY. Janet has an excellent background in publication layout and we feel fortunate to have found her within Tek. You may reach Janet on Ext. 8940 Merlo or 642-8940. She will be responsible for the majority of our Service publications. One of her first projects has been the January thru July 1981 W² Master Index. This is in printing now and will be distributed within the next week.

Our new Distribution Clerk is JOANIE STEWART who replaced Martha Taylor. Joanie can also be reached on Ext. 8940 Merlo or 642-8940. She is responsible for maintaining all distribution lists for our Service Publications. If you need to add or delete someone, add or delete copies, need extra copies, got too many copies? -- call or write to Joanie and she will assist you.

We have also added to our staff a Field Publications Writer, DEIRDRE MITCHELL. Deirdre comes to our department with a degree in Journalism and a background in writing procedures. Her main responsibility will be to formulate the Management Information Library for the field (an aid to convey service policies and procedures).

I will continue to maintain the SQI as well as supervise our Maintenance Agreement and Publications staff. Look for bigger and better things from us! As one of our first projects we will soon be reformatting the W² to meet the new divisionilization standards of the company. So - look for a "new look" in the W². Please feel free to continue to use me as a focal point for questions. If I don't know the answer - I'll find it.

-- Sharon

PERSONNEL CHANGES

Dan Dent has been named as the U. S. National Service Manager. He will be responsible for the U. S. Field Service organization and the Service Operations group in Beaverton. Dan will assume his new responsibilities in Beaverton effective October 4 and will report to me.

Dan's previous positions with Tek include District Service Manager in Boston, and his most recent position as Eastern Region Service Manager in Rockville. Prior to joining Tek in 1977, he was a Region Service Manager with Docutel Corporation.

I am very pleased to have Dan in this new position and I am sure that, with his leadership, the Service Organization will continue to meet the challenge. I know each of you join me in wishing Dan every success in his new job.

Stan Kouba
Corporate Service Manager

***

It is my pleasure to announce the selection of John Toftemark as the Eastern Region Service Manager. John is a 16-year Tek employee who has had experience in positions from Technician to Supervisor, Field Engineer, Service Center Manager, District Service Manager, Region Field Service Manager, and most recently, Region Service Operations Manager.

John will begin his new duties as RSM in Rockville immediately with responsibility for the Eastern Region Service operations, reporting to me in Beaverton.

I am sure you will all want to join me in congratulating John on his promotion.

--Dan Dent
56-069 Ext. 8947 MR

***

FRED ZINDA

Fred Zinda has accepted the position of managing the Beaverton Board Exchange Center. Fred is a graduate of Portland State University with a B.S. in Psychology. His educational background also includes programming and electronics engineering. Fred has had a variety of management positions. His most recent was with the Storage Technology Group.

***

PAUL KRYCHO - ET-II, ALBUQUERQUE

Paul comes to Tektronix following a career of 24 years in the U.S.A.F.

Welcome Paul!

KENNETH WHITTEN - ET-I, BOSTON

Ken comes to Tek from the U.S.A.F. after specializing in Avionics Systems Technology and having experience as a weapons control system mechanic.

Welcome Ken!

***

MATT GRAZIER - FSS-I, SANTA CLARA

Matt joined Tek after retiring with 20 years of military service combined between the U.S.A.F. and the U.S. Navy.

Welcome Matt!

PROMOTIONS

DAVE CUMLANDER

Dave has been promoted to Field Senior Service Specialist. His new duties will include Technical Support and Territory Management for the Oregon and S.W. Washington area. Congratulations Dave!

JIM SPEROS - BOSTON

Jim has been promoted to IDD Field Supervisor in the Boston Field Office. He has been with Tektronix over three years fulfilling the position of Inventory Support Supervisor in Boston. Congratulations Jim!

***

MIKE SMAROFF - ROCKVILLE

Mike has accepted the position of Product Support Specialist for Systems in the Eastern Region starting in AP 205. Congratulations Mike!

--Editor

STATIC AWARENESS BULLETIN: NEW VIDEO TAPE

A new video tape expressing current understanding of electrostatics is now available. This tape, Static Awareness Update 1981 (P/N 068-0131-00), completely replaces the older "Static Awareness" tape. The new tape is designed to be viewed by all employees regardless of technical competence, although, some understanding of component names is necessary.

The protective mat recommended for use when handling discrete devices, circuit boards, and assemblies is P/N 006-3414-00 for bench tops and P/N 006-3417-00 for portability in Field Service. The 006-3417-00 comes with a wrist strap and ground connecting cord, but, the 006-3414-00 will need the 006-3415-00 wrist strap to complete the work station. Both kits include instructions for proper installation. The main points for use are:

1. Never defeat the personal protection resistors in the wrist strap cable and the protective ground cord.

2. Never work on a protective mat without wearing a properly connected wrist strap.

--Tom Fox
53/108, Ext. 8697

STOLEN INSTRUMENTS (INTERNATIONAL)

The following instrument has been reported by Tektronix Europe B.V. as missing.

Product	Serial Number	Location Missing From
466 Opt. 10	B149993	Customer in Norway

If this instrument appears in your service area or you have any information regarding it, please contact the Service Support group in Tektronix Europe B.V. (formerly EMC).

--Editor
56-037, Ext. 8940

SUBPARTS OF TIMING CAPACITOR SETS CAN BE ORDERED SEPARATELY

Users of Tek-made, hermetically sealed timing capacitor sets should be aware that subparts of sets can be ordered directly form the Capacitor Manufacturing department.

If any one of the subparts 285-0000-xx part numbers is needed, call ext. 4576, Beaverton DR, and send the part. In many cases, we can give same day delivery or even hand carry if on Beaverton campus.

--Reprinted from Agenda

VIDEO TAPES NOW AVAILABLE FOR SERVICE TECHNICIANS

These new video tapes can be obtained from the Publications Department (74/115) on a loan basis for 60 days. Tapes must be returned within 60 days or a cost transfer charge will be made.

- STATIC AWARENESS - UPDATE '81 12 min. P/N 068-0131-00

  Well done tape, sends a strong message of the evils of static discharge.

- 4643 ELECTRICAL ADJUSTMENTS 13½ min. Tek internal use only

  Excellent tape describing unique electrical adjustments.

- 4643 DISASSEMBLY - ASSEMBLY 53 min. Tek internal use only

  Long tape; however, well done. Each step in the disassembly is keyed. Therefore, a viewer does not have to view entire program. Manual can be used as guide in the process.

-- Submitted by
Dick Hornicak
54/077, ext. 8843

KELITE SPRAY WHITE

Kelite Spray White can be obtained either from Customer Service in a one gallon container, P/N 006-0535-00, or from Allied Kelite Products in 15 and 55 gallon containers. Allied Kelite Products main distributor locations are:

EASTERN

81 Industrial Road
Berkley Heights, NJ 07922
Phone: 201-464-1400
Telex: 710-984-7986

MIDWESTERN

2400 East Devon
Desplaines, IL 60018
Phone: 312-297-3570
Telex: 910-233-4004

WESTERN

1250 North Main Street
Los Angeles, CA 90012
Phone: 213-222-0201
Telex: 910-321-2833

INTERNATIONAL

Contact the Midwestern U.S. distributor at Telex 910-233-4004 for your local distributor. You can also place your order through this office.

--Tom Fox
53/108, Ext. 8697

WELLER FUSE PROBLEM

Some Weller soldering stations, P/N 003-0955-00, were shipped with a 1.5 AMP fuse. The correct fuse is 3 AMP's and can be ordered from CSG.

Description	Part Number
Fuse 3 AMP Cartridge with wire ends	159-0015-01

--Tom Fox
53/108, Ext. 8697

ADMINISTRATIVE SUPPORT

The following article is being reprinted as a courtesy and apology to both Bill Duerden and our readers. In the last issue our proofreading department (me) was asleep at the switch and this article contained many errors. Please discard old copy and replace with this new "error free" copy.

-- Sharon

SERVICE RECORD PROCEDURES - FAILURE CODES

Failure codes must be reported for all component failures regardless of activity code.

When service records arrive without failure codes, Reliability Information Services must assign failure codes in order to expedite data entry. They do this based on information in the comments written on service record. This process not only takes a considerable amount of time, which helps create a large backlog for data entry, but could distort failure data.

THE TECHNICIAN PERFORMING THE SERVICE IS THE BEST SOURCE OF THE DATA.

Failure codes are listed in Sections 700C1 and 700C2 of the Field Reference Manual (FRM). They are also printed periodically in the Wizard (see Issue 11-15).

Ensure the actual hours reported against a product are correctly totaled and entered into the service record. These hours are used in doing labor analyses of product services which lead to the establishment of average hours for repair and calibration. Service record labor reporting has an influence on the setting of maintenance agreement prices.

Probes should be reported by product type nomenclature whenever possible. Enter the probe type in the "Product Type" block of the service record instead of the part number.

-- Bill Duerden
56-037
Ext. 8938

SERVICE RECORDS - MODULE EXCHANGE INFORMATION COPY

The Module Exchange Center is receiving a great number of "Module Exchange packets" of Service Records for repairs in which there was no module exchange involved.

Do not forward the Module Exchange Information copy of the Service Record unless an exchange module was used in the product repair.

--Bill Duerden
56-037, Ext. 8938 MR

TM 500

DM502A dB ADJUSTMENT

When beginning Step 10 on Page 4-14 of the DM502A adjustment procedure, it should be noted the dBm/dBv jumper should be in the dBv position. If adjustment Steps 10 through 15 are made with the jumper in the dBm position, the dB reference voltage and other dB adjustments will be in error.

Submitted by Hiram Springer, Philadelphia.

--Terry Turner
92-236, Ext. 1288

TG501 HIGH SPEED DIVIDER IMPROVEMENT

SERIAL NUMBERS AFFECTED: Standard, under B037780; Option 01, under B037830

REFERENCE MOD NO.: M43700

If A1U315 is a Signetics brand chip, the TG501 may not output 5ns,2ns, and 1ns markers. It was discovered that A1Q330, ECL to TTL level shifter had poor high frequency gain. The signal level from the Signetics IC is somewhat lower than the Motorola brand and did not provide enough drive to A1Q330 in all cases.

To cure this problem A1Q330 was changed from 151-0410-00 to a 151-0188-00. The new device has better high frequency gain and is compatible with all IC's.

--Terry Turner
92-236, Ext. 1288

7000 SERIES

PROPER REPAIR REPORTING INFORMATION

It is imperative that Service Records be filled out concisely and accurately, to determine whether a serious failure trend or isolated incidents are occurring. This is why on Service Records, for instruments with many boards, and with the new manual part numbering format, complete information must be entered. On instruments such as the 7854 and 5223, the board number must precede the component circuit number. Service Support and the Business Units review every Service Record you fill out.

For example; U200 on the R.O.M. board in the 7854 should be entered as A31U200. Components that are chassis mounted or mechanical parts not associated with a specific circuit board, are not required to have a board prefix.

Also under the Problem Description/Action Taken, the entries must be brief and concise, because the computer picks up only the first 30 characters. With good, accurate, legible, information generated from these Service Records, appropriate action can be started to solve reliability and quality problems.

--John Eaton
53/108, Fxt. 8689

145M CRYSTAL, 158-0039-00

For the next 3-4 months, please return any failed crystals, 158-0039-00, to me for failure analysis.

--Bill Bean
53/108, Ext. 8695

147A/149A INSTRUCTION MANUAL P/N 070-2029-00 - MAINTENANCE NOTES

Instructions to change from standard 147A to Option 1.

For those customers owning a standard 147A and desiring to have it modified to a 147A Option 1, the following procedure is provided.

PARTS REQUIRED

Part Number	Description	Quantity
334-1914-00	Label	1
333-1458-08	Panel, Front	1
334-1377-00	Label	1

PROCEDURE

1. Open LOCAL/REMOTE plug (P9014) and cut wire strap between Pins 21 and 24 (if installed). Add Opt. 1 Label (334-1914-00) to plug cover, reassemble and re-connect to 147A.

2. Change front panel VITS plate to new Opt. 1 part (333-1458-08).

3. Re-time the following horizontal instant wires on the Horizontal Timing Board A2 (670-1471-00).

Wire Color	Housing Color	From	To
9-07	0	15	16
9-07	1	15	16
9-12	3	17	18
9-13	0	18	19
9-15	4	20	21
9-16	0	21	22

4. Type "Option 1" on the remaining label (334-1377-00) and attach it to the rear panel near the serial number tag.

5. Inspect your work, apply power, test and calibrate as necessary.

--Bill Bean
53/108, Ext. 8695

147A/149A LAMP HOLDER, 136-0079-00

The front panel lamp holder, 136-0079-00, is no longer available. When replacement is required, a 136-0279-00 will be used. This will require the use of a different incandescent lamp. Use a 150-0045-00 lamp with the new holder.

--Bill Bean
53/108, Ext. 8695

147A/149A MANUAL P/N 070-2029-00 - MAINTENANCE NOTES

Instructions to change standard 149A to Option 1.

For those people presently owning a standard 149A and wishing to have it changed to a 149A Option 1, the following procedure is provided.

PARTS REQUIRED

Part Number	Description	Quantity
131-0621-00	Connector	2
152-0008-00	Diode, Ger.	1
152-0141-02	Diode, Sil.	1
315-0332-00	Resistor, 3.3K .25W 5%	1
321-0249-00	Resistor, 3.83K .25W 1%	4
321-0265-00	Resistor, 5.62K .25W 1%	1
321-0322-00	Resistor, 22.1K .25W 1%	1
321-0329-00	Resistor, 26.1K .25W 1%	1
333-1689-03	Tag, Front Panel	1
334-1377-00	Tag, Identification	1
334-1914-00	Tag, Remote Plug	1
352-0171-08	Connector Holder, 1 Pin, White	2
352-0171-09	Connector Holded, 1 Pin, Grey	1
	#26, 9-45 Wire, 14" Long with 131-0621-00 on one end	1

BUILD PROCEDURE

Refer to the 147A/149A Instruction Manual (P/N 070-2029-00) for the following items:

1. Modify the function Generator Board (670-2039-XX) ◇14◇ & ◇15◇ as follows--

   A. Change R6119 from 715K to 22.1K (321-0322-00)
   B. Change R6910 from 34.8K to 26.1K (321-0329-00)
   C. Re-stamp board to read 670-2039-16

(ARTICLE CONTINUED ON THE NEXT PAGE)

2. Modify the Output Amp. Board (670-2042-XX) ◇17◇ as follows--

   A. Change R7461 from 6.19K to 3.83K (321-0249-00)
   B. Change R7581 from 6.19K to 3.83K (321-0249-00)
   C. Change R7551 from 3.16K to 3.83K (321-0249-00)
   D. Change R7553 from 3.16K to 3.83K (321-0249-00)
   E. Re-stamp board to read 670-2042-13

3. Modify the Sync and Subcarrier Out Board (670-1477-00) ◇19◇ & ◇20◇ as follows--

   A. Change R490 from 1K to 3.3K (315-0332-00)
   B. Add a 131-0621-00 connector to the anode ends of each diode (152-0008-00), (152-0141-02). (Use #48 connector crimping tool.)
   C. Remove 9-36 wire from P498-4 and insert 152-0008-00 crimped end into slot 4 just vacated. Solder free end of 9-36 wire to free end of diode. (See Fig. 6-3, Page 6-5.)
   D. Insert crimped end of 152-0141-02 diode into P498-5 and solder 9-45 wire supplied with kit to free end of 152-0141-02.
   E. Dress 9-45 wire along rear of instrument to right side, through hole in chassis, to Function Generator Board (670-2039-16) P6035. Put crimped-on connector on 9-45 wire into P6035-1.
   F. Restamp board to read 670-1477-02.

4. Modify Horizontal Timing Board (670-1471-XX) ◇5◇ & ◇6◇ as follows--

   A. Change R2720 from 10.0K to 5.62K (321-0265-00)
   B. Re-stamp board to read (670-1471-00)
   C. Re-set the instant timing wires on the board as follows:

	WIRE COLOR	PLUG COLOR	FROM	TO
1.	9-5	1	5	6
2.	9-08	2	17	10
3.	9-05	0	14	12
4.	9-12	1	18	14
5.	9-12	2	18	14
6.	9-15	1	21	16
7.	9-15	2	21	16
8.	9-18	2	24	18
9.	9-18	0	24	18
10.	9-25	0	27	20
11.	9-25	1	27	20
12.	9-7	0	7	23
13.	9-8	3	8	24
14.	9-01	0	10	26
15.	9-02	1	11	27
16.	9-04	0	13	29

(ARTICLE CONTINUED ON THE NEXT PAGE)

	WIRE COLOR	PLUG COLOR	FROM	TO
17.	9-4	0	4	23
18.	9-07	1	16	31
19.	9-07	0	16	5
20.	9-34	3	31	21
21.	9-5	2	5	21
22.	9-05	1	14	30
23.	9-16	0	22	6
24.	9-34	1	31	15
25.	9-12	3	18	17
26.	9-13	0	19	18
27.	9-5	4	5	23

5. Retime the instant wires coming from the main cable to the Horizontal Timing Board as follows--

   A. Move 9-03 with black housing from 12 to 27
   B. Remove 9-8 wire from P2130-6, add grey housing and connect to instant 25
   C. Remove 9-07 wire from P2330-4, add white housing, and connect to instant 30
   D. Move 9-12 wire with red housing from 18 to 28
   E. Remove 9-02 wire from P2130-9, add white housing, and connect to instant 25
   F. Move 9-18 wire with orange housing from 24 to 30

6. Change wiring on Multiburst switch (S9250) as follows--

   A. Remove O-N wire going from switch to ground lug
   B. Add wire strap with insulation to switch such that P6904-2 is connected to -15 volts at all times (refer to ◇22◇)

7. Add new VITS plate (333-1689-03) to front panel.

8. Open REMOTE/LOCAL plug and cut out strap between Pins 21 and 24.

9. Reassemble remote plug and add tag (334-1914-00) to outer surface.

10. Type "Option 1" on Identification tag (334-1377-00) and attach to instrument near serial number tag.

11. Calibrate according to manual, with changes on Page 6-3 accounted for and make appropriate entries in service documents, etc.

--Bill Bean
53/108, Ext. 8695

650 SERIES ANODE CAPS

Reference: Mod #40414

Due to an anode cap redesign and the subsequent updating of the HV power supply assembly, those of you replacing this unit (119-0320-06) with a new one (119-0320-07) may experience some difficulty with the removal of the new anode cap.

A new Anode Cap Remover tool is required for the new assembly. Order P/N 003-0891-00 where needed.

--Bill Bean
53/108, Ext. 8695

670 CRT NUMBER

The 670 Series CRT (154-0712-XX) vendor number, for those of you wishing to use a commercially available CRT tester, is 470BEB22.

--Bill Bean
53/108, Ext. 8695

670 SERIES POWER SUPPLY CURRENTS

The following matrix lists nominal currents to be expected in the 670 Series power supply.

	P8075	P8070	P8065	P8060	P8055
+ 5	20mA	18mA	230mA	70mA	115mA
-15	40mA	560mA	180mA	175mA	60mA
+15	75mA	970mA	72mA	180mA	125mA
+120	80mA	125mA	38mA		7.5mA

--Bill Bean
53/108, Ext. 8695

1450 SERIES SAW AMP BIAS

A higher than average failure rate has been noticed with respect to A24Q85 (151-0223-00) on the Narrow band SAW Amp Board (670-5004-01). Two possible symptoms are:

a) Intermittent gain variations that get worse with increasing temperature. This is most noticeable in Manual Gain mode.

b) No video out.

Previously, R76 on the A24 or A25 SAW Amp Board was adjusted for minimum intermodulation distortion. This pot(s) controls bias current through Q85. Setting these pots fully clockwise to obtain minimum intermodulation distortion can allow a power level in Q85 that approaches or exceeds the manufacturer's specifications. Since these pots (R76) have very little effect on intermodulation distortion, we are recommending that they be turned fully counterclockwise and left in that position.

This change will not compromise the intermodulation or frequency response specs. A mod has been submitted to have these pots replaced with fixed resistors on all instruments coming out of production.

--Submitted by
Ed Kiyoi, TV Engineering

--Inserted by
Bill Bean
53/108, Ext. 8695

1480 SERIES -- 152-0488-01 DIODE RELIABILITY

For the next 3 to 4 months, please forward any failed diodes, 152-0488-01, to me for analysis. They are used in the 1480 Series as CR 6010, CR 6210, and CR 6310.

--Bill Bean
53/108, Ext. 8695

1980 FIRMWARE UPDATE - ANSWER SERVICE BULLETINS #12 AND #14

A kit is now available to upgrade ANSWER operating systems from version 1.1 to version 2.1. Any ANSWER system with a B01XXXX serial number may have the version 1.1 operating system. All units shipped after May 8, 1981 contain version 2.1 and are numbered B020142 and up.

The most noticeable advantage to version 2.1 is the reduction (by more than half) in the time required to load programs. Other improvements have been included in the terminal driver that will make it easier for the user to enhance his system with additional programs.

Order kit number 050-1531-00, which is available at a reduced price until September 21, 1981. Contact TV Marketing for details. Units under warranty or maintenance agreement will be upgraded at no charge.

The upgrade affects two boards, the CPU (A10) and the operating system ROM/PROM (A28). The two initialization EPROM's on the CPU board will be replaced (U031 and U032), and 24 EPROM's are replaced on the ROM/PROM board. In addition, two EPROM's (U011 and U051) and a PLA (U461) on the ROM/PROM are removed. Return parts removed to Bill Bean, Service Support, 53/108.

An instruction sheet is included in the 050 kit that contains enough detail to allow the service technicians to make the changes.

CAUTION --Observe standard static-sensitive precautions when working on this modification.

Some power-up and diagnostic routines may exhibit some changes. Figure 1 shows the initial power-up diagnostics readout that hasn't changed. Figure 2 shows the SYS VID: (formerly SYSTEST VID:) print out. Note the absence of FPULSE, CLKSW and DVMVAL checks.

Figure 3 shows the print out from SYS FIRM (formerly SYSTEST FIRM). Note the absence of a patch and the listing of the operating system as version 2.1.

Call Larry Harrington on Ext. 3414 with any questions pertaining to Firmware/ Software operation and Bill Bean on Ext. 8695 (Merlo Road) for your service concerns.

(ARTICLE CONTINUED ON THE NEXT PAGE)

FIGURE 1

```
1980 SELF TEST
--------------
CPU  -DONE
RAM  -DONE
FIRM -DONE
ROM: -DONE
TT:
     -DONE
NUM: -DONE
VID: -DONE
TESTS COMPLETE

READY
*
```

FIGURE 2

```
SYS VID:
VID:
 SETUP  OK
 FBMEM  OK
 MLATCH OK
 CSTATE OK
 FBLOOP OK
 FBINCR OK
 DVMRST OK
 WAVMEM OK
 CSTADR OK
 CARSIZ OK
 CSAVE  OK
 CSKIP  OK
 CINSTR OK
 DITHER OK
 OFFSET OK
 GAIN   OK
 DCSAMP OK

READY
*
```

(ARTICLE CONTINUED ON THE NEXT PAGE)

FIGURE 3

NAME	VER.REL	ADDR	CONDITION
SYSCTL	2.1	00	OK
SCHED	2.1	20	OK
DATMAN	2.1	21	OK
MTHPAK	2.1	22	OK
EVAL	2.1	23	OK
SYSCOM	2.1	24	OK
CMDSUP	2.1	25	OK
STACOM	2.1	26	OK
EDITOR	2.1	27	OK
IOCOM	2.1	28	OK
CLKFIL	2.1	29	OK
GRAPH	2.1	2A	OK
GRAFIX	2.1	2B	OK
MESCM1	2.1	2C	OK
MESCM2	2.1	2D	OK
MEASUP	2.1	2E	OK
MESCLC	2.1	2F	OK
MESRNG	2.1	30	OK
RFFT	2.1	31	OK
TTDRV	2.1	32	OK
TTSUP	2.1	33	OK
VDRIV	2.1	34	OK
VDIAG	2.1	35	OK
NVDRV	2.1	36	OK
TTINT	2.1	37	OK
01AAML	1.1	40	OK
01BBML	1.1	42	OK
01CCML	1.1	44	OK
01DDML	1.1	46	OK
01EEML	1.1	48	OK
01FFML	1.1	4A	OK
01GGML	1.1	4C	OK
01HHML	1.1	4E	OK
01IIML	1.1	50	OK
01JJML	1.1	52	OK
01KKML	1.1	54	OK
01LLML	1.1	56	OK
01MMML	1.1	58	OK
01NNML	1.1	5A	OK
01OOML	1.1	5C	OK
01PPML	1.1	60	OK
01QQML	1.1	62	OK
01RRML	1.1	64	OK
01SSML	1.1	66	OK
01TTML	1.1	68	OK
01UUML	1.1	6A	OK

READY
*

Field Service Kits and other inventories can be upgraded in the field, using the 050-1531-00 kit, only where a 1980 unit exists to verify the affected boards. Otherwise, return the affected boards to the Board Exchange Center for updating. *Update your boards* ASAP.

(ARTICLE CONTINUED ON THE NEXT PAGE)

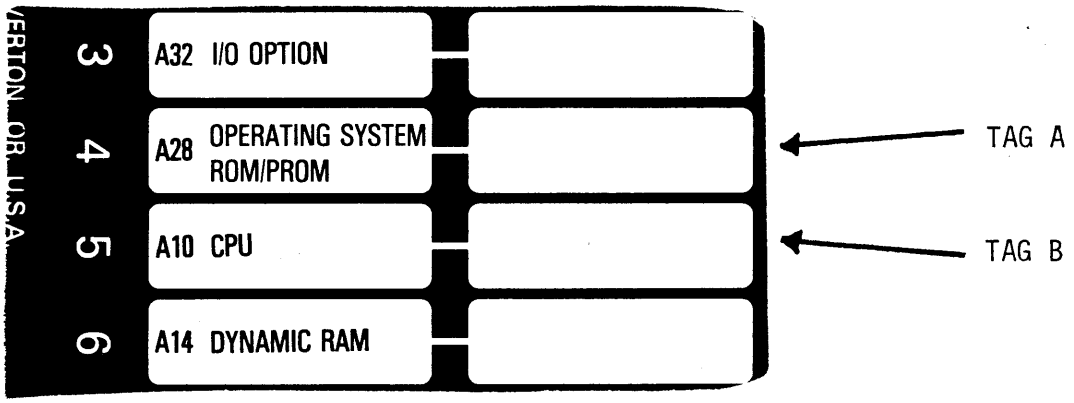
ADDENDUM

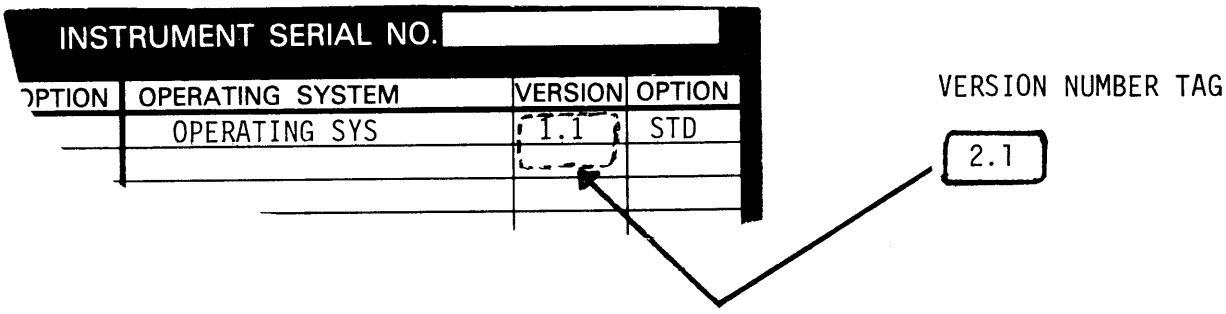
Due to an oversight, front door label considerations were missed when the version 2.1 firmware update kit (050-1531-00) was put together.

In order to allow the front door to accurately reflect the contents of the various boards, it will be necessary for the service technicians involved with the 1980 to obtain some tags (334-1377-00) and type the following information onto them.

Tag A	672-0778-02
Tag B	672-0780-01

Affix these tags to the front door label as indicated below. In addition, a small adhesive-backed tag should be placed over the operating system version number and "2.1" entered on the tag to accurately reflect the new firmware. (See examples.)





These details will be taken into account in any future changes.

--Bill Bean
53/108, Ext. 8695

1980 SOFTWARE PATCHES - ANSWER SERVICE BULLETIN #13

The following software "patches" are being used to correct various faults in the version 1.X operating system. They won't be necessary for version 2.X. To be used, load them into Non-Volatile Memory using the SAVE NVMØ: Command as per the Operator's Manual and Program Reference Manual.

1. Temporary fix so that BRSTCRSS will not always assume that burst is unlocked and corrects some initialization parameters.

   (See Figure 1)

2. Corrects an omission which causes fatal errors when writing out modem phone numbers to NVM, and corrects some initialization parameters.

   (See Figure 2)

3. Corrects vertical blanking ±.5 line error and also allows more reliable identification of Canadian multiburst signals.

   (See Figure 3)

4. Corrects "Quiet Line Not Found" message which caused a fatal error.

   (See Figure 4)

5. Corrects defect which never marked the modem as being disconnected. Without this patch, the MONITOR & REPORT program would dial the modem once, send the report, hang up the modem, and not remember that it hung up. The modem, therefore, would never be dialed again, and the remaining reports would never be received.

   (See Figure 5)

6. Corrects chrominance-luminance crosstalk error.

   (See Figure 6)

7. Corrects individual measurement error.

   (See Figure 7)

8. Corrects group measurement error.

   (See Figure 8)

(ARTICLE CONTINUED ON THE NEXT PAGE)

FIGURE 1

```
11001 ! TIMNSE.PCH 11-NOV-80
11285 I=OH-OL
11290 K=(CA(BC-I)+CA(50-I))/2\CO$(S+7)='\MS(S+7)=0
11300 LVLSCN CA(0:BC-I),K,4,1,L,-1\IF L=-1 THEN L=BC-20-I
11310 LVLSCN CA(BC-I:200-I),K,4,1,R\IF R=-1 THEN R=BC+20-I
11330 BRSTCRSS V(0:31,L-28:R+8),MC*TG,RAD(360),J,A,SC(8),SC(9),N
11340 IF A<MC*GN*TG THEN 11400
11540 I=ITP(ABS(P-8-SC(DL(1))-M0)+.999)/192
11580 MNSTDV LA(16:31),J\IF CV$()'Y' THEN I=J-.2*BA*TG
11810 !
11850 SA(1)=FB(1)+16-(J+K)/16\SA(3)=1
11860 K=(K-J)*2/FB(2)\IF K<9 THEN K=256/31
11910 TA(J:J+511)=LA(0:511)-LA(512:1023)\NEXT J
12020 RETURN
12050 IF FE$(0)='DC' THEN WAIT 5
12160 CO$(79)='(PK-PK)'\RETURN
```

FIGURE 2

```
6001 ! INIT.PCH 11-NOV-80
11070 PRINT 1.1;TAB(T);'CONNECT FLAT FIELD SIGNAL';CR$
11080 CLOSE #5\OPEN #5 AS VID:\I=10\GOSUB 11120
11090 AP=A\I=90\GOSUB 11120
11100 AX=80/(A-AP)\AY=10-AX*AP
15005 BL=2
17010 BL=3\NT=23
```

(ARTICLE CONTINUED ON THE NEXT PAGE)

FIGURE 3

```
5501 ! MEASYS.PCH 11-NOV-80
7110 GOSUB 7190\A1=AP\L=257+FD\J=0\F=3-FD
7140 IF SM=5 THEN L=20\F=FD\J=16\GOSUB 7340\GOTO 7170
7205 IF EF=1 THEN 7220
7210 GOSUB 5000\PRINT #TT(0),CR$;'↑GSYNC LOST ON SOURCE ';SU$;' SYNC ';SY$
7215 P8=1
7340 PUT F,L,OV+OS,PV INTO #5,'VMC'
8020 MINMAX V(0,200:800),8,I\IF V(0,1)-V(0,8)<39 THEN CM=7\GOTO 8160
8021 MINMAX VA,S,I
8030 S=VA(I)-VA(BP)\MNSTDV VA(287:342),L\MNSTDV VA(740:768),R\D=(L-R)/S
8040 RESTORE 8190\N=3\IF ABS(D)<.26 THEN 8075
8050 RESTORE 8200\N=5\IF D>0 THEN 8080
8060 J1=FP\LVLSCN VA(0:J1),VA(J1)+S*.3,4,2,SC,-1
8070 RESTORE 8210\N=4\E=SC(1)\GOTO 8090
8075 IF (L-VA(BP))/S<.28 THEN 8160
8080 J1=BP\LVLSCN VA(J1:1023),VA(J1)+.82*S,8,2,SC\E=SC(0)
8190 DATA 3,0,0,5,1,1,7,-1,1
8200 DATA 4,0,0,13,-1,2,16,0,2,21,1,3,40,0,4
8210 DATA 16,0,0,23.5,-1,3,29,0,0,43,0,5
```

(ARTICLE CONTINUED ON THE NEXT PAGE)

FIGURE 4

```
16001 ! MAKEMS.PCH 11-NOV-80
16970 A$=VP$(6)&' NOT FOUND'\GOSUB 16110\GOSUB 9420\RETURN
```

FIGURE 5

```
11 ! MNITOR.PCH 11-NOV-80
35 PRINT TAB(9)!'FIRST REPORT IN 160 SECONDS'
735 TT$(3)='OFF'
```

FIGURE 6

```
11001 ! VITSMS.PCH 11-NOV-80
12200 R0=2*(DL(3)-Z)\SA(2)=FB(2)*256/(20+DG(2))
12290 MR(40)=ITP(DL(M)/R0/SA(2)*2000+.5)/10
```

FIGURE 7

```
11 ! MANIND.PCH 11-NOV-80
470 READ #6,U$,N$,C$,S$,T$,A9$,B$\IF Q$<>U$ THEN 470
510 A$=A9$\GOSUB 4500\IF B$<>'NO' THEN READ #6,LM\LN$=A$
```

FIGURE 8

```
11 ! MANGRP.PCH 11-NOV-80
430 READ #6,U$,N$,C$,S$,T$,A9$,B$\IF Q$<>U$ THEN 430
470 A$=A9$\GOSUB 4500\IF B$<>'NO' THEN READ #6,LM\LN$=A$
```

--Bill Bean
53/108, Ext. 8695

DATA COMMUNICATION ANALYZERS

834 - INTERRUPTS NOT BEING SENT

Reference: 834 Manual, Part Number 070-3399-00, Foldout 3
A1 Processor Board

The SIO chip, A1V211 (Part Number 156-1424-00), fails to send an interrupt to the microprocessor when the instrument is in HDLC mode. The problem has been found in chips marked code date 8043. Please check your stock for this code date and send these parts to Don Stalp, Delivery Station 78-092, Beaverton. Mark the R.S.O. "Reject, Attn: Walt Kirkbride" and re-order as necessary.

--Stan Uffner
92-236, Ext. 1564

LOGIC ANALYZERS

DAS 9100 SUPPORT

The DAS 9100 Series was recently introduced and currently includes the following instruments:

DAS 9109	P6452
91A08	P6454
91A32	P6455
91P16	P6456
91P32	

For technical assistance on DAS 9100 service problems, contact Pat Wolfram, 92-236, Ext. 1582.

Contact your Region Product Support Specialist or me for questions concerning DAS 9100 Series support policies.

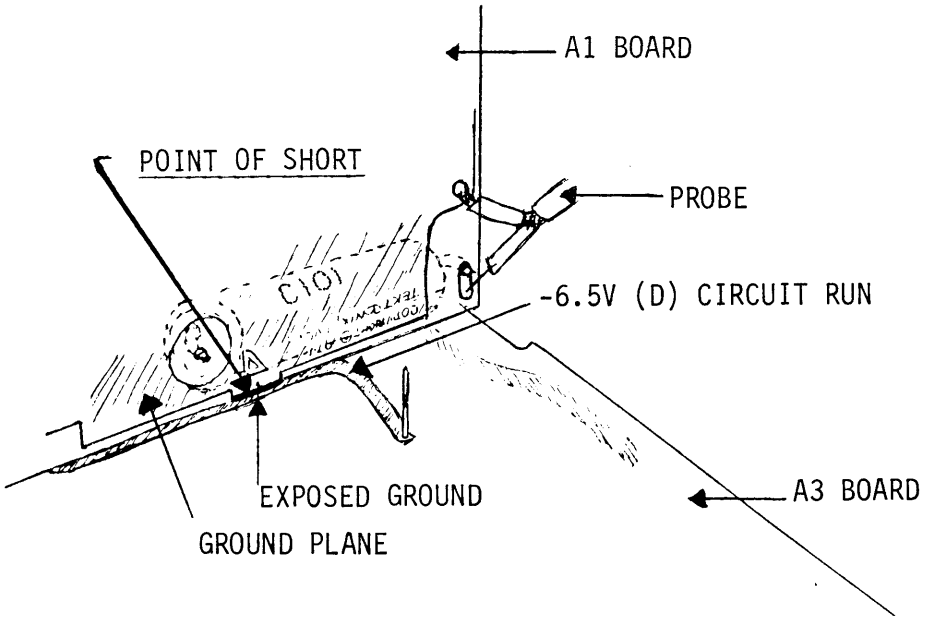
--Gary Ellsworth
92-236, Ext. 1611

213 -6.5V SHORTED

Reference: A1 and A3 Boards
Serial Numbers: B045112 & Below

The picture below illustrates where a short can possibly develop in the -6.5v supply. Manufacturing has changed the position of the power supply run to prevent this short from happening at approximately the serial number listed above. On instruments below that number, to protect the run from shorting, use insulation film, P/N 342-0213-01, cut to cover the run and double-sided tape, P/N 006-1342-00, to hold it in place. Apply small pieces of tape so as not to cover runs.

Thanks to Kenneth Quick, Atlanta Service Center, for bringing this to my attention and for the illustration.



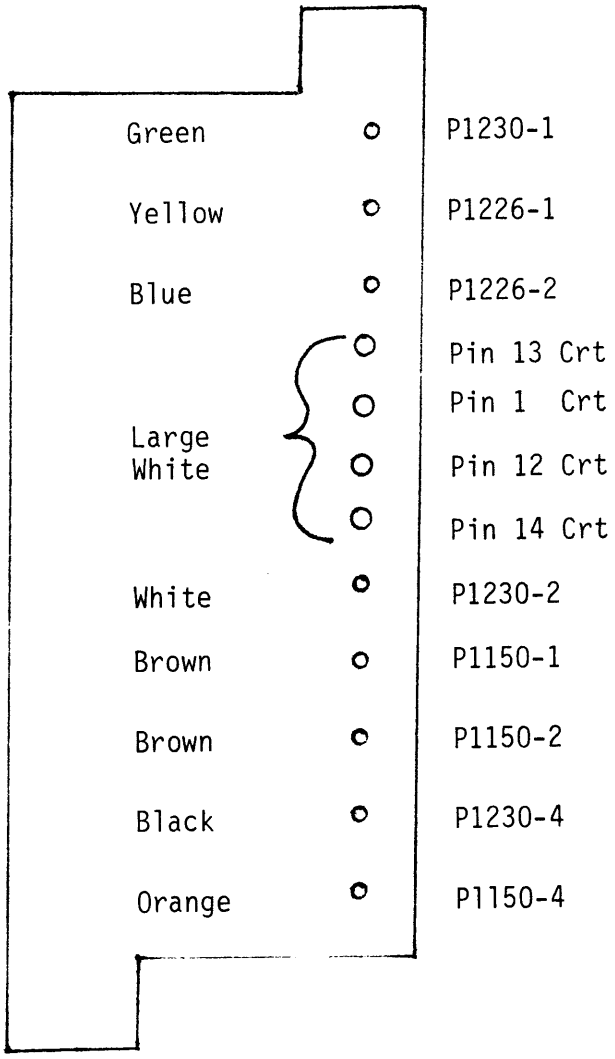
--Mike Laurens
53/108, Ext. 8688

305 H.V. MODULE WIRE LOCATION

Reference: CRT Circuit Schematic ◇10◇
P/N 119-1035-00/01 (The 01 is with connectors)

A new vendor for the H.V. module, Murata, does not number it's wires on the module as T.D.K. does. The drawing below shows the color and location of the wires.

The Murata module is black and red, whereas, the T.D.K. module is orange.



--Mike Laurens
53/108, Ext. 8688

465B--DELAY TIME JITTER TROUBLESHOOTING

A) Electrical Checks

Equipment: A Bench Scope capable of 1 mV/div sensitivity with a means of eliminating unnecessary High Frequency noise such as a Band Width Limit function. The best method is to use a 465 or 465B Bench Scope. Cascade the vertical channels by connecting CH. 1 output to CH. 2 input via 50 Ω cable and a low pass filter. (Described below.)

Low Pass Filter: On one of the female ends of a BNC "T" connect the parallel combination of a .01μf cap and a 50 Ω, 1% resistor from the center conductor to ground (the outer shield).

When looking for noise, learn to recognize erratic delay jitter causing noise as opposed to the normal background noise. In the power supply, noise which causes jitter can be high voltage noise, too much 60 Hz ripple, and/or erratic jumping caused by a noisy part. These problems may also cause other circuits trouble.

B) Preliminary Checks

1. "A" Trigger SLOPE should be in positive.
2. Check for loose hardware on the mother board, trigger board, etc.
3. Check standoffs under the high voltage shield and screws should be tight.
4. The ground strap from the high voltage shield ground to the preamp ground should be soldered and the shield should be cutting into the conductor.
5. If C7052 is in backwards, it should be replaced.
6. Wires from P6015 on the timing board should not be lying parallel to or in close proximity to the CH. 2 trigger coax. This causes crosstalk. To determine if this is a problem, pull the channel two trigger coax on the trigger board side. If the jitter improves, then move the wires as far apart as possible.

C) Other Checks

1. Check all power supplies for noise or ripple exceeding spec's. Common causes can be:

   a. 55 Volt supply
      1. VR4421
      2. VR4304
      3. U4411
      4. R4305, R4318, R4406

   b. Other power supplies
      1. The op amps
      2. Resistor in the reference voltage divider
      3. Any of the transistors

(ARTICLE CONTINUED ON THE NEXT PAGE)

2. Check the base of Q6034, and Q6036, if the noise is present here, the problem could be:

   a. R6053, R6052, R6056
   b. VR6057, VR6058

3. Check the base of Q6032 and the emmitters of Q6032 and Q6036, if noisy, could be:

   a. Q6032, Q6036, Q6034
   b. C6033
   c. R6044

4. Check to see if the timing resistor is causing the problem by moving "A" timing knob from 1 ms to 2ms. If the jitter doesn't increase by a factor of two, then the problem could be a timing resistor.

5. Check the base #2 of Q7067. If noise is present, then the cause could be:

   a. C7052
   b. R6019, R16002, R6012
   c. Also, it could be Q7076, Q7067, Q7074, Q7075
   d. In rare instances, one of the resistor in the above circuits or CR7072, CR7075

6. Check at Pin 6 Q7067 or the base of Q4563. If noisy here, it could be:

   a. R4573, R4570, R4574
   b. C4571, C4594

7. Check at the collector of Q4570, Q4598, if noisy here, it could be:

   a. Q4563, Q4564, Q4565, Q4566, Q4570
   b. Q4588, Q4497, Q4498, Q4598
   c. C4568, C4598
   d. In rare instances, the problem may be one of the resistors, capacitors or diodes in the associated circuits.

-- Mike Laurens
53-108, ext. 8688

2213, 2215 I.C. PART NUMBER CHANGES

Reference: A10 Main Board A13 Alternate Sweep Board
Serial Numbers: All

The part number of the following I.C.'s have changed:

	NEW	OLD
A10U315	156-0384-02	156-0384-00
A10U317	156-0388-03	156-0388-00
A10U607	156-0180-04	156-0180-00
A13U665	156-0382-02	156-0382-00
A13U670	156-0382-02	156-0382-00
A13U690	156-0385-02	156-0385-00

--Mike Laurens
53/108, Ext. 8688

2213, 2215 LOSS OF AUTO TRIGGERS AT 58MHZ

Reference: A10 Main Board, Schematic ◇4◇ Triggers
Serial Numbers: All

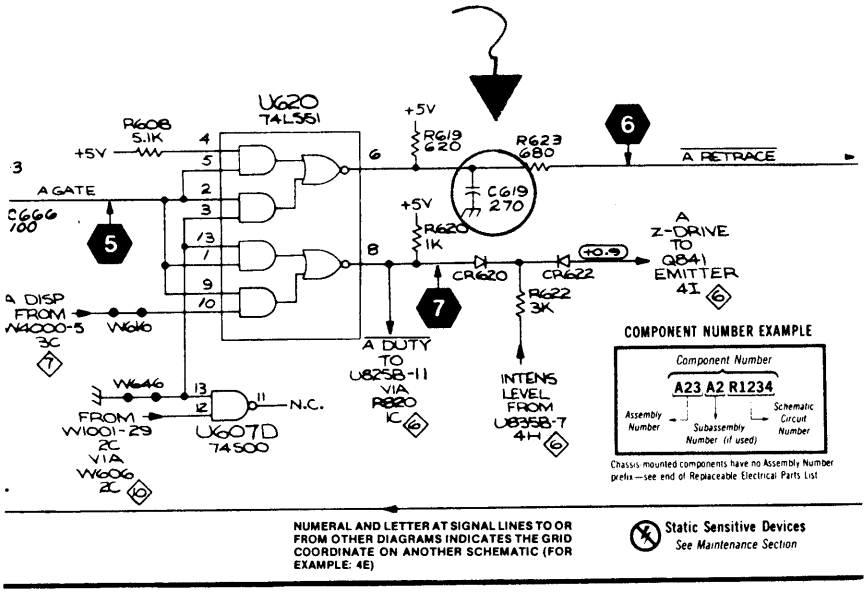
At 58MHz or greater the auto triggers may not work correctly causing loss of triggers and base line. Also, the trigger light may not function correctly. A10U640 changes to P/N 156-1195-00, which is a faster I.C. than the old part, to correct the 60MHz triggering.

--Mike Laurens
53/108, Ext. 8688

2213, 2215 5NS SWEEP START NONLINEARITY

Reference: A10 Main Board, Schematic ⟨5⟩ Sweep Gen and Logic
Serial Numbers: 2213 - B010300 and below
2215 - B011100 and below

The start of the sweep at 5NS/DIV may be bunched up and nonlinear. By removing A10C619, the point at which the unblanking occurs changes and the nonlinear part of the sweep is no longer displayed.



--Mike Laurens
53/108, Ext. 8688

IDD SECTION CORRECTIONS - ISSUE 11-16

In Issue 11-16 Table of Contents three titles were omitted. They are:

These titles will be indexed in the Master Index in January for your convenience.

Also, the article titled 4112/14, F42/43 DISK OPTION ADJUSTMENT begins and ends on page 21. This was written by Bill Hatch. A new article beginning on page 22 and ending on page 27 should have been titled 4114 DEMO UPGRADE. Our apologies to IDD Service Support. We sure had a bad week.....

--Sharon

4114 HISTORY OF BOARD AND ASSEMBLY PART NUMBERS

The following article is to help identify those boards that are beyond the -00 suffix. DO NOT try to use this information to modify any board. This information is incomplete and is to only be used as an aid in identifying the level of the board.

CURRENT BOARD AND ASSEMBLY NUMBERS FOR 4114 ONLY

119-1305-03 Keyboard
History:
-00 Not used in 4114.
-01 Not used in 4114.
-02 Not used in 4114.

119-1394-00 Keyboard (Swedish)

119-1395-00 Keyboard (APL)

620-0294-00 Pwr Supply

670-3097-01 Hardcopy Amp
History:
-00 Not used in 4114.

(ARTICLE CONTINUED ON THE NEXT PAGE)

670-4798-03 Pwr Supply Bd(display)

History:

-00 not recommended to be used with 4114.

-01 Reference; PICN #126

-02 Reference; PICN #126

Reason: To insure reliability

Changed:

(1) Changed C55 to 22ufd Capacitor (290-0718-00)

(2) Changed the micro circuit of U161 from 156-0700-00 to 156-0921-00.

(3) Changed F139 and F141 from 3AG,2A,250V,0.74 sec. fuse to 3AG,2A,250V,5 sec. fuse P/N 159-0023-00.

(4) Removed VR151 and C149

(5) Rolled 670-4798-01 to -03

670-5163-01 Interconnect

History:

-00 Not used in 4114.

670-6494-02 Display controller

History:

-00 Reference; PICN #47

Reason: To insure the latch is properly triggered.

Changed:

(1) Disconnect U460-1,2,4,5,7,8,9,12,16.

(2) Changed U460 from 74LS175 to a 74LS75.

(3) Connected U460-2 to U545-14, U460-3 to U545-13, U460-6 to U545-12, U460-16 to U560-15, U460-15 to U560-13, U460-4 and 13 to U565-11 and U360-2 ect., U460-5 to Vcc and U460-12 to Ground.

(4) Rolled 670-6494-00 to -01.

-01 Reference: PICN 118

(ARTICLE CONTINUED ON THE NEXT PAGE)

Reason: When the power is shut off on the 4611 the 4114 will hang.

changed:

(1) Cut and lift U420 pin 1 from board.

(2) Cut and lift U50 pin 11 from board.

(3) On the front of the board connect U525 pin 7 to U420 pin 1.

(4) On the front of the board connect U420 pin 1 to U50 pin 11. Route the mod wire under the grounded stiffener bar as much as possible to help hold the wire close to the board.

(5) Roll 670-6494-01 board number to -02.

670-6495-00 Vector Generator

670-6502-00 Regulator

670-6503-00 Inverter

670-6578-00 AC Distribution

670-6579-00 DC Distribution

670-7062-00 Mother Bd

670-7063-00 Mother Extender

672-0662-04 H.V. & Z-Axis
History:
-00 Not used in 4114.
-01 Not used in 4114.
-02 Not used in 4114.
-03 Not used in 4114.

672-0795-04 Double Erase Storage
History:
-00 Not compatible with 4114.
-01 Not compatible with 4114.
-02 Not compatible with 4114.
-03 Reference; PICN #110

(ARTICLE CONTINUED ON THE NEXT PAGE)

Reason: To change pulse shape and range of adjustment on CE-2. To make the board compatible with the color Write-thru tubes, also to change R276 which was over stressed, and increase reliability of the board.

Changed:

(1) Change R390 to 0.5 ohm in flood gun amplifier

(2) Added emitter follower on back of board to CE-2 amplifier

(3) Change R276 from 510 ohms to 620 ohms in erase waveform generator.

(4) Change insulators and heat sink to be compatible with insulators of Q15,25,35,45,55,65,75,85.

(5) Change R194 of CE-2 amplifier to 22.6K ohms.

(6) Rolled 672-0795-03 to -04

672-0901-01 Def. Amp
History:
-00 Not used in 4114.

672-0949-01 Processor
History:
Reference: Mod M44134

Reason: 8284 use in U155 is no longer available and is replaced by the 8284A.

-00 Changed:

(1) Replaced U155 with 8284 (156-1428-02).

(2) Added wire strap from U155-1 to U155-15.

(3) Rolled 670 and 672 part number to -01.

672-0950-02 RAM/ROM
History:
Reference: PICN 98, 128

Reason: 8202 causes intermittent soft RAM errors.

(ARTICLE CONTINUED ON THE NEXT PAGE)

-00 Changed:

(1) If the board has an 8202 and U193 does not have a piggyback IC, it is a 670-6940-XX/672-0950-00.

(a) Remove and replace U473 (8202) with an 8202A.

(b) Remove U193 (74S74).

(c) Insert R192 and R193 (131-0566-00, 0 ohm resistors)

(d) Rolled 670-6940-XX. Add 672-0950-02 sticker.

-01 Changed:

(1) If the board has an 8202 and U193 has a piggyback IC, it is a 670-6940-XX/672-0950-01.

(a) Remove and replace U473 (8202) with an 8202A.

(b) Remove U193 (74S74) and piggyback (74S04).

(c) Inserted R192 and R193 (131-0566-00, 0 ohm resistors).

(d) Rolled 670-6940-XX. Add 672-0950-02 sticker.

CURRENT COMMON BOARDS AND ASSEMBLY NUMBERS FOR 4110

670-6343-01 Tablet Controller

History:

-00 Reference: PICN #107

Reason: Tablet Board needed more adjustment on timing range.

Changed:

(1) Six pins and two jumpier straps were added along with the cutting of 32X and 32Y cut straps.

(2) Rolled 670-6343-00 to -01

(ARTICLE CONTINUED ON THE NEXT PAGE)

670-6591-00 Floppy Controller

670-6669-02 RAM Controller
History:

Reference: PICN 99, 129

Reason: 8202 causes intermittent soft RAM errors.

-00 Changed:

(1) If U535 does not have a piggyback IC.

(a) Remove and replace U451 (8202) with an 8202A.

(b) Remove U535 (74S74).

(c) Insert R538 and R539 (131-0566-00, 0 ohm resistors).

(d) Roll 670-6669-00 to 670-6669-02 and skip step -01.

-01 Changed:

(1) If U535 has a piggyback IC.

(a) Remove and replace U451 (8202) with an 8202A.

(b) Remove U535 (74S74) and piggyback (74S04).

(c) Insert R538 and R539 (131-0566-00, 0 ohm resistors).

(d) Roll 670-6669-01 to 670-6669-02.

670-6670-00 RAM Array

670-6671-00 3PPI

670-6709-00 Tablet Interconnect

670-7089-00 Current Loop

--Bill Hatch
63-503, ext. 3787

4611/4612: SHIPPING DAMAGE

We are still receiving reports of extensive damage because a 4611 or 4612 was shipped from the field improperly prepared or packaged. Please show this article to your shipping clerks and to CSRs who may be advising customers of how to return equipment to Tektronix.

1. REMOVE TONER -- use paper or card and rotate magnet so that toner will travel onto the paper; or remove the toner hopper with toner, place in a plastic bag and seal.

2. INSTALL FOAM BAND -- around the fuser assembly so it covers the backing electrodes. Do not latch the fuser assembly down, but put it down gently to protect the printing belt styli.

3. REMOVE THE PAPER -- to avoid damage from shifting paper and/or subsequent printing belt damage from a loose or misaligned roll of paper. (See Wizards Workshop issue 11-7, page 19.)

A new printing belt costs $60. Cleanup of a toner-filled unit costs $50-$100, with possible long term effects to bearings, gears, motor, and electrical performance.

Shipping carton, pads, and foam band may be ordered under part number 065-0328-00.

--Dan Harris
63/503, ext. 3313

4612, 4632: HARD COPY COMPATIBILITY TO THE 4112 TERMINAL

HARD COPY	INTERFACE	4112 REQUIREMENTS (See notes below)
4612 Standard (U.S. & Canada)	75 ohm coax-BNC	1
	15 pin cable, 012-0504-0X	1,2
4612, Option 3 and A1, A2, or A3 (Europe, U.K., Australia)	75 ohm coax-BNC	1,3,4
	15 pin cable, 012-0504-0X	1,2,3,4
4632 (Worldwide) Calibration of Timing Board usually required. See Note 6.	75 ohm coax-BNC	5
	15 pin cable, 012-0504-0X	2,5
4632, Option 6	75 ohm coax-BNC	1
	15 pin cable, 012-0504-0X	1,2

NOTES:

1. Option 11, External Video, is required.

2. The small black/white twisted pair cable must be connected to J307 on the External Video (Option 11) Board. (Early Option 11 installations left this cable on J287 Video Controller Board.)

3. Option A1 or A2 or A3 is required.

4. Strap J511 on External Video Board to the OUT position. If an external monitor is connected, this will distort the aspect ratio on the monitor.

5. Compatible with or without Option 11.

6. The standard 4112 video signal has timing characteristics similar to high resolution video signals.

--Dan Harris
63/503, ext. 3313

4631, 4632: PROCESSOR HEAT BAFFLE ADDED BACK IN

Reference: Wizards Workshop, Issue 11-9, Page 15; modification #42775.

Modification #43654 has installed the air baffle back into 4631 and 4632 processors only. Internal airflow peculiar to the "clamshell" cabinets directs air through the left side of the processor, causing fading of the copy along that side. The baffle is required to meet density specifications.

As stated in the referenced Wizard article, the baffle "has a negligible effect on copy quality", but only in rackmount cabinets (processors using a conveyor). The baffle should be removed from these processors whenever the opportunity arises.

We are looking into other means of solving the baffle "swallowing" problem. Baffles, P/N 378-2023-00, were temporarily not orderable because of the earlier mod. CMS will accept your orders for them now, with parts available by October 15, 1981.

--Dan Harris
63/503, ext. 3313

4662 RS-232 INTERCONNECT CABLE CHANGE

The RS-232 cable currently used with the 4662 plotter does not utilize pin 6, Data Set Ready (DSR). This cable, P/N 012-0690-01, will be replaced by P/N 012-0829-00, which is the same cable used with the 4663 (i.e., pin 6 installed).

The 4662 is designed so it can be installed between a terminal and its host. When the 4662's power is turned off, all RS-232 signals are passed straight through. The old cable, however, did not pass DSR which might cause the communication link to be broken. This is because certain host computers require DSR to establish and maintain RS-232 communication with the terminal.

--Larry North
63-503, ext. 3926

INTERFACE VERIFICATION MANUAL, GPIB, OEM

The new S-3200 Series Interface Verification Test Descriptions Manual 070-3550-00 is now orderable. The optional interface verification programs described in this manual check the interface packages for these instruments:

Wavetek 154 Synthesized Waveform Generator
Racal-Dana 8010B Electronic Counter
Hewlett-Packard 8660C Signal Generator
GPIB Controller Interface
Temptronix TP450 Interface

--Ron Lang
92-236, Ext. 1015

R1330/R1330-65IL: TEST STATION MULTIPLEXER IMPROVEMENT

REFERENCE: Mod M41857

Power supplies in the R1330 and R1330-65IL multiplexers often do not supply sufficient power to the various interfaces.

Modfication kit P/N 040-1026-00 includes a new wiring harness, diagrams, and instructions needed to enhance the current handling capacity of the +5 Volt power supply in the R1330.

A limited number (5) of these kits were assembled for Customer Service. Expected demand for this kit is low. The R1330 Station Multiplexers are presently used only in dual station systems. Initial orders for this kit should be placed only for customers whose R1330 has exhibited a power supply deficiency. Customers with a definite need will not be charged. See Parts Notice #73.

In the event that the demand for this kit is greater than the initial forecast, CMS will be prepared to respond to back orders in three months.

--Jim Stubbs
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2942: DRIVER BOARD HAS SELECTABLE RESISTORS

Schematic Page (diamond) 16 in the 2942 Manual (070-3193-00) shows the Timing and Mask Control on the Pattern Driver and Timer Board (670-3868-00). Note that R222 is a selectable width resistor for TØ (shiftclock) and R231 is a selectable width resistor for TØD.

The selectable range for both circuits is 3.24KΩ to 4.53KΩ. Increasing the resistance results in a wider pulse.

When a 2942 Pattern Generator is added to a system it is necessary to reskew the effected clocks. Run AØ3Ø.TST (Phase.EDT). Delay for TØ and TØD through the 2942 can be adjusted with variable resistors R842 and R942, respectively. The pulse widthes can be changed as needed by selecting the appropriate values of R222 and R231.

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4051 SERVICE MAINTENANCE INFORMATION

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4051

INTENT: Provide supplementary or additional maintenance information not available in the Service Implementation Plan or Service Manual. Reference should be made to the published Service Implementation Plan, dated August 21, 1981.

ORIGINATOR: Darrell McGiverin, Performance Assurance Engineer
63-503, ext. 3786 (WI)

The 4051 CPU board (670-4008-06), 4051 standard backpack (670-4325-01), and 4051 communications backpack (670-7069-00) have all undergone changes. These changes do not affect the speed at which the 4051 does any of its operation.

The changes to the CPU board is in the densities of the RAM and ROM. Instead of having 16 masked ROMs there will be only four. The existing tests in the System Test Fixture (067-0746-00) are compatible with the new CPU board. The Version 6 firmware on the new CPU board (670-7086-00) will have the same checksums as the Version 5 firmware on the old CPU board (670-4008-06). Table 1 shows the breakdown of each checksum as it pertains to each of the 4 ROMs.

(ARTICLE CONTINUED ON THE NEXT PAGE)

TABLE 1

Part Number	Circuit Number	Starting Address	Version 6 Checksums
160-0909-00	U581	8000	7D
160-0908-00	U481	8800	E0
160-0908-00	U481		5B
160-0908-00	U481		IC
160-0908-00	U481		8A
160-0909-00	U581		53
160-0909-00	U581		B2
160-0909-00	U581		4D
160-0907-00	U385	C000	BE
160-0907-00	U385		42
160-0907-00	U385		E2
160-0907-00	U385		F4
160-0906-00	U381	E000	E2
160-0906-00	U381		AD
160-0906-00	U381		CE
160-0906-00	U381		F4

The RAMs that are being used will be 156-0968-02, which are 16Kx1 bit RAMs instead of the 156-0635-00 4Kx1 bit RAM. There will be only two RAM memory configurations for the new CPU boards. The two versions are the standard version which will be 16K bytes and the second will be the 32K bytes (Option 22). For use of the System Test Fixture the address breaks are in Figure 1.

(ARTICLE CONTINUED ON THE NEXT PAGE)

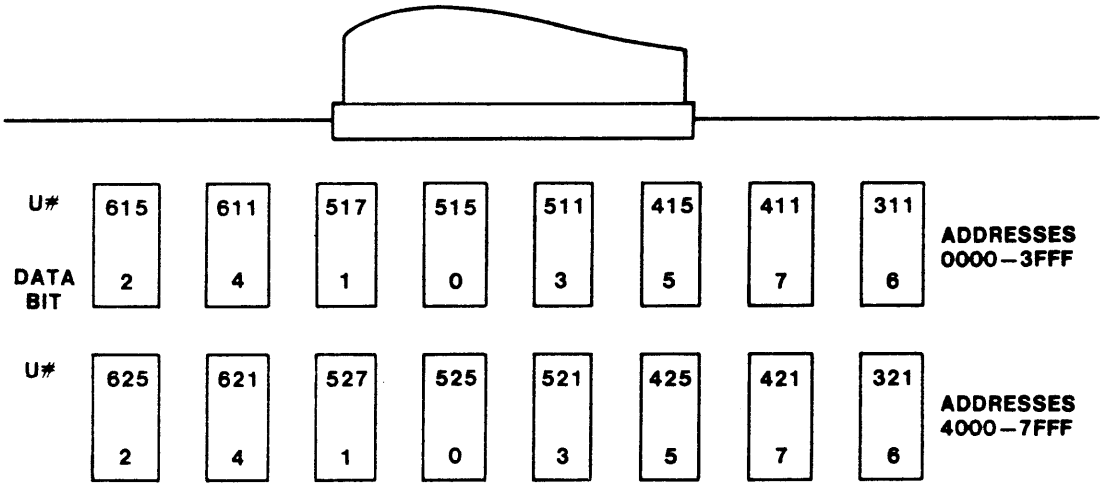

Figure 1.

There have been some enhancements incorporated into the standard and Option 1 backpack, along with a Relayout. The enhancements are the Binary Loader and Matrix ROMpack. They both are built into the backpacks and are standard with each of the backpacks.

The old standard and Option 1 backpacks are compatible with the new CPU board. But the new standard (670-7091-00) and Option 1 (670-7069-00) backpacks are not compatible with the old CPU board, unless the following modification is implemented to the 670-4008-06.

Modification #M43759 as follows:

Materials needed - three 156-0852-02 IC components (74LS367)

1. Remove U231, U251, and U261. The Tektronix part number for each of these three components are 156-0535-02 IC.

2. Replace U231, U251, and U261 each with a 156-0852-02 IC.

3. Roll 670-4008-06 board to a 670-4008-09 level board.

The new 070-2065-01 4051 Graphics System Service Manual, Volume I and the 070-2286-02 4051 Graphics System Service Manual, Volume 2 have the schematics and replaceable parts lists and are available. They also contain the proper information for use of the System Test Fixture with the new CPU board (670-7086-00).

--Darrell McGiverin
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