## Tektronix



## Wizards Workshop

ALL SERUICE QUESTIONS FROM EUROPE, MIDDLE EAST, AND AFRICA SHOULD BE ADDRESSED TO THE EUROPEAN marketing center service group in the netherlands.

## TEKTRONIX INTERNAL USE ONLY

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John Toftemark, RSOM - Rockville, has announced that S.K. SHERMAN has accepted the job of Logistic Coordinator in Rockville effective AP101.
S.K. has an extensive background in logistics support with the Air Force. He also has a Bachelor of Science in Occupational Education from Wayland Baptist College with a double major in Electronics and Digital Equipment Technology. He is presently enrolled in post-graduate studies majoring in Communications. The past two years, S.K. has been a Field Service Specialist in Rockville playing a major role in developing board inventory procedures and a local dispatch system.

Please join us in congratulating S.K. in his new endeavor and wishing him the best of luck.

John Toftemark has also announced the promotion of JERRY CARMICHAEL to the position of RSSM in Rockville effective AP101.

Jerry's background with Tek as Manufacturing Manager, T\&M Technician, Field Service Specialist and as Field Service Supervisor in Atlanta for the past four years brings a lot of experience to the new job.

Jerry graduated from Middle Tennessee State University with a BS degree in Industrial Technology.

Congratulations to Jerry and we all wish him the best of luck.

Both S.K. and Jerry will report to John Toftemark in Rockville.
******
John Firriolo, ASM - Woodbridge, has announced the promotion of SAL LEONE to the position of Field Service Supervisor in the Woodbridge Field Office effective May 5, 1980.

Sal's past experience with Perkin Elmer and Datapoint as District Manager will be a valuable asset to the total team objectives.

Congratulations to Sal and the best of luck here at Tek.
--Sharon Huetson Editor
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## P/N 151-0190-00 Defective Stock

Component Quality Control has found parts, under P/N 151-0190-00, which have incorrect markings. All devices under P/N 151-0190-00 should be marked 2N3904, defective parts are marked 2N2904. Please check all stock areas under P/N 151-0190-00 and purge any device which is marked 2N2904, reorder as necessary.
--Rich Andrusco
94-816, Ext. 1582
$\qquad$
$\qquad$

## ADMINISTRATIVE SUPPORT

## COMPONENT FAILURE REPORTING

Reporting of failed discrete components on the "new" service record is accomplished in the same manner as was done on the "old" service record. More than one discrete component, having the same Tektronix Part Number, may be reported on a line.

Board exchanges, on the other hand, should be listed on separate line entries. This is necessary to isolate circuitry in products using the same Tektronix Part Numbered Board in more than one location.
--Bill Duerden
53-027, Ext. 8938 Merlo

## NON-PART RELATED FAILURE CODES

Non-part related failure codes are to be entered on the new service records in the same manner as component failure codes. Indicate the related product in block 41 "LINE ITEM" and enter the appropriate non-part related failure code in block 43 "FAILURE CODE".

If the failure can be identified as workmanship related use a 9 in the first digit position, otherwise, use a 1.

--Bill Duerden
53-027, Ext. 8938 Merlo

## $\checkmark$

## DM501A: 500V AC RANGE 1\% LOW

TM500 Manufacturing has found that a majority of instruments shipped prior to January 1st, 1980 may have the incorrect capacitor installed for Al4 C1124. The correct part is silver in color and is hermetically sealed. The incorrect part is a yellow capacitor which will cause AC Hook if used in a humid environment. The AC Hook will cause up to a $1 \%$ low error on the 500 Volt AC Range.

All instruments passing through a service center should be checked for the correct capacitor. Verify that the yellow body capacitor is not installed and that your stock, under P/N 285-1197-00, does not contain any yellow body capacitors.

> HOOK

## Definition

The effect on a signal caused by an apparent change of capacitance with frequency. This capacitance is inversely proportional to frequency.

## Effects of Hook on a DMM

As the input frequency increases the DMM attenuator circuit becomes less resistive and more capacitive. At the same time the hook is decreasing. At some frequency, generally 400 Hz , the hook has its greatest effect and the result is a peak in the DMM readout.

## DM501A Specifics

The most critical part of the DM501A is the upper half of the capacitive voltage divider: on the 20 V range C1110 and trimmer C1114: on the 200 V range C1120 and trimmer C1128; on the 500V range C1126 and trimmer C1129. The value of the fixed capacitor has been selected so that when the range is calibrated the trimmer should be near the low end of its value. This is done because these trimmers generally have more hook than the fixed caps that we use and are less stable in humid conditions. Tektronix is actively pursuing higher quality capacitors and devising methods of specifying our requirements concerning hook to our vendors.
--Rich Andrusco
94-816, Ext. 1582

## RTM/TM506 APPLICATION PRECAUTIONS

Manufacturing has discovered that the labeling for the Rear Interface Board Connectors was inadvertently reversed when a change was made to the board. This error will only create problems when wiring the connectors for special applications.

When viewing the rear of the Interface board the connectors should be marked with a "B" on the Left Side of each connector and an "A" on the Right Side (See Fig. 1). The incorrect markings have "A" and "B" reversed (Fig. 2). All RTM/TM506's, including Option 2 units, between Serial Numbers B030600 and B032550 should be checked. If markings are incorrect then they should be hand corrected using a water proof felt tip pen. Either cover incorrect marking or attempt to remove or destroy them.


Fig. 1
Fig. 2

TM500 Marketing is sending out a letter to all customers to alert them to this mis-labeling. They will include serial numbers affected and stick on labels.
--Rich Andrusco
94-816, Ext. 1582

SC504: INTERMITTENT $+5 \mathrm{~V} /-5 \mathrm{~V}$ SUPPLIERS
REFERENCE: 070-2296-00, SC504 Manual
Both the +5 V and -5 V supplies use the mainframe NPN and PNP Series Pass transistors for regulation. The connections to these pass transistors are made through a small interface board assembly (A6) in the SC504. (Fig. 1 Exploded View, item \#71).

The interface assembly (A6) has square machine inserted pins which are soldered to the board. Manufacturing has informed me that some units may have been shipped with these pins not being soldered. This will cause intermittent power supply regulation which will get worse as oxidation builds up between pin and board contact areas.

All SC504's should be checked when coming into a service center. If pins are found to be unsoldered then repair by soldering.
--Rich Andrusco
94-816, Ext. 1582

A new Rear Interface Access Extender board (Fig. 1), Part Number 067-0965-00, has been developed to provide easier access to rear interface Input and Output signals on plug-ins. It was developed to be used as a service tool for troubleshooting by Qualified Service Personnel. When used it should be inserted between the plug-in under test and the Standard TM500 Flexible Extender, Part Number 067-0645-02. "CAUTION"! Remove power before installing.

## Part No. 067-0965-00



Fig. 1
--Rich Andrusco
94-816, Ext. 1582

## 7B53A, "B" SWEEP INOPERATIVE S/N B210000 \& UP

Reference: 7B53A Service Manual P/N 070-1342-00 Mod \#M33809
It has been found that when modification M33809 was initiated, that the circuit board run between R462 and the -15 volt power supply had been omitted. The problem only shows up when the 7B53A is installed in a three wide mainframe, and will work properly in a four wide mainframe. Manufacturing became aware of the missing connection and repaired the defective boards with a wire strap, until the filmwork could be reworked. Unfortunately not all bad boards were caught and repaired in manufacturing. The board filmwork number, located on the rear of the trigger board, will help to identify a board that has the new filmwork or not. Boards with the prefix "KD" have the new filmwork. Some boards with the prefix "KC" could be missing the strap and should have it installed. Refer to the following board layout for strap location.

--John Eaton
58/511, Ext. 6902

Reference: WIZARD'S WORKSHOP ISSUE 10-8
Manufacturing Engineering Component Support has discovered that "Capco Brand" capacitors, P/N 285-0938-00, with Date Codes 7935 through 7951 inclusive have not had oil impregnation. This cap is used in most of the 7000 Series highefficiency power supplies. Its circuit in the 7704A is C3037, and C37 in the 7854, and in all the other above listed instruments it is C1237. This capacitor is part of the series-resonant network that provides damped oscillations to start the inverter switching action. With this capacitor defective, this will cause the inverter not to start, or fail later.

Please replace all "Capco Brand" capacitors with the noted date codes.
--John Eaton
58/511, Ext. 6902

## 7313/R, 7613/R, 7623A/R, 7633/R EMI MODIFICATION KIT

With the above instruments now coming out with detachable power cords, it is necessary to supply new 040 kits for the E.M.I. Modification. The older kits, P/N 040-0663-01, for the bench model and P/N 040-0678-01 for the rackmount, will not work on instruments with detachable power cords. For these instruments, P/N 040-0954-00 should be used on bench models and P/N 040-0955-00 for the rackmount version. These new 040 kits do not supersede the older kits, so continue to use the older kits for instruments with permanently mounted power cords.

> --John Eaton
> 58/511, Ext. 6902

## 7603/R EMI MODIFICATION KIT

A new EMI kit has been set-up for instruments equipped with a detachable power cord. The older kits, P/N 040-0662-01 for the bench model and P/N 040-0679-01 for the rackmount, will not work on instruments with detachable power cords. For these instruments, P/N 040-0954-00 should be used on bench models and P/N 040-0955-00 for the rackmount version. These new 040 kits do not supersede the older kits, so continue to use the older kits for instruments with permanently mounted power cords.
--John Eaton
58/511, Ext. 6902

## 7854, ROM BOARD JUMPER LOCATION

A significant hardware problem exists with the initial twenty-five 7854 demos which are in the field at this time. The corrective action is extremely simple, however. It involves removing the R.O.M. circuit board assembly, board \#A31, P/N 670-5847-00 and changing the position of a harmonica jumper. The problem exhibits itself as random computational errors, acquisition errors, or just a complete loss of the processors "sanity". The first twenty-five demos are the only ones which need to be corrected. Following is a procedure and diagram to correct the problem.

Procedure:
A. Remove the right hand side panel of the 7854 , exposing the digital boards behind the measurement keyboard.
B. Remove the aluminum bracket which covers the boards.
C. Remove the GPIB board (A30) and the ROM board (A31) by lifting up on the two plastic "ears" of each board. Leave the ribbon cable attached to the GPIB board.
D. Locate the jumper on the ROM board as shown in the drawing. Remove the harmonica jumper and re-install to the "CL" position as indicated in the drawing.
E. Replace the ROM board, the GPIB board, the aluminum cover, and the side panel.

Note: This procedure requires no calibration or soldering. This need not be performed in a service center.
( continued on the following page)

--John Eaton
58/511, Ext. 6902

TELEVISION PRODUCTS

## 147A/149A, CORRECTION TO EXTERNAL VITS GAIN ADJUSTMENT PROCEDURE

Reference: 147A/149A Manual P/N 070-2029-00, Page 3-32

Step 2 of Group 13 (VITS INSERTION) does not work as set up in the manual. To accomplish this step, a modified P9014 must be used. By adding a switch and changing the internal wiring slightly, P9014 can be used as both a standard operating plug and as the test plug required to do Step 2 (see drawing). Use the following procedure when checking/adjusting External VITS Gain:

Connect the video signal source (140) Comp Video to the BLACK BURST input, and connect the loop-through to the EXT. VITS IN connector. With the switch on P9014 set to connect Pin 9 to Pin 12 (Pin 12 no longer connected to Pins 21 and 24), ground the external ground clip. Set the 140 to provide a 100 IRE Pedestal on a convenient line and field (e.g. Line 17, Field 1); program the $147 \mathrm{~A} / 149 \mathrm{~A}$ for the External VITS (see the operating changes portion of Section 1 for programming External VITS). Display the vertical interval of the PROGRAM LINE OUT signal on the monitor.

The rest of the procedure in the manual is correct. See the following drawing for changes to P9014 (P/N 131-0324-00). After completing this step, set switch on P9014 so that Pin 12 is connected to Pins 21 and 24 and remove External ground clip connection.
(continued on the following page)


SWITCH (260-0613-00, 260-1206-00, OR SIMILAR)
--Steve Schmelzer
58/511, Ext. 6507

ACCESSORIES

## 1101 POWER SUPPLY RIPPLE

Reference: 1101 Manual P/N 070-0949-00
Probe Power supply Schematic
Implemented by Manufacturing at S/N 8041880
To ensure power supply ripple is within tolerance, components Q53 and Q83 located on the power supply circuit board were changed from P/N 151-0232-00 to $P / N$ 151-0232-03. See schematic for location of changes.


PROBE POWER SUPPLY

> --Dave McKinney
> 58/511, Ext. 7072

## T900 INTERMITTENT ATTENUATORS

Reference: WIZARD Articles: December 21, 1979 - Issue 9-25
January 11, 1980 - Issue 10-1

Parts and labor for replacing the defective retainer bars, P/N 343-0564-00 (Ch 1) and P/N 343-0565-00 (Ch 2), will be charged to Code 18. For International, see last paragraph.

|  | Produced in U.S. |  |
| :--- | ---: | :--- |
| T912 | S/N B014128 to | B015326 |
| T921 | B012418 to | B013082 |
| T922 | B021948 to | B027175 |
| T922R | B011673 | to $B 012885$ |
| T932A | B020617 to | B021589 |
| T935A | B020959 to | B022584 |
| 442 | B011235 to B022335 |  |


| Produced in Guernsey |  |  |
| :--- | ---: | :---: |
| T912 | S/N 103654 to 105534 |  |
| T921 | 100434 to 100514 |  |
| T922 | 103629 to 104879 |  |
| T922R | 100191 to 100401 |  |
| T932A | 101321 to 101961 |  |
| T935A | 102541 to 103471 |  |
| 442 | Not produced in Guernsey. |  |

The starting numbers for these instruments are approximate starts.

T900 scopes between the above serial numbers sent into the service centers must be inspected for defective retainer bars. All other T000 scopes should be inspected. If the instrument falls between the serial number break, the bar must be replaced. There is no easy way to determine if the bar is the correct size; however, if the instrument has intermittent attenuators or a history of intermittent attenuators, it is a good sign that the bar is defective and should be replaced (regardless of serial number).

Once the attenuator shield is removed, a defective bar can be detected by the free play of the drum on the bearing surface of the bar. Pushing on the drum will cause it to move up and down. On a good retainer bar, there will be almost no free play. The last method to determine if the bar is defective is by using calibers to measure the diameter of the bearing from top to bottom. This measurement should be . 330 " + .000" - . $002^{\prime \prime}$; if not within tolerance, replace the bar.

All work on replacement of the retainer bar will be done Code 18 for one year. After this period, the customer will be charged for the work. All instruments
(continued on the following page)
under warranty will also be Code 18. If any other warranty work is done, make out one Service Record for the 02 work and one Service Record for the 18 work.

After the retainer bars have been replaced, place a white tag on top of the attenuator shield to indicate that it has been repaired.

## International Service Centers

If the instrument is under warranty, it should be covered under code 02 . If the instrument is not under warranty, the discretion of the Service Manager is needed to determine whether the customer should pay or not.
--Mike Laurens
58-511, X7012

Reference: 475 Manual P/N 070-1862-00
475A Manual P/N 070-2162-00
Schematic 〈9 Timing \& Horizontal Display Switching S1050
Serial Numbers: 475 B250000 to B278982
475A B018403 and Below
475, 475A with DM40, 43 or 44: All Serial Numbers
To improve reliability, the lockout assembly has been removed from the timing switch. The old part number 263-1091-01 has been deleted and will not be supported. The new part number 263-1091-03 is a direct replacement for the old part and does not include the lockout assembly. The - 03 part includes part number 263-1091-02 and a data sheet which reads:

Cam Switch Assembly 263-1091-02

475 Serial number: B250000 to B278982
475A Serial number: B010100 to B018403
The mechanical lockout of this new cam assembly has been eliminated, but is a direct replacement for those $S / N$ listed above. It is possible with the new cam assembly to mechanically select a timing rate which is an illegal mode.
"A" Time/Div (clear plastic outer flange) can now be set to . 02 us and the "B" Time/Div switch (inner dark knob) can be unlocked (this was prevented with the lockout assembly) and set to .01 us. This is an illegal mode and the timing will not be correct. However, to prevent and illegal mode from happening there is a gray shaded area on the front panel with the words "A only when knobs locked." There are words on on the "B" Timing knob "lock knobs for A", and there are words on the "A" Horizontal Display button "A lock knobs". These instructions should be followed for correct instrument operation.

For serial numbers greater than those listed above, 263-1091-02 is used as the original cam assembly.
(continued on the following page)

Below is a diagram of the new switch assembly and the part numbers to support the switch.

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SECTIONC-C


SHAFT ASSEMBLT DETAIL


|  |  |  |  | 11 | 384-0882-06 | 1 | SHAFT |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 21 | 210-0949-00 | 1 | WASMER | 70 | 354-0390-00 | $!$ | RETAINER |
| 20 | 361-1033-00 | 1 | SPACER, SLEEVE | 9 | 384-0878-00 | 1 | SHAFT, OUTER CONC |
| 19 | 354-0392-00 | 2 | RING,RETAINING | 8 | 214-1139-02 | 2 | SPRING (.008 7KK) |
| 18. | 210-1160-00 | 1 | WASHER, PLAIN | 7 | 214-1139-03 | 2 | SPRING (.ON THK) |
| 17 | 20-0004-00 | 8 | LOCK WASHER (NO 4) | 6 | 214-1752-00 | 4 | ROLLER |
| 16 | 200-1724-00 | 1 | COVER | 5 | 131-0963-00 | 2 | CONTACT, ELEC |
| 15 | 105-0623-01 | 1 | ACTUATOR ( FRONT) | 4 | 20-0406-00 | 14 | NTT (4-40) |
| M | 214-1416-00 | 1 | SPRNG | 3 | 407-1199-00 | 1 | SUPPORT |
| 13 | 211-0008-00 | 8 | SCREW (4-40 A.250) | 2 | 401-0178-01 | 1 | REARING |
| 0 | 105-0624-01 | 1 | ACTUATOR (REAR) | 4 | 401-0180-00 | 2 | BEARING |
| 17511 | PART M? | GIY | DESCRIDTION | П15 | PART NO | GY | DESCRIPTION |
| LIST OF MATERIALS |  |  |  |  |  |  |  |

475 Serial Numbers B010100 to B249999 will still use P/N 105-0363-00 for replacement of the horizontal timing switch.
--Mike Laurens
58/511, Ext. 7012
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QUESTIONS \& ANSWERS

## QUESTIONS \& ANSWERS

\#1

## PRODUCT

4006 Q. The wait LED is missing from the keyboard, is this normal?
A. The wait LED is on the keyboard only when the Option 1 interface is installed. On a basic 4006-1 the hole has a plug in it.
Q. Does the 4006 have any means of stopping the display at page full?
A. No. The host has to be programmed for this type of control.

401X Q. Is Option 20 compatible with CM 018-0094-01? Printer Interface?
A. No! It is so indicated in C.M. catalog.
Q. When returning a circuit board to Board Exchange (i.e. Option 40 w/Option 41) what firmware/memory should be included?
A. Those firmware/memory chips which are standard to the board only should be included. As in this example Option 41 should be removed.
Q. Customer ordered an 012-0717-00 cable and says it won't fit his Option 1. There are too many pins in the harmonica connector.
A. The customer has an 021-0074-00 interface. This cable is for 021-0074-01. He needs P/N 012-0373-00.
Q. What does the "REP" command do (Option 5, 40, 41)?
A. Gives the user a list of GPIB peripherals which are "SET".
Q. How can you transmit a "REP" to the host?
A. Same as a "STATUS". It is sent to the device that issued it.
Q. What is the TTY custom mod for Auto Trol?
A. CM 018-0111-01.
Q. Does the $4014 / 15$ CRT rotation kit 050-0740-12 include a CRT?
A. Yes!
Q. What is the remote viewing kit on the 4016 for?
A. To desk mount the display.
Q. Can a TTY interface be run with external clock?
A. No!

463X Q. What is the difference between the 067-0690-00 and 067-0690-01?
A. The 00 version is sent from the Factory calibrated to $1029 / 60 \mathrm{HZ}$, $w / 10$ step grey scale. The 01 is sent calibrated to 525 line 60 HZ , w/16 step grey scale. Multiburst is also at different frequencies.
Q. How long does it take to convert a 4632 to 1029 line 60 HZ ?
: A. The average time is approximately 10 minutes by a technician familiar with procedure.

466X Q. We have a 4663 with "DEMO, not to be sold" tag on it. Can it be upgraded for sale?
A. No! It should be returned to Wilsonville when replaced with production product.
Q. Is a fixture required to change the platen on a 4663?
A. No, procedure is in Service Manual.
Q. If a platen becomes inadvertantly gouged must it be replaced?
A. Yes. The gouges can be filled with super glue P/N 006-2366-00, then carefully sanded flush. This will temporarily repair the platen surface until the new one arrives.
Q. What is the part number for aluminum, paper roll tube holders for 4663?
A. 401-0467-00 and 401-0399-00.
Q. Why doesn't the 4662 work reliably with a 4052 ?
A. The 4052 requires level 3.2 firmware to work with the 4662.
Q. Why doesn't the 4662 do dot-dash vectors?
A. This is not a feature of the 4662 firmware.

4907 Q. Is version 2.0 firmware available for the 4907? Page 5.2 of 4014 Option 5 manual says it is required for compatibility.
A. $\quad 1.2$ is the latest firmware for 4907 . A change will be made to the Option 5 manual.

492X Q. What is the $P / N$ for the 4924 V4.0 update kit?
A. 050-0860-02

Displays Q. Does 611 Mod AA or JA disable write thru? Can't get write-thru to work on any of the instruments.
A. Short pins 22 ard 24 of 3340 together to place unit in write thru. See page 11 of manual 061-1085-00.

General Q. Is installation of product included in rental price?
A. If the product has free installation if purchased (i.e. 4014, 4051) then installation is included in rental price. If product does not have free installation if purchased (i.e. 4631, 4632) then installation is billable when rented. Exceptions: Some major rental agreements can be negotiated to include installation. It may be prudent to discuss terms and conditions with appropriate sales engineer.
(continued on the following page)
Q. What is the part number for the special OP-Amp used to modify the character generator of 4014 when installing an interactive buffer custom mod?
A. This OP-Amp is no longer required to install mod. It should be replaced by the standard part. The character generator reverts to current production status. (Manual Change Notice C-912-1 to 061-1371-00)

402X

405X Q. What is the part number for sockets on 4052/54 ALU Board?
A. 136-0751-00. See Wizard Workshop 9-16.
Q. Why doesn't the 4924 work with 4052 ?
A. 4052 must have level 3.1 firmware and 4924 must have level 4 firmware.
Q. How long can a cable be when used with line drivers? CM 119-0782-XX. A. 2000' with Tek line driver cable.
Q. How do you request a modified product for a customer?
A. Requests for modified products must come through marketing. Refer the customer to the appropriate sales person, who can follow up with a request for quote from Modified Products Marketing. (see Modified Products Catalog and FRM for details).

Dick Schilling
63-503, ext. 3931

## 401 X OPTION 4 TTY PORT INTERFACE INSTALLATION

When installing a 401 X Option 4 TTY Port Interface for Data General Computers, there may be a discrepancy between the color code of the wire harness and the color codes called out for the wire harness in the manual.

Refer to 021-0072-00 TTY Port Interface Manual P/N 070-1356-00 pages 1-6, 1-7, and 1-8.

The actual wire harness being shipped now is configured as follows:
HARNESS WIRE LIST

| CANNON | SIGMAL NAME | WIRE COLOR | NOVA DESTIMATION |
| :---: | :---: | :--- | :---: |
| 1 | +5 | BLU | A87 |
| 2 | READER | GRN | A89 |
| 3 | T DATA | WHITE | B69 |
| 4 | -5V | BRN | A6 |
| 5 | INTERFACE CLOCK | GRY | B19 |
| 6 | R DATA | ORN | A85 |
| 7 | PULLUP | RED | A83 |
| 2 | 2 STOP BITS | YEL | A87 |
| 9 | GROUND | VIO | A89 |



With older installations the color coding of the wires may be different than what is currently being shipped. If in doubt the cable can easily be checked with an ohmmeter.

## 4016-1 RELIABILITY UPGRADE ON LOW VOLTAGE POWER SUPPLY AND STORAGE

 BOARD ASSEMBLYThere have been two (2) 040 kits set up to update the 4016-1.
040-0934-00
This kit contains the parts necessary to improve the operation of the low voltage power supply.

Switching transistors Q1022 and Q1023 have proven to be prone to failure. To increase reliability, several parts have been added to decrease power dissipation, diminish inductive voltage spikes, and dampen ringing.

040-0936-00
The kit contains parts necessary to accommodate variations in transistor characteristics and eliminate the need to hand select transistors for the storage board assembly.

The 151-0423-00 transistor (Q116, Q125, Q131, Q142, Q151, Q155, Q161, Q166, Q171, and Q181) was found to have slight differences in characteristics depending on the vendor. This difference causes one vendor's part to be susceptible to inductive transients which leads to possible failure.

These kits are available through normal order processing channels.
Customers should be billed for this update. This is not a Service Update Program and should not be charged to Activity Code 18.

4054 F30 SHIPMENTS
-- Kent Barnard 63-503
Ext. 3598 (Wilsonville)
Manufacturing has been shipping 4054 F30 (Field Installed Dynamic Graphics Option) with a set of L4.1 firmware. This was done to insure that L4.1 would be available to update the customer's 4054 when the F30 arrived. The firmware kit was not a standard part of the 4054 F30 package. Several 4054 's have been shipped with firmware level 4.1 installed.

Therefore, sending out the 4054 F30 with the firmware may be unnecessary since it could go into a 4054 that already has L4.1.

Effective April 7, Manufacturing has stopped sending out 4054 F30 with the firmware update kit.

The service centers should order the update kit 050-1282-01 containing L4.1 firmware and have it available before installing a 4054 F30 into a customer's unit that has firmware level 3.2.
-- Del Moore
$63-503$
Ext. 3930 (Wilsonville)

The hardcopiers' power transformer jumpering for various line voltages is described on pages 4 to 6 of the April 15, 1977 issue of the Wizards Workshop (issue 7-08) as well as many service manuals issued since then. Please note that the double jumpering listed under the 220 volt column is not desirable.

By connecting terminals 5 to 7 and 6 to 8 , two primary windings are connected in parallel. This is readily seen from the schematics in the hardcopy manuals. Normally, no adverse effects will be encountered. If, however, the two windings are imbalanced, early power transformer failure may result.

It is better to install only one of the straps ( 5 to 7 has been chosen for consistency). There is no intent to rejumper existing 220 volt products in the field. This article is for your information only.


The part numbers of manuals affected are 070-1831-XX (4631), 070-1686-XX (4632), 070-2547-XX (4633A) and 070-2562-XX (4634).

## 4633A MOD JE: MAINBOARD BLANKING CHANGE

To satisfy new customer requirements, the dc restorer circuitry around pin 4 of U265 on the mainboard is being changed.


In the figure above, U265B is a threshold detector. The 5.58 volt threshold is determined by R251 and R252. On pin 4, a dc restorer consisting of R256, R257, CR253 and CR255 seeks to maintain a leve1 of +5.0 volts. This is coupled to the x-axis deflection signal via C264. Since the $X$-axis deflection amplitude is typically .8 volts, the signal present at pin 4 is a .8 volt ramp on a +5.0 volt dc level (see figure 2a). The output is a series of negative going pulses with the same repetition rate as the $x$-axis ramps. These pulses are shaped and processed by further protective blanking circuitry.


Figure 2a


Figure 2b

Immediately after retrace, charge is "dumped" into C264. The rate of charging is determined by R256, and to a lesser degree R254. This charging rate is fine for waveforms such as that of figure 2a. However, the waveform of figure 2 b allows C 264 much less time to charge before the occurrence of the next scan line. Pin 4 drops below the +5.0 volt restored level and the ramp fails to cross the 5.58 volt threshold. The result is a loss of the pulsed output from U265B. The protective blanking circuitry that follows assumes that no x-axis ramp is being produced and z-axis blanking results.

To correct this, the values of R254 and R256 are changed as follows:

| Circuit Number | 01d Value | New Value | New Part Number |
| :---: | :---: | :---: | :---: |
| R254 | 1 K | $47 \Omega$ | 315-0470-00 |
| R256 | 10K | $3.9 \mathrm{~K} \Omega$ | 315-0392-00 |

This change causes the part number of the mainboard to roll from CM 670-6394-01 to CM 670-6394-02. A11 4633A mod JE instruments shipped to date are being fitted with this change at the customer site by manufacturing. All instruments currently being shipped have the change installed. This article is for your information only.

For information on ordering custom modified parts, please refer to parts notice \#176.
--George Kusiowski
$63 / 503$, ext. 3928

4663 DIAGNOSTIC TEST FIXTURE MANUAL AVAILABLE
It is recommended that any previous printings of the Diagnostic Test Fixture Manuals, 061-2095-00, be discarded and replaced by the new manual, 070-2842-00.

This new manual contains changes and additions, that in some cases are necessary for proper operation of the 4663 Diagnostic Test Fixture.
--Larry North
63/503, ext. 3926

## LABORATORY INSTRUMENT DIVISION

LDP (MDL) SYSTEMS

## PROBLEM INSTALLING V3.0 EDITOR

A problem was found installing the Version 3.0 Editor on a 9900 TEKDOS disc. The problem originates in the command file "INSTALL" found on the non-system disc shipped with the software. 9900 TEKDOS requires that fills and patches be specified on even word boundaries, and modify whole word locations. The following changes should be made to the command file INSTALL:
 PATCH 3956 СФСФСФ PATCH 39BB СФСФСП
should be should be should be

FILL $\emptyset \emptyset \emptyset \emptyset$ 3FFF $\emptyset \emptyset \emptyset \emptyset$
PATCH 3956 CФCØCØD2
РАТСН 39BA 39СФСఏСФ

With the above changes the Version 3.0 Editor can be installed on any V3.1 TEKDOS including 9900.

## FET CHECKING ON DRIVER/A

When repairing the Drivers in the $S-3455$ it is sometimes hard to determine which FET is bad. This problem is compounded when you unknowingly replace a FET with a bad FET. There is a quick and simple way of checking the FET on the Driver without the use of a curve tracer or any other expensive equipment.

By using Q151 on driver 1 of the card, or the equivalent on the other drivers (example: Q251 on driver 2), you can check any FET used in the driver. The only requirement is that you need at least one good driver. Using this known good driver insert all unknown FET's into the Q151 slot. If there is any undesireable change in the driver you should not use this FET on any driver.

I have found that regardless of the condition of a FET, it will not damage the driver that you're using in this manner.
--Joe Lipska
Ext. 1634, 94-816

## S3260 SECTOR BOARDS

Effective June 1, 1980: The Module Repair Center will exchange a board sent in to be repaired with a board from the Exchange Center inventory.

All boards in the Exchange Center inventory have been updated to the latest level, and tagged with a label indicating the part number of the board assembly.

Each sector board that is received for repair will be inspected by the S 3260 technician and he will determine if the board is exchangeable, or whether it will have to be repaired and returned. (A few systems in the field do not have the latest mods and will therefore not accept the latest level sector boards.)

The Module Repair Center will benefit from this program because repair and modification can be more effectively scheduled. (Scheduling will not be dependant upon the fluctuating number of boards from the field.)

The field offices and customers will benefit from this program in terms of decreased turnaround time. Also each board exchanged from the Module Repair Center will be the latest update level.

Service Support has made the decision to replace all of the old type sample and hold boards ( $670-2626-X X$ ) on sector boards which are received by the Module Repair Center.
(continued on the following page)

This sample and hold board will be replaced with either the 670-4303-05 or the 670-4642-05 board, which ever is applicable.

The following list shows the sector board assemblies which will be stocked in the Exchange Center inventory.

| ASSY Name |  | S \& H Board |  |
| :--- | :--- | :--- | :--- |
| D1B |  | ASSY Number |  |
| D1B P |  | $670-4303-05$ |  |
| D1B R |  |  | $672-0717-00$ |
| D1B E |  | 0720 |  |
| D1B E/P |  | 0059 |  |
| D1B E/R |  | 0718 |  |
| D1B E/Y |  | $670-4642-05$ |  |
| D1B E/Y/P |  | 0719 |  |
| D1B E/Y/R |  |  | $0619-01$ |
|  |  | $0722-00$ |  |
|  |  |  |  |

Note: On all of the early 4303 and 4642 sample and hold boards, remote circuitry was included. (DL475, DL575, DL675.) This circuitry is only enabled if the remote option is installed in a system. If the remote option is not installed the circuitry will have no effect.

S3200: THUMBSCREW 1803, 1804, 1805
214-1878-00 1803, 1804 TEST STATIONS
214-1878-01 NOT USED
214-1878-02 1805 TEST STATION

1. 1803 Test Station, Manual 070-3133-01

Figure 2, Chassis, Ref. No. 21
Replaceable Mechanical Parts, Page 3-7
Change from:
Item 2-21 211-0119-00 OTY 2 Screw, Machine
Change to:
Item 2-21 214-1878-00 QTY 4 Thumbscrew: 4-40 X 0.48, 0.50 D , SST
Note: The 211-0119-00, 2 ea, machine screws are the screws near the DUT socket not called out in Figure 2.
2. 1804 Test Station, Manual 070-3331-00

Figure 2 Chassis, Ref. Nos. 3 and 6
Replaceable mechanical parts, Page 6-80
Change from:
Item 2-3 211-0119-00 QTY 2 Screw, Machine: $4-40 \times 0.25^{\prime \prime}$
Change to:
Item 2-3 214-1878-00 QTY 4 Thumbscrew: 4-40 x 0.48, 0.50D, SST
Change from:
Item 2-6 214-1878-02 QTY 1 Thumbscrew: 4-40 $\times 1.14,0.50 \mathrm{D}$, SST
Change to:
Item 2-6 211-0119-00 QTY 2 Screw, Machine: $4-40 \times 0.25^{\prime \prime}$, 100DEG FLH, STL
3. 1805 Test Station, Manual 070-3338-00

Figure 2 Chassis, Ref. Nos. 3 and 5
Replaceable mechanical parts, Page 6-80
Change from:
Item 2-3 QTY 2 214-1878-02
Change to:
Item 2-3 QTY 4 214-1878-02
Change from:
Item 2-5 QTY 1 211-0119-00
Change to:
Item 2-5 QTY 2 211-0119-00
See following figures.
--Ron Lang
94-816, Ext. 1015
(continued on the following page)



214-1878-01

$$
\frac{214-1878-02}{1805}
$$



## S3200: 070-3477-00, 1330 MANUAL CHANGES

I. Page 2-1: Test Oscilloscope

Change From: Tektronix Type 485 recommended
To: Tektronix Type 465 recommended
II. Pages 4-9, 4-10: Parts list changes for A6, 670-1777-00

Q1, Q2, Q3, Q4, Q22, Q24, Q26, Q28, Q30, Q32, Q34, Q36, Q37, Q38, Q39, Q40

Change From:
QXX 151-0224-00 Transistor: Silicon, NPN 80009, 151-0224-00
To:
QXX 151-0188-00 Transistor: Silicon, PNP 80009, 151-0188-00
III. Pages 4-9, 4-10: Parts List Changes for A6, 670-1777-00 Q21, Q23, Q25, Q27, Q29, Q31, Q33, Q35

Change From: QXX 151-0188-00 Transistor: Silicon, PNP 80009 151-0188-00 To: QXX 151-0224-00 Transistor: Silicon, NPN 80009 151-0224-00
IV. MOD 651L Interconnect (Schematic 9):

Change

| From: | To: |  |  |
| :---: | :---: | :---: | :---: |
| VS7 STA 1 S+ | VS7 STA 1 V - | J11-C | J322-1, |
| VS7 STA 1 V - | VS7 STA 1 S+ | -E | J322-1, P |
| VS6 STA 1 S+ | VS6 STA 1 V - | -H | J322-1, F |
| VS6 STA 1 V - | VS6 STA 1 S+ | -N | J322-1, J |
| VS7 IN V- | VS7 IN S+ | -S | J322-P |
| VS7 IN St | VS7 IN V- | -U | J322-L |
| VS8 IN S+ | VS8 IN V- | -X | J322-S |
| VS8 IN V- | VS8 IN S+ | -Z | J322-V |
| VS6 STA 2 S+ | VS6 STA 2 V - | -C | J322-2,F |
| VS6 STA 2 V - | VS6 STA 2 S+ | - $\bar{F}$ | J322-2, J |
| VS7 STA 2 V - | VS7 STA 2 S+ | -M | J322-2, P |
| VS7 STA 2 S+ | VS7 STA 2 V - | -P | J322-2, |
| VS8 STA 1 S+ | VS8 STA 1 V - | J11-3 | J322-1, S |
| VS8 STA 1 V - | VS8 STA 1 S+ | -5 | J322-1, V |
| VS5 STA 1 V - | VS5 STA 1 S+ | -11 | J322-1, |
| VS5 STA 1 S+ | VS5 STA 1 V - | -13 | J322-1, $A$ |
| VS5 IN S+ | VS5 IN V- | -14 | J322-A |
| VS5 IN V- | VS5 IN S+ | -16 | J322-D |
| VS6 IN V- | VS6 IN S+ | -21 | J322-J |
| VS6 IN S+ | VS6 IN V- | -23 | J322-F |
| VS5 STA 2 S+ | VS5 STA 2 V - | -24 | J322-2, A |
| VS5 STA 2 V - | VS5 STA 2 S+ | -26 | J322-2, |
| VS8 STA 2 V - | VS8 STA 2 S+ | -33 | J322-2,V |
| vS8 STA 2 S+ | VS8 STA 2 V - | -35 | J322-2, S |

(continued on the following page)
V. P10-1140 MUX and 11VRGLTR (Schematic 12)

Change From:


To:


Add

IV. P11-1140 Multiplex (Schematic 13)

Add


Note: For Mod 651 the following descriptions should be used for V1, V2, V3, and V4.

V1, V2, V3, V4 (S+), add (Mod 651 V-)
V1, V2, V3, V4 (O+), add (Mod $651 \mathrm{~V}+$ )
V1, V2, V3, V4 (0-), add (Mod $651 \mathrm{~S}+)$
V1, V2, V3, V4 (S-), add (Mod $651 \mathrm{~S}-)$

Submitted by Dave Huntley, Production Engineering

> -- Inserted by Ron Lang $94-816$, Ext. 1015
$92-515$
MICHAEL A MIHALIK
COMBINATION WIZARDS

