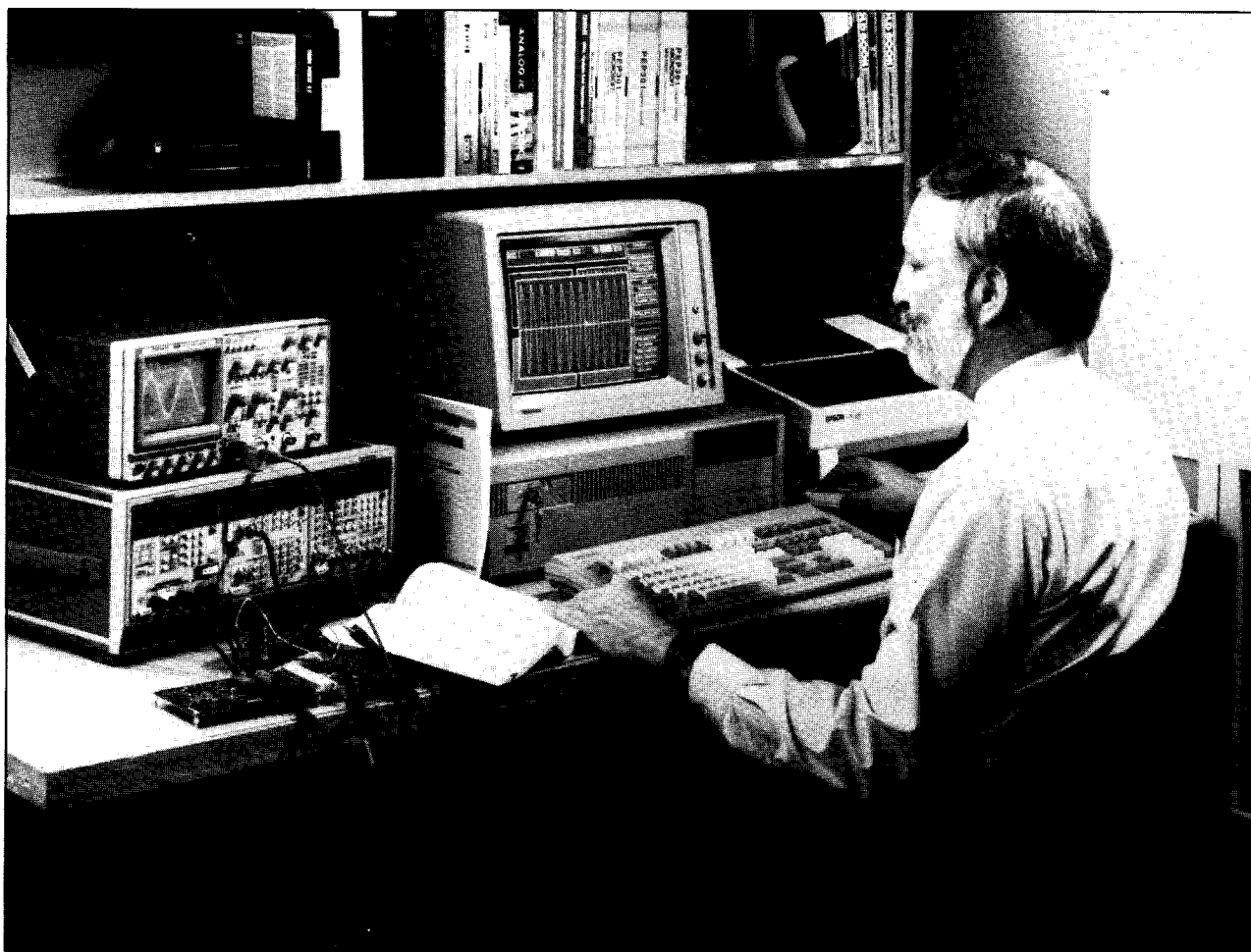


SERVICETEKNOTES

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PTS101

Personal Test System for Dynamic Characterization of A/D Converters



PTS101 shown with the Tektronix 2245 Oscilloscope and auxiliary TM 5000

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PTS101 Personal Test System for Dynamic Characterization of A/D Converters

Features

- Instant A/D converter test results through fast operation
- Highly interactive software for easy parameter changes
- Built-in functions library of common operations to speed testing
- Easy for new and occasional users to learn and operate
- Open software architecture, for easy expansion

Applications by A/D Usage

- Evaluate Video A/D Converters
- Simulate Ideal A/D Converter Systems
- Evaluate Acoustic A/D Converters

Applications by Job Function

- Engineering Evaluation of A/D Converter Design
- Component Engineering Evaluation
- Incoming Inspection
- A/D Module Production Test
- Evaluate Digital Storage Oscilloscope Performance

The Tektronix PTS101 Personal Test System provides dynamic testing and characterization of A/D converters to 20 megasamples per second (MSps) and 10 bits (400 KSps and 12 bits with the optional SG 5010 signal generator).

You will find that system operation is fast, simple, and readily understandable, whether you use the equipment daily or only occasionally. All operations are mouse based and menu driven. With simple operation and concise documentation, the typical new user can get up to speed within an hour.

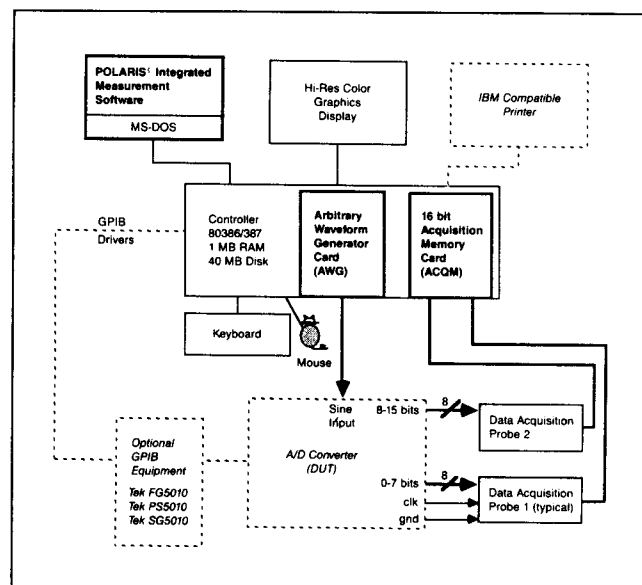
Proprietary Tektronix windowed software provides a user-friendly interface that controls both the measurement sequence and all system elements, including PC instrumentation and auxiliary GPIB instruments. You select tests from a menu window. Five waveform windows display test results, and a conversational window prompts you for your input.

The software features a proprietary high-performance effective-bit measurement algorithm for dynamic A/D testing, plus spectrum analysis and histogram software for complete device characterization. Tests available include:

- Effective Bits
- Flattop FFT
- Spectral Averaging
- Histogram
- Signal to Noise Ratio
- Differential Nonlinearity
- Transfer Curve
- Effective Bits Curve

System Components

An integrated hardware and software system, the PTS101 system includes the PEP 301 Instrument Controller with Arbitrary Waveform Generator Card, Acquisition Memory Card and Probes, plus POLARIS® system software. This is shown in the system block diagram (below).



High-performance Hardware

Instrument controller. The Tektronix PTS101 Personal Test System uses the high-performance Tektronix PEP 301 Instrument Controller. The new PEP 301 features 32-bit architecture and runs at 16 MHz. The controller includes an 80387 co-processor,

1 MByte RAM expandable to 16 MBytes, full-height 40 MByte hard drive, and half-height 1.2 MByte floppy drive. It features a high-resolution 640 by 480 EGA computer graphics board and monitor and a 101 Key, detachable keyboard.

Internal Hardware. The system's *Arbitrary Waveform Generator Card* provides high-performance sine, square, sawtooth, and triangle waves, and white noise, required for testing A/D converters. The output is 1 volt peak-to-peak into 50 ohms, and the sine wave signal range is 1 Hz to 6.7 MHz with 1.25 Hz resolution. It features a harmonic distortion of at least 60 dB down for signals up to 5 MHz and at least 57 dB down for signals to 6.7 MHz.

The *Acquisition Memory Card and Acquisition Probes* acquire up to 16 data channels plus clock at a sample rate of up to 20 MSps. The card has a 4K-deep memory. When the clock line is active, the ACQM Board acquires data in a First In, First Out (FIFO) fashion. When you select Acquire Signal in the menu window, acquisition stops and the data is copied from ACQM memory into the controller memory, making it available for processing.

The *GPIB PC Card* lets you add additional GPIB instruments, such as Tektronix TM5000 Series power supplies, high-performance generators, counters, DVMs, and oscilloscopes. All GPIB instruments are easily controlled through the windowed software.

Highly Interactive Tektronix POLARIS© Software.

Design and test engineers will find the PTS101 system software ideal for their purposes. The highly interactive mouse-based interface allows for fast changes in parameters and instantly displays results in color graphics on a windowed display. A library of built-in functions makes common operations easy and flexible. The system is easily expanded when you wish to add more functions, by adding additional procedures.

Tektronix POLARIS© software is written in Turbo-Pascal© Version 4.0 and uses the National Instruments GPIB drivers.

All major function selections are shown on the system's main menu. Operational functions are available through the appropriate sub menu selection.

Easy operation. Because the PTS101 is designed to be easy to use, most users can become proficient in using the system within one hour. The mouse is used to select functions in the system, while parameters are entered through the keyboard in response to the prompts displayed in the conversational window.

Printers Supported

The system supports Epson® compatible graphics dot-matrix printers that use the standard Centronics printer interface.

Turbo-Pascal® is a registered trademark of the Borland Company.

National Instruments® is a registered trademark of National Instruments Corporation.

Epson® is a registered trademark of the Epson Computer Corporation.

For further information, contact:

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**MICROLAB: MODIFICATION
REVISION FOR Z80B PERSONALITY
CARD**

REF: CORPORATE MODIFICATION
#M44307

Wizards' Workshop, Issue: 13-7,
"MICROLAB: NEW Z80
PERSONALITY CARD"

Z80 PERSONALITY CARD
SUPPLEMENT, P/N 070-2861-01

The modification referenced above had a parts list error that caused two components to be placed in the wrong circuit locations on the board. This resulted in a 74LS109 being placed in location U2010 and a 74S109 being placed in location U4010. The correct placement should have the 74S109 in U2010 and the 74LS109 in U4010.

All of the Z80B Personality Cards (P/N 018-0156-01) shipped up to now have this incorrect parts placement. Most of the Personality Cards apparently work fine with this placement error. Recently, however, some cases were reported where the Personality Card would not work with the latest version of the Z80B emulator running at 6 MHz but it would work at 4 MHz. It also worked with the first version of the Z80B emulator. In these cases, the clock signal output on pin 6 of U2010 did not have a 50-50 duty cycle.

The symptoms of the problem will show up when an attempt is made to run the Personality Card monitor program with an emulator in emulation mode 2. Sometimes the monitor will not start and other times it will start but die quickly before the "HELLO" message is displayed. If these symptoms or any other abnormal operations are encountered, check U2010 pin 6 with an oscilloscope. If the clock is not close to a 50-50 duty cycle, replace U2010 with a 74S109 (P/N 156-1061-02).

The parts list and schematic diagram of the referenced supplement should be updated to reflect this change.

W2 Issue: 18-10

**PG606A: VARIABLE AMPLITUDE
LOCKUP**

Mod: #65878

S/N: B010166

Some early production PG506A's exhibit an error display lock-up when the variable amplitude control is slowly rotated through the zero error region. This lock-up is caused by DVM oscillation.

To correct the lock-up, remove A2U3080, Tek P/N 156-0582-00, and install a 74F00 at A2U3080, Tek P/N 156-1707-00. Also, add A2C3072, a 1000 pF capacitor, Tek P/N 281-0770-00, in parallel to A2R3070. These changes have been installed at the factory in all PG506A's starting at S/N B010166.

W2 Issue: 18-8

**S3220, S3225, 1804V (S3270), 1809V
(S3295) SERIES: HEATER ELEMENT
MODIFICATION EFFECTS PART
DESCRIPTION.**

REF: S3220, S3225, S3270 AUTOMATED
TEST SYSTEMS 1804V TEST
STATION ADDENDUM TO 1804B
TEST STATION, VOLUME 2 (061-
2867-00)

1809V TEST STATION VOLUME 2,
(Parts List) (061-2849-00)

CORPORATE MODIFICATION #63563

SERVICE UPDATE PLAN #2041

A Reliability Modification effects documentation changes for the 1809V Test Station Volume 2 (Part List) Manual, and the 1804V Test Station Volume 2 (Addendum to 1804B) Manual.

The above referenced Modification changes the Current Rating of the "Heating Element" - which is a replaceable part inside the A/B Thermal Circuit Breaker, CB10. The Heating Element monitors input current to protect the blower motor windings against possible over-current which might damage the motor windings in an overload condition.

1809V (S3295):

The change is to be made in the Replaceable Mechanical Parts section for Figure 7, Blower Assembly, page 10-24, Index No. 7-22. The Heater Element (119-1675-00) is described as having a 10.8 Amp current rating. However, due to the Modification, the current rating has changed to be 7.72 Amp and is used for 60 Hertz power.

Heater Element (119-2877-00) has a 10.8 Amp current rating and is used for 50 Hertz power (Export Power Option).

The following entries reflect the Heater Element Modification changes. Your 1809V Part List

Manual, on page 10-24, should be made to read:

-22A 119-1675-00 HEATER,ELEM,SW:
7.72 A (60 Hz).

-22B 119-2877-00 HEATER,ELEM,SW:
10.8 A (50 Hz).

S3220, S3225, and 1804V (S3270):

The Heater Element part numbers/descriptions are the same for the S3220, S3225, and 1804V (S3270). However, the Heater Element part number has not been entered into the 1804V Test Station Manual; as it has been for the 1809V Test Station Manual.

Heater Element part numbers and descriptions should be added to the 1804V Test Station Manual. A logical location is Figure 2, Frame and Rear Panels, in the Replaceable Mechanical Parts section, page 3-5. Index 2-16, pictorial represents CB10. One possible method would be entering the Heater Element part numbers after the Index [2-16] description. The new entry might read as follows:

-16 --- CIRCUIT BREAKER:(SEE
CB10 REPL):

119-1675-00 HEATER
ELEM,SW: 7.72 A (60 Hz).

119-2877-00 HEATER,
ELEM,SW: 10.8 A (50 Hz).

The entry changes have been made to avoid performance degradation which might occur if an incorrect Heating Element is used.

If the incorrect Heating Element were used with 60 Hertz power, then the Heating Element would require more current to trip CB10 than what it would take to damage the motor windings. Similarly, if the incorrect Heating Element were used with 50 Hertz Power, then CB10 might trip under normal Test Station operation.

W2 Issue: 18-9

S3200/1804V: MC3 UNDERSOCKET TEST FIXTURE

REF: Data Sheet, P/N 062-8111-00
Corp. Mod #60980

If the MC3 Undersocket Test Fixture (P/N 067-1195-00) is installed upside down, and power to the test station is turned on, damage to the fixture can occur plus several fuses located on the card nest mother board will blow.

To help insure correct installment, a handle with an arrow and "UP" engraved on it can be added to the fixture. Part number for the handle is 407-3558-00, using four mounting screws P/N 211-0601-00.

W2 Issue: 18-5

S3200: 1140 POLARITY REEDS INSTALLATION PRECAUTIONS

REF: 1140 MANUAL P/N 070-3108-01

On the main program boards for the 1140, P/N 670-1297-02 and for 1140 #2, P/N 670-5831-01 there are eight polarity reed switches for each VS supply. Presently, there are two qualified manufacturers for the reed switches, P/N 260-1137-00.

The original reed switch from Gordos Corporation can be identified by a flattened lead on one end. During installation the flattened lead is placed down through the relay coil. This ensures the switch contact is not shorted by mercury and will function properly.

The second reed switch is manufactured by Electronic Applications Company and is not identified by markings on either lead. When installing the newer reed switch, the technician

should position the reed so the contacts are up and the mercury is down in the glass envelope and not shorting the contacts.

For both installations the reed switches should be centered within the relay coil for proper operation. The two reed switches have identical specifications and may be mixed and used as necessary.

W2 Issue: 18-7

S3200: SM-2 DECODER CIRCUIT BOARD REPLACEABLE PART CHANGE, MOD #52500

REF: SM-2 MANUAL, P/N 070-3176-00

On the SM-2 Decoder Circuit board, P/N 670-3241-00, the 4 to 1 decoders P/N 156-0314-00 are no longer available from the vendor.

In case of failures of U21 through U26, replace the decoder IC's with Dual 2 to 4 Line Decoder/Demux IC's, type 74LS139, P/N 156-0541-02.

Please change the Electrical Parts List on page 8 of the SM-2 manual to indicate the new part numbers for U21 through U26.

W2 Issue: 18-9

**S3225: D25 PIN ELECTRONICS
MANUAL**

STS Documentation has released the new D25 Pin Electronics Card Assembly Manual for purchase through CMS. Part number for the manual is 070-5803-00.

W2 Issue: 18-6

**S3260/S3270/S3275/S3280:
SOFTWARE RELEASE NOTES FOR
1987**

Refer to Pullout "A" for a listing of software changes to TEKTEST III that occurred during 1987.

W2 Issue: 18-4

**S3295: CLOCK GENERATOR
CALIBRATION INFORMATION.
MODIFICATION #64157**

REF: MANUAL P/N 061-2844-00
RECAL MANUAL P/N 070-5666-01

When using FAZCAL.TEK, (C081.TSK), to adjust the Start and Width Delay elements on the Quad Delay boards, the software may display a message, "Select RXXX on the Quad Delay board". The DC5010 counter is expecting a pulse width between 10 ns and 14 ns. When the measured pulse is not within this window the

RXXX message is received. Modification #64157 defines the resistors, R037, R039, R137, R139, R237, R239, R337, and R339 as the selectable resistors RXXX, depending on the phase being adjusted. The selectable range for these resistors is 143 ohms to 205 ohms. If the counter measures a pulse width within the specified window no message is received. If the pulse width is just within the window, but at either extreme of the range, difficulty might be encountered in obtaining an acceptable DESKEW window when running DC02.

Field Service Specialists have determined that the most common acceptable range for RXXX, to optimize the expected pulse width is 169 ohms to 190 ohms. When it is necessary to select RXXX on the Quad Delay boards, the technician can observe the actual counter pulse width for the phase start delay or width delay being adjusted by using an oscilloscope and looking at J031, J032, J131, J132, J231, J232, J331, or J332 respectively. A median or optimum pulse width here would be 12 ns plus or minus 0.5 ns.

If the pulse width limits expected by FAZCAL were reduced or redefined so the counter reading would give a pass indication only when the expected pulse is at optimum width, the manual procedures described above would not normally be required. With the current version of FAZCAL, it is recommended that the technicians observe and optimize the pulse to ensure universal application of the Quad Delay boards, taking into account differences in Clock Generator and system skew.

W2 Issue: 18-5

**S3295: CLOCK GENERATOR DESIGN
IMPROVEMENT, MODIFICATION
#64158**

REF: MANUAL P/N 061-2887-00

The High Resolution Clock Generator Cycle Length Board, P/N 670-8219-02 is being modified to prevent U221 on the Interface Board from being overdriven. When the input signal to U221 is below the manufacturers specified limit of -0.3 V, logic errors might occur. Before this modification, the data bits used to select the desired clock phase might get corrupted. The modification involves using a voltage divider to attenuate the signal to the flip-flop, U221. A 100 pF capacitor is used to compensate for the slowed falling edge of the TS ENABLE signal. Also, a Schottky diode is added to prevent the ECL to TTL converter transistor, (Q340) from saturating.

After the modification, the Cycle Length Board part number changes to 670-8219-03. The Cycle Length Assembly will change to 672-0087-01.

STS Field Service Specialists are requested to install this modification to the Cycle Length Boards during a scheduled P.M., or just prior to a system calibration.

MODIFICATION PROCEDURE:

1. Cut the circuit board run in the collector circuit of Q340 as shown in Figure 1*. This should be done on the back of the circuit board using an X-Acto knife or Dremel tool.
2. Add the 330 ohm resistor (R342), P/N 315-0331-00, and the 100 pF capacitor (C340), P/N 281-0765-00, as shown in Figure 1.
3. Remove the existing diode (CR340), P/N 152-0141-02, from the component side of the board (Figure 2).
4. Install the new CR340 Schottky diode, P/N 152-0725-01 from Collector to Base of Q340

(Figure 2). The before and after circuit diagrams are shown in Figures 3 and 4.

***Note:** Figures 1, 2, 3, and 4 are found in Pullout "B".

W2 Issue: 18-5

**S3295: PATTERN PROCESSOR AND
PATTERN EXPANDER WIRE HAR-
NESS SERVICEABILITY IMPROVED,
MOD #66156**REF: Manual, 1809V Volume 4,
P/N 061-2847-01, Page 12.7-1

The Pattern Processor and Expander data is routed to the 1809V Test Station Junction Panel, A19 via the wire harness P/N 179-2922-01. The reliability of the wire harness should be greatly improved with the replacement of the Spectro-Strip connectors by Middco connectors.

Mod #66156 establishes field replaceable sub-parts of the 179-2922-01 wire harness. The individual wire assemblies with the new connectors attached will be orderable for field replacement. There are three different lengths of wire assemblies that make up the harness. These are the three recently established FRU's. P/N 174-1328-00 is 339 inches. This length is used in the Pattern Processor, (A65). P/N 174-1329-00 is 279 inches. This length is used in the Pattern Expander, (A63). P/N 175-8763-00 is 259 inches. It is used in the Pattern Processor, (A65A101J1). There is another 64 pin wire assembly used in the 1809V Test Station which is also modified to use the new Middco connectors. P/N 175-8173-00 is 83 inches and is used from the Junction Panel, A19J968 to the Error Logic board, A31J710.

Consult the 1809V Wire List manual referenced above for the appropriate connector numbers for the type I and type II Processors and Expanders.

W2 Issue: 18-6

**TSG170A/SPG170A/ECO170A/TSG300/
TSG271/SPG271: POWER SUPPLY
RELIABILITY IMPROVEMENT**

TSG170A INSTRUCTION MANUAL
P/N 070-5680-00

SPG170A INSTRUCTION MANUAL
P/N 070-5965-00

ECO170A INSTRUCTION MANUAL
P/N 070-6113-00

TSG300 INTERIM MANUAL
P/N 061-3302-00

TSG271 INTERIM MANUAL
P/N 061-3457-00

SPG271 INTERIM MANUAL
P/N 061-3546-00

Mod: #65537

Mod #65537 has been implemented in the listed instruments to provide improved reliability in the A4 power supply board. CR360 has been changed to a new part, P/N 152-0914-00, that provides increased reverse breakdown voltage margins.

Install the new part on the listed instruments serviced for power supply failures.

Mod #65537 is being installed in new instruments from the factory starting with the following serial numbers:

TSG170A	B031191
SPG170A	B010413
ECO170A	B010231
TSG300	B020576
TSG271	B020257
SPG271	B010115

W2 Issue: 18-6

TSG271: FIRMWARE UPDATE

REF: TSG271 INTERIM MANUAL
P/N 061-3457-00
Mod #65679

In order to improve some of the remote control operation parameters, and to improve instrument performance in the presence of noise, some changes have been made to the software code in A2-1U333.

A new P/N 160-4338-02 should be installed at A2-1U333, as required, to address noise and remote control problems.

This change will be in new instruments from the factory starting with S/N B020270.

W2 Issue: 18-8

TSG271/SPG271: CHANGE TO MEET BLANKING SPECS

REF: TSG271 INTERIM MANUAL
P/N 061-3457-00

SPG271 INTERIM MANUAL
P/N 061-3546-00

Mod: #66296

Mod #66296 has been implemented in the TSG271 and SPG271 in order to bring Comp Blanking and Comp Sync, specs in line with industry requirements.

A2-1U780 is being replaced with a kit, P/N 050-2376-00.

Order this kit and install in all TSG271's or SPG271's returned for service.

Orders for P/N 050-2376-00 will be referenced to Parts Notice 73, which will provide a no-cost transaction.

Mod #66296 is being installed in new instruments from the factory starting with S/N B020335 (TSG271) and B010150 (SPG271).

W2 Issue: 18-6

TSG300: FRONT PANEL/FRONT FRAME CHANGES

REF: TSG300 INTERIM MANUAL
P/N 061-3302-00

Mod: #63471

Due to a change to a new vendor, some physical changes have been made in the front panel, P/N 333-3278-00. The new replacement part, P/N 333-3278-01, will also have new nomenclature associated with some of the function switches. These were implemented with the addition of MII signal sets per Mod #64075.

Mod #63471 also makes some changes to the front frame to accommodate the new front panel. The new front frame part number is 426-2116-01.

NOTE: Front Frame P/N 426-2116-00 will still be appropriate for pre-mod instruments.

These changes are to be installed on an "as-fails" basis.

Mod #63471 will be installed in new instruments from the factory starting with S/N B020477.

W2 Issue: 18-6

TSG300: MII BOWTIE SIGNAL AMPLITUDE CHANGE

REF: TSG300 INTERIM MANUAL
P/N 061-3302-00

Mod: #65802

Mod #65802 has been implemented in the TSG300 to change the amplitude of the Y channel MII 60 Hz 2-wire Bowtie signal from 700 mV to 495.54 mV.

Since this change involves signal data stored in 8 memory devices, the modification can be accomplished using a kit, P/N 020-1584-03.

The memory devices affected by this kit are U335, U340, U345, U351, U535, U540, U545 and U551.

Install this change as required.

Mod #65802 is being installed in new instruments from the factory starting with S/N B020571.

W2 Issue: 18-6

WFM300: CENTER DOT DRIFT WITH TEMPERATURE

REF: WFM300 INSTRUCTION MANUAL
P/N 070-6039-00
Mod #66452

New WFM300's will now have a modification installed that is designed to eliminate a small amount of horizontal center dot drift that was seen at elevated temperatures.

The change consists of altering the value of A3R843 from 27 K ohms to 13K ohms (P/N 315-0133-00), and installation of this change is recommended on an "as required" basis to address the stated symptom.

This change will be factory installed starting with S/N B010761.

W2 Issue: 18-8

WFM300: ELECTRONIC GRATICULE IMPROVEMENTS

REF: WFM300 INSTRUCTION MANUAL
P/N 070-6039-00
Mod: #66285

Mod #66285 makes changes to the electronic graticule to address the following:

- An opening in the YL box when in the Lightning/100% mode.
- An opening in the YL box when in the Vector/100%/Line Select mode.
- A tail on the G box when in the Vector/GBR/Line Select mode.

The change is accomplished by changing A4U268 to P/N 160-4196-03 in the standard instrument, and to P/N 160-4258-03 in the Option 10 instrument.

Mod #66285 will be installed in new instruments from the factory starting with S/N B010737.

W2 Issue: 18-6

110S/110RC: REMOTE CONNECTOR CHANGE

REF: 110S SERVICE MANUAL
P/N 070-4423-01

Mod: #64884

Our vendor has discontinued manufacturing P/N 175-7715-00, which is the 110S/110RC Remote Control connector.

Since the replacement part is not directly compatible, the following kit part numbers have been established to effect repair.

- For the 110S, order 050-2329-00
- For the 110RC, order 050-2328-00

These parts are to be replaced as they fail.

Mod #64884 is being implemented in new instruments from the factory starting with S/N B020590 (110RC), B031070 (110S Opt. 20) and B021065 (110S).

W2 Issue: 18-6

118AS: FINISHED MANUAL AVAILABLE

REF: 118AS INSTRUCTION MANUAL
P/N 070-5114-00

Mod: #65076

Now that the 118F02 Field Upgrade Kit is being installed in 118AS's from the factory, the 118F02 Instructions have been included in the 118AS Manual.

The complete manual is available as P/N 070-5114-00, and is being shipped with new instruments from the factory starting with S/N B030292.

W2 Issue: 18-6

122X: TRIGGER OUT CHECK

REF: 1220/1225 Service Manual
P/N 061-3473-00

SERIAL NUMBERS: All

The current service manual for the 122X does not contain a check for the trigger out signal.

The next printing of the service manual will contain the following procedure for trigger out verification.

1. Enter the following information to configure the 1220/1225 to perform the Trigger Out test.

Menu	Value
-----	-----
Mem Config (Menu, 0)	Presample [0512] Run [when ready] Update Memory [1] [on completion]
Display Re-run	[Timing] [on start]
Timebase (Menu, 1)	A Async 25 MHz Off B X X X C X X X
Trigger Spec (Menu, 2)	1 FOR [00001] : IF [TRIGIN] NEXT: THEN [STRTXO] 2 FILL

2. Connect channel 0 of the A analyzer probe to the trigger out BNC of the 1220/1225.
3. Press the START key on the 1220/1225 and verify the acquisition of the trigger out pulse on channel 0 of the A analyzer.

The positive pulse will be within several clock cycles of the trigger mark.

W2 Issue: 18-3

370/371: PLOTTER COMPATIBILITY

Below is a listing of plotters that have been verified to be compatible with the Sony/Tek 370 and 371 Curve Tracers.

370*/371 GPIB Interface

- Tek HC 100
- Fujitsu FPG-310 with FPG-315-201 I/F
- HP 7440A (Color Pro)
- HP 7470A
- HP 7475A
- HP 7550A

*Requires 370 Version 2.0 (or higher) Firmware.

370/371 Centronic Interface

- Tek HC 100
- Fujitsu FPG-310 with FPG-315-101 I/F
- Epson HI-80S with Centronic I/F

When using the GPIB Interface, the rear panel address switch must be in Address 31.

W2 Issue: 18-3

371: PATCH CORDS

REF: SERVICE MANUAL
P/N 070-684-00
Pages 4-7 & 8-14

When doing the performance check it is imperative that low resistive patch cords be used to perform several checks. If low resistance leads are not used, some high current checks will fail specifications.

Using leads such as nickel plated ones can also cause excessive wear and damage the gold plated connectors on the porch of the 371.

The recommended patch cords are available as a wire set, P/N 198-5621-00. We also recommend ordering wire set P/N 198-5622-00 which is also gold plated but has spring clips on one end.

W2 Issue: 18-7

520A SERIES: ACCURATELY MEASURING THE QUADRATURE ERROR OF COLOR BAR GENERATORS

REF: 520A INSTRUCTION MANUAL
P/N 070-1709-00

521A INSTRUCTION MANUAL
P/N 070-1794-00

A recent inquiry about a good way to accurately measure quadrature error with the 521 Vector-scope has prompted the following suggestions.

Quadrature error measurement using a vector-scope is, at first glance, fairly straight-forward since the vector display allows an immediate assessment of angular relationships. However, upon closer examination, one might find it a bit difficult to quantify these angular relationships where quantities of less than 1° are of interest.

Accuracies of less than 1° should be easy to achieve if the calibrated phase dial is used to your advantage. Try the following procedure. (Note: This procedure assumes that the Color Bar

Generator under test has the capability of disabling the U and V Axes via a switch, jumper, etc.)

1. Apply the signal of interest to the CHAN A input connector of your 521A.

2. Select A CAL and adjust the front panel QUAD PHASE control for best test circle overlay.

Note: For reference purposes, the approximate quadrature error within the 521A is 0.2° to 0.3° for two finely focused test circles that just touch.

3. Select CH A, VECTOR, and +V modes, and set the calibrated phase dial to 0° .

4. On the generator under test, disable the U component of the color bar signal. You should now have two displayed signals that fall very nearly along the V axis when the burst vectors are on their respective targets.

5. Use the CH A PHASE control to carefully overlay the vector dots. Using the CH A GAIN control to place the outer dots near the compass rose and using a low intensity, finely focused trace will enhance your accuracy.

6. Once you have achieved optimum dot overlay on the V axis, enable the U axis component and disable the V axis component at the generator.

7. Now, by carefully overlaying the U axis dots using the calibrated phase dial, the quadrature error can be read directly from the dial scale.

The procedure for making this same measurement with a 520A in the NTSC system is quite similar. The differences are that R-Y substitutes for U, and B-Y for V. Also, in order to get the two signal comparison display in a 520A, the 0° - 180° switch circuitry must be enabled in the Vector mode by an internal wiring change. Simply disconnect the lead going to pin 0 of the Demodulator board.

W2 Issue: 18-6

650HRC: PROCEDURE UPDATE FOR MII STANDARD

REF: 650HRC INSTRUCTION MANUAL
P/N 070-2646-02

Enclosed with this issue as **Pullout "C"** are the new calibration procedures that will allow the 650HRC to be properly adjusted for the MII analog component standard.

New 650HRC manuals will have this information included.

W2 Issue: 18-8

760: BOARD CHANGE TO PREVENT CABLE DAMAGE

REF: 760 INSTRUCTION MANUAL
P/N 070-5992-00
Mod #64543

Starting at S/N B020593, new 760's will have a Main Board that has had the connectors for J115 and J413 redesigned to provide increased vertical clearance.

J115's connector was changed to one with a right angle configuration, P/N 131-3363-00, and J413's connector was replaced by 20 terminal pins, P/N 131-0608-00.

In addition, the 20 wire cable has been secured to the 34 wire cable with a strain relief, P/N 358-0723-00.

These changes are for your information only. Removal and replacement of the connectors is only recommended upon failure.

An additional change in these newer instruments is to C254. A new part, P/N 290-0536-00, will provide better resistance to oscillations occasionally seen in the -12 V regulators. The capacitor should be changed when required to address this symptom.

W2 Issue: 18-8

1410R/SPG2A: TRANSISTOR CHANGES

REF: 1410R INSTRUCTION MANUAL
P/N 070-2759-00

SPG2A INSTRUCTION MANUAL
P/N 070-2104-00

Mod: #64660

Due to vendor quality improvements, the following transistors will no longer be burned-in, and the replacement parts will be as listed for the 1410R/SPG2A.

<u>CIRCUIT #</u>	<u>CURRENT P/N</u>	<u>NEW P/N</u>
Q550, Q560	151-0325-01	151-0325-00
Q578	151-1005-02	151-1005-00
Q725	151-0367-01	151-0367-00

Install the new parts upon failure.

Mod #64660 is being installed in new instruments from the factory starting with shipments in November, 1987.

W2 Issue: 18-6

1480 SERIES: HORIZONTAL DISPLAY SHIFT WITH CHANGE OF SWEEP FUNCTIONS

REF: 1480 SERIES INSTRUCTION
MANUAL, P/N 070-2338-00

Mod: #64940

Mod #64940 adds the circuit changes necessary to reduce a horizontal shift in the display when switching from 10 μ sec per division to other sweep functions. (Article continued on the next page)

**1480 SERIES: HORIZONTAL
DISPLAY SHIFT WITH CHANGE OF
SWEEP FUNCTIONS** *(Continued from previous
page)*

The mod consists of adding 10K ohm resistors, P/N 315-0103-00, between the bases and emitters of Q4090 and Q4310, which will shunt leakage currents around the transistors and provide adequate cutoff.

This change should be installed as required.

In addition, this mod changes Q4312, Q4313 and Q4410 to non-selected parts, P/N 151-0190-00. This part of the change can be made upon failure of the affected devices.

Mod #64940 is being installed in new instruments from the factory starting with S/N B094654 (1480C Series) and B106410 (1480R Series).

W2 Issue: 18-6

**1480 SERIES: OPTION 6 & 7 SLOW
SWEEP TRIGGER IMPROVEMENT**

REF: 1480 SERIES INSTRUCTION
MANUAL, P/N 070-2338-00

1480 SERIES OPT. 6
INSTRUCTION MANUAL
P/N 070-2064-00

Mod #65536

To improve slow sweep triggering when bounce signals are applied, the trigger comparator has been changed as follows.

On the Slow Sweep board, A13, resistor R9412 has been changed to a "test selectable" with a nominal value of 64.9K ohms (P/N 321-0367-00) and a range of selection of $\pm 8K$ ohms.

To properly select this part when the nominal value may be inadequate, the technician should choose a value such that both parts B and C of Performance Check Step 43 function as stated in the manual.

This change will be installed in new instruments from the factory starting with S/N B094615 (1480C) and B106311 (1480R).

W2 Issue: 18-8

**1710B: DC RESTORER OPERATION
IMPROVEMENT**

REF: 1710B INSTRUCTION MANUAL
P/N 070-5522-00

Mod: #66179

Mod #66179 alters the operation of the 1710B's DC restorer circuitry to accommodate signals with shorter back-porch times, such as those from the TSG170A.

On the Main Board (A3), R675 has been changed from 26.1K ohms to 22.1K ohms, P/N 321-0322-00.

Install this mod where required.

Mod #66179 will be installed in new 1710B's from the factory starting with S/N B021582.

W2 Issue: 18-6

**1710B SERIES/1720 SERIES/1730
SERIES/1705 SERIES/WFM300:
CHANGE TO CRT HEATER VOLTAGE**

REF: 1710B INSTRUCTION MANUAL
P/N 070-5522-00

1720 INSTRUCTION MANUAL
P/N 070-5846-00

1730 INSTRUCTION MANUAL
P/N 070-4474-02

1705 INSTRUCTION MANUAL
P/N 070-6355-00

WFM300 INSTRUCTION MANUAL
P/N 070-6039-00
Mod #65298

Mod #65298 has been implemented in the listed (above) instruments in order to extend CRT life. The change consists of a new value for R124 on the Power Supply board. The new value to use is 10 ohms (P/N 315-0100-00).

Install this new part on any of the listed instruments brought in for service, if not already done.

This change will be factory installed starting with the following serial numbers.

1705	B020321
1710B	B021445
1711B	B020297
1720	B013189
1721	B011056
1730	B023586
1731	B021129
1735	B010166
WFM300	B010631

W2 Issue: 18-8

**1710B SERIES/1720 SERIES/1730 SE-
RIES/WFM300: GRATICULE LAMP
RELIABILITY IMPROVEMENT AND
HARD-WARE CHANGE**

REF: 1710B SERIES INSTRUCTION
MANUAL, P/N 070-5522-00

1720 SERIES INSTRUCTION
MANUAL, P/N 070-5846-00

1730 SERIES INSTRUCTION
MANUAL, P/N 070-4474-02

WFM300 INSTRUCTION MANUAL
P/N 070-6039-00

Mod: #65369

Mod #65369 has been implemented in the listed instruments to address two concerns -- a less than desirable life of the CRT graticule lamps and the possibility of damaging regulator transistors during installation.

To accomplish the improvement in graticule lamp life, the following circuit locations were changed from 10 ohm resistors to 13 ohm resistors, P/N 301-0130-00.

- In the 1710B Series and 1720 Series, A3R152 and A3R163 are changed.
- In the 1730 Series and WFM300, A3R222 and A3R257 are changed.

To prevent damage to the two regulator transistors that are located on each of the listed instruments' Main Boards, the 4-40 Hex nut is changed to one with a .188" diameter, P/N 210-0406-00.

Install the resistor change where graticule lamp failure has been a problem, and install the new hex nut whenever one of the regulator transistors is replaced. (Article continued on the next page)

1710B SERIES: RELIABILITY IMPROVEMENT & HARDWARE CHANGE*(Continued from previous page)*

Mod #65369 will be incorporated in new instruments from the factory starting with the following serial numbers:

1710B	B021506
1711B	B020309
1720	B013574
1721	B011062
1730	B023962
1731	B021215
1735	B010191
WFM300	B010685

W2 Issue: 18-6

1711B/1731/1735: GRATICULES CHANGED TO INCLUDE 12.4 HORIZONTAL DIVISIONS

REF: 1710B SERIES INSTRUCTION
MANUAL, P/N 070-5522-00

1730 SERIES INSTRUCTION
MANUAL, P/N 070-4474-02

Mod #65861

Due to customer input, the Horizontal scale of PAL graticules in the listed instruments has been changed to reflect 12.4 divisions.

Since this is an internal CRT graticule, the change will be seen by our customers only when a new instrument is purchased, or when a CRT is replaced due to failure. There will be no formal update program.

In the 1711B and 1731, CRT P/N 154-0904-01 changes to 154-0904-02. In the 1735, CRT P/N 154-0916-00 becomes 154-0916-01.

The instrument cal procedures, etc., are not affected.

This change will be installed in new units from the factory starting with S/N B020309 (1711B), B021240 (1731) and B010203 (1735).

W2 Issue: 18-8

1720 SERIES: GAIN CHANGES WITH PHASE SHIFTER ROTATION

REF: 1720 SERIES INSTRUCTION
MANUAL, P/N 070-5846-00

Mod #66051

In order to alleviate some gain changes that may be noticed when the phase shifter is rotated, changes have been made to the phase shifter drive circuitry to increase loop gain.

A3R223 is changing from 2.2K ohms to 1K ohm, P/N 315-0102-00, and A3R333 is changing from 18K ohms to 33K ohms, P/N 315-0333-00.

Install this change, as required, to address the stated symptoms.

This change will be installed in new instruments from the factory starting with S/N B013693 (1720) and B011067 (1721).

W2 Issue: 18-8

1730 SERIES: COMPONENT CHANGE

REF: 1730 SERIES INSTRUCTION
MANUAL, P/N 070-4474-02

Mod #66481

Increased reliability of raw parts from our vendors has allowed us to change A3U541 from P/N 156-2009-01 to 156-2009-00 in the 1730 Series.

Use this new part on an "as fails" basis.

This change will be implemented in new instruments from the factory starting with S/N B024507 (1730), B021281 (1731) and B010203 (1735).

W2 Issue: 18-8

**1740 SERIES: REMOTE SYNC CABLE
ADDED TO ALL INSTRUMENTS**

REF: 1740 INSTRUCTION MANUAL
P/N 070-4473-00

Mod: #65731

The remote sync cable, P/N 175-9173-00, that connects A1J226 (Schematic 9) to A4J694 (Schematic 3) will now be included in all 1740 Series Instruments.

Mod #65731 will be installed in new instruments from the factory starting with S/N B024960 (1740), B021864 (1741) and B020502 (1742).

Add the cable to instruments being serviced as required.

W2 Issue: 18-6

**1740 SERIES/1750 SERIES: CIRCUIT
BOARD SHIELD CHANGED**

REF: 1740 SERIES INSTRUCTION
MANUAL, P/N 070-4473-00

1750 SERIES INSTRUCTION
MANUAL, P/N 070-5664-00

Mod: #65235

Due to non-availability of raw materials, P/N's 337-3292-00 and 337-3293-00 will no longer be available.

An alternate source has been obtained, and the replacement parts will be provided as part of the kits.

For 337-3292-00 failures, order P/N 050-2364-00, and for P/N 337-3293-00 failures, order P/N 050-2365-00.

Mod #65235 is being installed in new instruments from the factory starting with the following serial numbers:

1740	B025194
1741	B021893
1742	B020509
1750	B032432
1751	B031270

W2 Issue: 18-6

1750 SERIES: CHANGE TO ALLOW SUFFICIENT ADJUSTMENT RANGE OF R738

REF: 1750 SERIES INSTRUCTION MANUAL, P/N 070-5664-00

Mod #65704 changes two component values to accommodate the tolerance variance of A1R632 ($\pm 20\%$).

A1R738 is changed to a 100K ohm pot, P/N 311-1555-00, and A1R747 is changed to a 130K ohm resistor, P/N 321-0396-00.

Make this change, as required, if the adjustment of R738 has insufficient range.

Mod #65704 is being installed in new instruments from the factory starting with S/N B032338 (1750) and B031238 (1751).

W2 Issue: 18-6

1750 SERIES: PHASE SHIFTED SUB-CARRIER CROSSTALK

REF: 1750 SERIES INSTRUCTION MANUAL, P/N 070-5664-00

Mod: #65461

A small amount of residual subcarrier on the 1750 Series display has been traced to crosstalk from the DeMod board to the Vertical Amp board.

To alleviate this problem, Mod #65461 repositions A3L362 and A3L162 on the Vertical Amp board such that the coil bodies are perpendicular to the circuit board (see Figure 1).

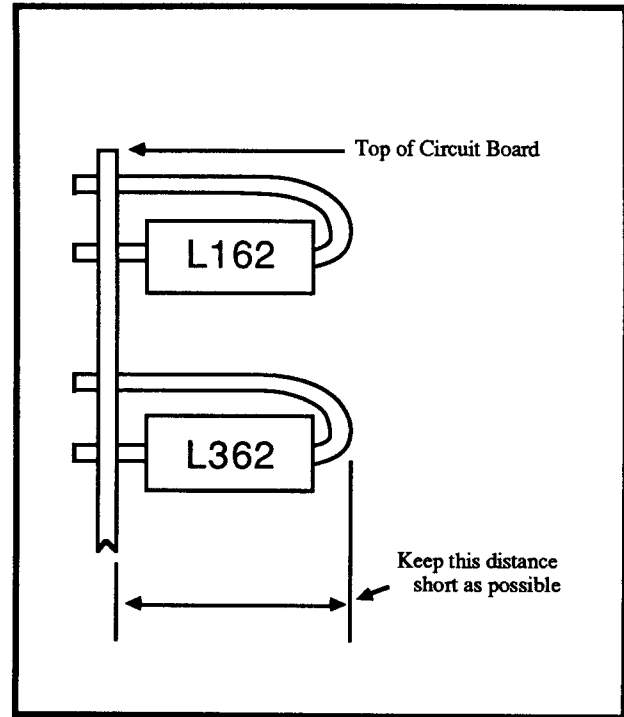


Figure 1

Install this mod, as required, using two new coils, P/N 108-0317-00, in the configuration shown to help address residual subcarrier problems.

Mod #65461 is being installed in new instruments from the factory starting with S/N B032242 (1750) and B031185 (1751).

W2 Issue: 18-6

**1750 SERIES: SURFACE MOUNT
TRANSISTORS ON FRONT PANEL
BOARD NOW AVAILABLE**

REF: 1750 SERIES INSTRUCTION
MANUAL, P/N 070-5664-00

Mod: #65691

The small surface mount transistors that are mounted on the rear of the front panel board are now available for field repair. The part number to order is 151-5001-00.

W2 Issue: 18-6

1804V: MANUAL CORRECTION

Ref: 1804V Test Station
Addendum to 1804B Test
Station, Vol. 2
P/N 061-2867-00

Part numbers for circuit breakers CB13, CB21, CB22 and CB23 listed under the Chassis Parts section of the Replaceable Electrical Parts for the 1804V Test Station are incorrect.

The correct part number for all of the above mentioned circuit breakers is 260-2142-00.

W2 Issue: 18-7

**1809V: AC CONTROLLER CIRCUIT
BREAKER CHANGE, B PHASE
CHANGE #16**

REF: Manual, 1809V Test Station,
Volume 3 P/N 061-2848-00.
Manual, 1809V Test Station,
Volume 2 P/N 061-2849-00.

In the Test Station AC Controller, CB12 and CB13, 20 Amp circuit breakers have been replaced with one 30 Amp circuit breaker called CB12A and CB12B. The part number for the new circuit breaker is 260-2238-00.

All 1809V Test Stations have been updated to include the circuit breaker changes as well as the other wire changes associated with B change #16.

This information is to update the replaceable parts list in the Volume 2 manual. On page 9-11 please change A10CB12 to indicate P/N 260-2238-00. The description is changed to two pole, 30A,120/240V. The parts list entry for A10CB13 may be deleted.

In the Test Station Volume 3 manual, replace the power distribution diagram 1A, with the diagram attached as **Pullout "D"**.

W2 Issue: 18-6

1910: MATRIX SIGNAL LIMITATIONS

REF: 1910 OPERATORS MANUAL
P/N 070-4466-00

When attempting to build a Matrix signal in the 1910, you may encounter what, at first, appears to be a problem if you are trying to define one of the signals as SMPTE Bars, or a few other signals. This is not really a problem, it just requires a work-around.

The situation is that a 1910 Matrix signal will not accept as one of its components another signal that is a split field signal. Some of these are SMPTE Bars, Bars/Y, Bars/Red, Hi-Lo APL Bounce, Field Square Wave, Window and Convergence. For instance, SMPTE Bars consists of EIA Bars, Reverse Blue Bars, and IYQB.

The solution is relatively easy. When defining a Matrix, just use the base signal components that are the desired parts of split field signals. This may seem to limit your selections somewhat, but with over 30 basic patterns to choose from stored internally, the available combinations should satisfy the most demanding test requirements.

Section 6 of the Operators Manual gives thorough descriptions of each signal type, details the components contained in split field signals and provides some application hints.

W2 Issue: 18-8

1910: PART NUMBER CHANGE

REF: 1910 SERVICE MANUAL
P/N 070-4523-00

Mod #65876

Due to increased reliability of parts from our vendors, A10Q805 is being changed to a non-burned in part, P/N 151-0103-00.

The new part number should be used to replace a failed device at Q805.

This change will be factory installed beginning with S/N B021656.

W2 Issue: 18-8

1910: SILICONE TRANSISTOR INSULATORS ADDED

REF: 1910 SERVICE MANUAL
P/N 070-4523-00

Mod: #64725

To improve assembly, appearance and cost, Mod #64725 replaces the Thermal Joint Compound used under Q551 and Q651 with silicon rubber insulators, P/N 342-0363-00.

Use the new insulator whenever one of the affected transistors is replaced due to failure.

Mod #64725 is being installed in new instruments from the factory starting with S/N B021577.

W2 Issue: 18-6

4111/M/4115B/4120 SERIES:
KEYBOARD THUMBWHEEL'S
INCANDESCENT LAMP
REPLACEMENT PROCEDURE

As an alternative for replacing a complete thumbwheel assembly (P/N 263-0018-00) when the thumbwheel's incandescent lamp is burned out, the following procedure can be used to replace the lamp only.

The part number of the incandescent lamp is 150-0057-01.

1. Remove the thumbwheel assembly from the keyboard enclosure.

Note that the black plastic base of the thumbwheel assembly has three posts which run through holes on the circuit board. These posts, which hold the thumbwheel housing to the circuit board, have been melted on the solder side of the circuit board.

2. Using an exacto-knife, carefully trim off the melted black plastic edges on the solder side of the circuit board. Try to trim just the edges and leave as much of the black plastic post as possible.
3. Using the exacto-knife as a wedge and lever, lift the black housing away from the circuit board. You may want to remove the 5/16-inch nut, washer, tension spring, and thumbwheel from the base or leave the thumbwheel on to help in separating the base from the circuit board.
4. Once the thumbwheel assembly has been removed from the circuit board, remove the old lamp and install the new one.

When installing the new lamp, the base of the lamp should be against the circuit board. Also when soldering, add a meter test lead or ground clamp on the lamp wires to sink heat away from the lamp's filament.

The phototransistors can also be replaced, if needed. Their part number is 151-0629-00.

Be sure to check that the new lamp works before assembly.

5. Insert the thumbwheel assembly onto the circuit board and add glue to the posts on the solder side of the circuit board.
6. Reinstall the thumbwheel assembly into the keyboard and allow adequate time for the glue to set before using the thumbwheel.

W2 Issue: 18-7

**4129/4100F59'S: TILING MEMORY
AND 4120F26 COMPATIBILITY**

When upgrading an existing 4129 to a 4126, using the 4120F26 kit, verify that the Tiling Memory board's part number is 670-8569-01 (board located in slot 8 of card cage). If the Tiling Memory board's suffix level is -00, an 050-2139-00 kit must be used for compatibility between the 4126 firmware and the existing Tiling Processor and Memory boards.

This 050 kit contains higher density RAM Memory parts used on the Tiling Memory board and two firmware ROMs to replace the existing firmware on the Tiling Processor board. Adding this kit will allow the Tiling Processor and Memory boards to have a one pass tiling capability, needed for the 4126 firmware.

My thanks go to Ed LoBody, in the Chicago Field Office for his input concerning upgrading a 4129 to a 4126.

W2 Issue: 18-4

**4200 SERIES: SETUP & COMMANDS
TRAINING PACKAGE**

Another 4200 Series training package is available. Previous packages have focused on the hardware. This one covers the basics of how to establish communication parameters for the 4200 series and how to enter commands (using the keyboard or a host). This training is designed for anyone who has completed the 4205/4207 Service Training Package, but has only minimal working experience with 4200 series terminals.

The 4200 Series Setup & Commands Training Package (P/N 062-9703-00) includes:

4200 Series Setup & Commands Training
Workbook
4205/7 Computer Display Operators Manual
4200 Series Reference Guide

In addition to the above three items, you will also need access to a 4200 Series terminal, to complete the training.

If desired, the workbook may be ordered by itself (P/N 062-9702-00) if you already have both the Operators and Reference Manuals. To order the workbook call: 1-503-629-1555, or write: CSG Service Training, M/S: 94-887, Attention: Linda Morrisson. Using microfiche copies of the 4200 Manuals is not advisable for this training, due to the level of interaction between the workbook and manuals; however, using microfiche will be easier after the training is completed, because the training teaches how each manual is organized and how to easily access its information.

W2 Issue: 18-4

TEKTEST III

Cumulative Release Notes for 1987

(for S-3220, S-3250, S-3260, S-3270, S-3275, and S-3280 Test Systems)

A. SYSTEM SOFTWARE CHANGES

1. 410X.TST:SYS (410X.EDT)
[V01.02] Incorrect escape sequence used during terminal setup.
2. 420X.TST:SYS (420X.EDT)
[V01.00] New command to setup Tek 4200-series terminal for Tektest.
3. IP/TC3460.RUN:SYS V04.5
[V04.50] Added support for PDP-11/44 computer with S-3260.
[V04.51] Revised to correct timing problem reading delta-T with PDP-11/84 computer.
4. IP/TC3460.RUN:SYS V04.3
[V04.34] Revised to correct timing problem reading delta-T with PDP-11/84 computer.
5. MONITOR[:SYS] V04.3 (for PDP-11/34, PDP-11/35) (*only required with Networking*)
[V04.3X] Networking bugs and enhancements
 - Action of "/DE" qualifier applied to all successive Network "Copy" operations.
 - Network file transfer now uses ":NET" for destination if IDENT not specified.
 - Network hung when transferring files to nonexistent directory on VAX/VMS host.
[V04.3Y] Networking enhancements for default DRIVE and IDENT selection.
6. MONITOR[:SYS] V04.5 (for PDP-11/44) (*only required with Networking*)
[V04.50] Networking bugs and enhancements
 - Action of "/DE" qualifier applied to all successive Network "Copy" operations.
 - Network file transfer now uses ":NET" for destination if IDENT not specified.
 - Network hung when transferring files to nonexistent directory on VAX/VMS host.
[V04.51] Networking enhancements for default DRIVE and IDENT selection.
7. OPTION.RUN:SYS
[V04.33] Revised for use with Tek 4200-series terminal.

B. VERDICT SOFTWARE CHANGES

1. F040.TST:VDT (T1140A.EDT) (*S-3220, S-3250, and S-3270 only*)
[431003-3270] Revised to also test 1151 Programmable Power Supply (as VS1-VS4 replacement).
2. F050.TST:VDT (TIS1.EDT) (*S-3220, S-3250, and S-3270 only*)
[430700-3270] Revised to also test 1181 Programmable Current Supply (as IS1 replacement).

Software Changes (cont...)

3. F062.TST:VDT (T1151G.EDT) *(S-3220, S-3250, and S-3270 only)*
[928500-3270] New test to verify operation of 1151 Programmable Power Supply with V/I Monitor and GPIB options.
4. F070.TST:VDT (DRIVSH.EDT) *(S-3220, S-3250, and S-3270 only)*
[429101-3270] Revised to work with 1151 or 1140A Programmable Power Supply.
5. F100.TST:VDT (COMPAR.EDT) *(S-3220, S-3250, and S-3270 only)*
[42802-3270] Revised to work with 1151 or 1140A Programmable Power Supply.
6. F172.TST:VDT (DRVIMP.EDT) *(S-3220, S-3250, and S-3270 only)*
[42902-3270] Revised to work with 1151 or 1140A Programmable Power Supply.
7. F290.TST:VDT (AUXPWR.EDT) *(S-3220, S-3250, and S-3270 only)*
[42804-3270] Revised to also test 1151 Programmable Power Supply (as VS5-VS8 replacement).
8. F296.TST:VDT (GPIB.EDT) *(all except S-3275)*
[V02.32] Total error count was incorrect.

C. RECAL SOFTWARE CHANGES

1. C045.TST:RCL (R1151.EDT) *(S-3220, S-3250, and S-3270 only)*
[929000-3270] New test to calibrate 1151 Programmable Power Supply (used in 1140 emulation mode).
2. C055.TST:RCL (CAL81.EDT) *(S-3220, S-3250, and S-3270 only)*
[927700-3270] New test to calibrate 1181 Programmable Current Supply #1 or #2 in 1140 emulation mode.
3. C062.TST:RCL (R1151G.EDT) *(S-3220, S-3250, and S-3270 only)*
[928600-3270] New test to calibrate 1151 Programmable Power Supply with V/I Monitor and GPIB.
4. C070.TST:RCL (DRVCAL.EDT) *(S-3220, S-3250, and S-3270 only)*
[451902-3270] Revised to work with 1151 or 1140A Programmable Power Supply.
5. C100.TST:RCL (CMPCAL.EDT) *(S-3220, S-3250, and S-3270 only)*
[452303-3270] Revised to work with 1151 or 1140A Programmable Power Supply.
6. C130.TST:RCL (DRVADJ.EDT) *(S-3260 only)*
[V02.31] Display incorrect on 4100 or 4200-series terminal.

Software Changes (cont...)

D. Miscellaneous (LIB, MNT, etc.)

1. D370.TST:MNT (HPSSIN.EDT) *(only required on S-3270 with PDP-11/44)*
[465702-3200] Revised for use with PDP-11/44 computer.
2. E050.TST:LIB (TIS2.EDT) *(S-3220, S-3250, and S-3270 only)*
[V01.02] New test to verify 1181 Programmable Current Supply #2.
3. E110.TST:LIB (LOADRD.EDT) *(S-3260 only)*
[V02.23] Compliance voltage not tested on all pins of remote test head.

Notes

These Release Notes cover improvements and corrections made to the Tektest III operating, maintenance, and calibration software during 1987. Unless otherwise noted, these changes affect the Tektronix S-3220, S-3250, S-3260, S-3270, S-3275, and S-3280 Automated Test Systems. Version numbers are associated with each change and are enclosed in square brackets "[...]". The version number of a file can be determined by reading the last two columns of a long-^ form directory listing of a Tektest-III disk.

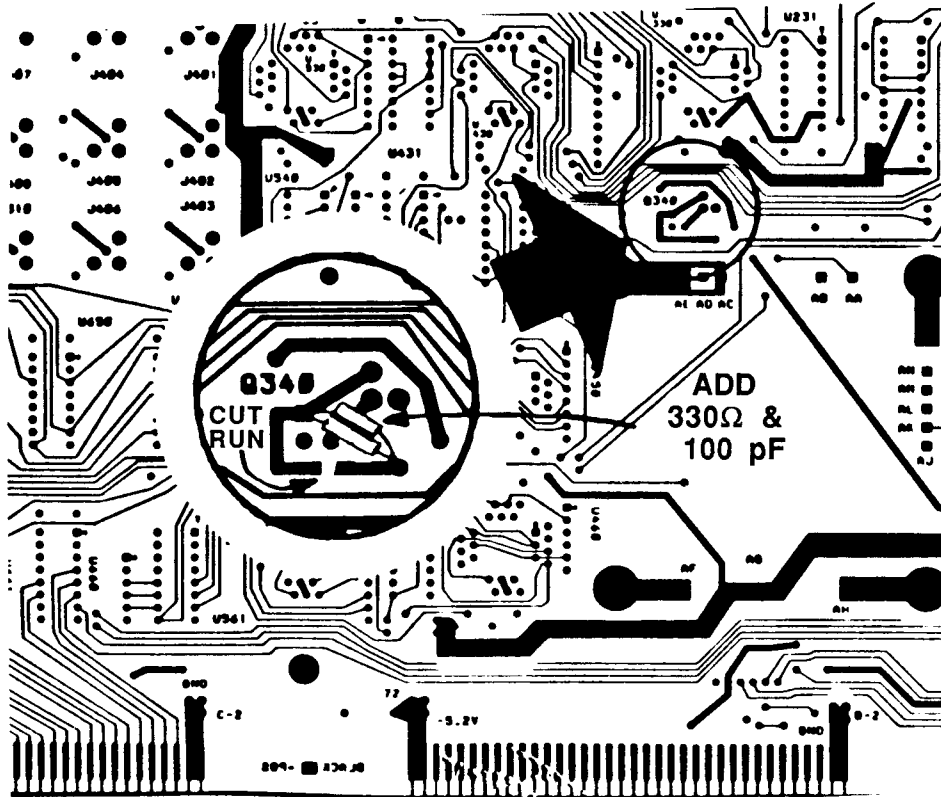


Figure 1 (Opposite Component Side)

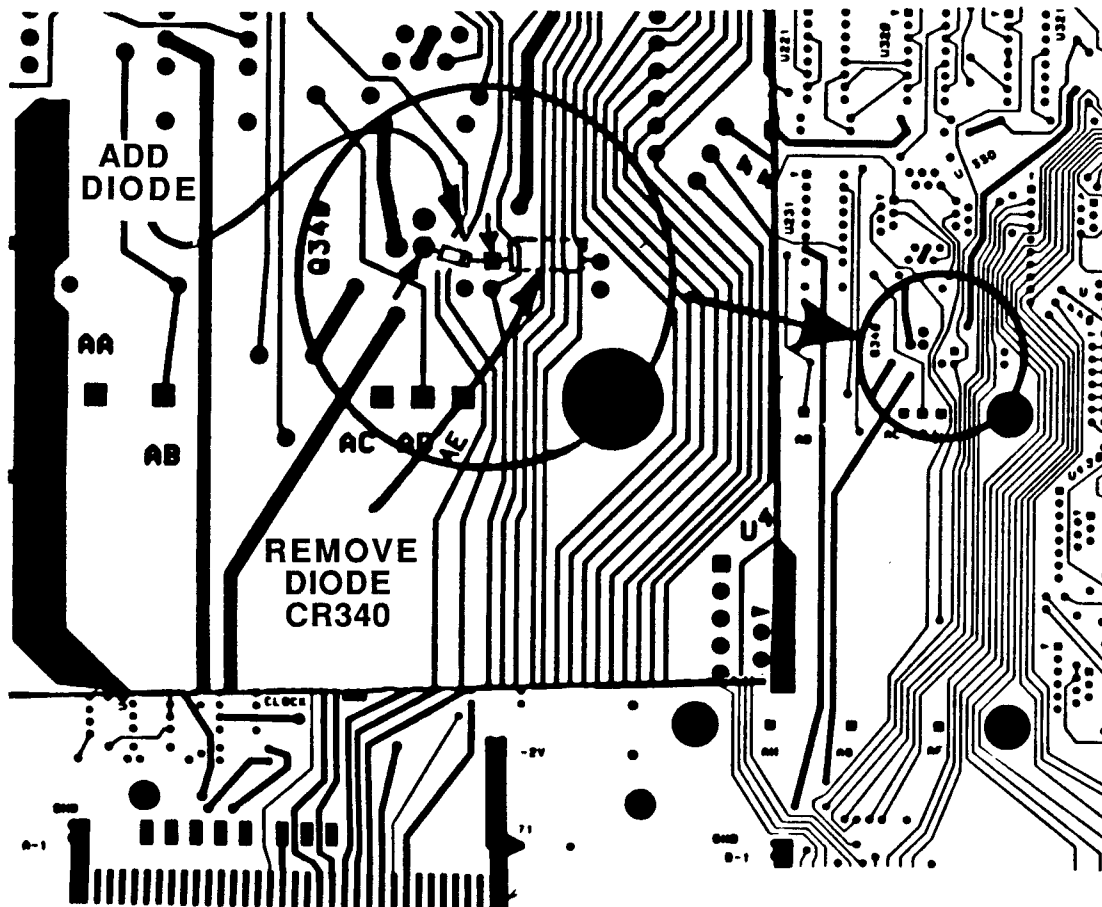


Figure 2 (Component Side)

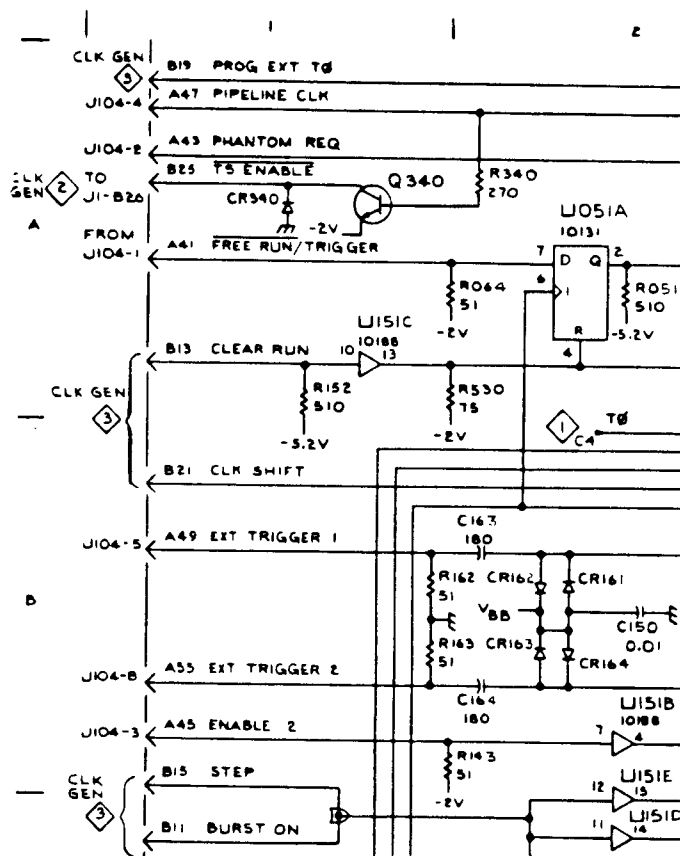


FIGURE 3

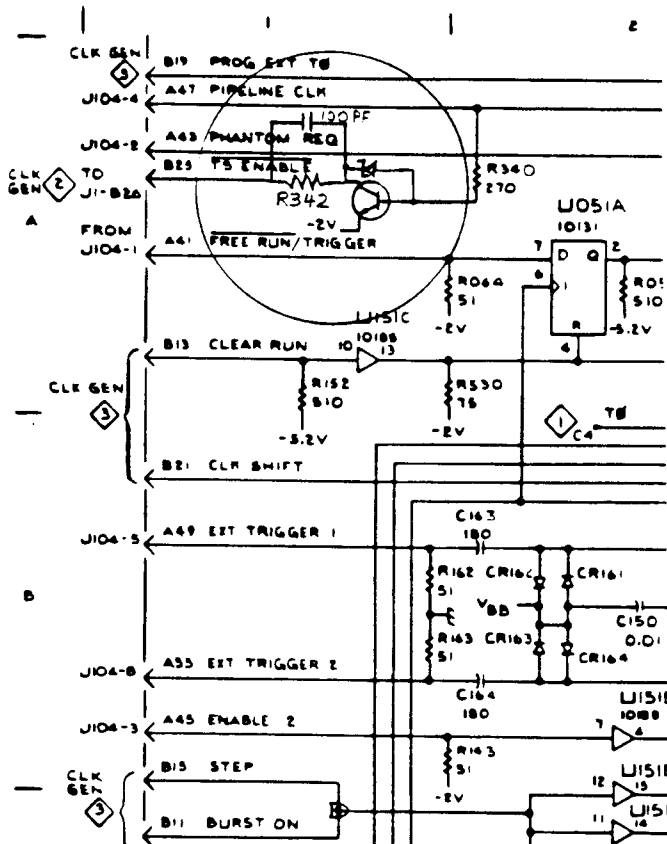


FIGURE 4

USING THE 650HR-C SERIES WITH MII

The three-wire component analog signals from Panasonic's MII tape machines differ slightly from the SMPTE format standard.

MII incorporates a 7.5 IRE black level setup on the luminance (Y) signal whereas the SMPTE format does not. Since the peak white video level is maintained at 700 mV on MII, the black level setup reduces the peak-to-peak voltage of the luminance signal (in comparison to SMPTE). The MII color difference signals are also scaled to the same peak-to-peak voltage as the luminance; i.e. all three signals are lower in amplitude than the SMPTE component standard.

If MII is chosen as the secondary component format by only selecting the MII switch positions (see the following table) and readjusting the three "offset" pots, the result is an internal (to the 650HR-C) GBR signal that is 92.5% of correct amplitude. The resulting light output of the 650HR-C is 83% of the intended level. This reduction in light output is just perceptible if the comparison is made on adjacent monitors. If this light output difference can be tolerated then the monitor can easily be switched between GBR and MII.

Component Format Selection

Component Format	S9004, S9005, S9070 Sections Open	S9004, S9005, S9070 Sections Closed
GBR	All	None
SMPTE	3, 4, 5, 6	1, 2, 7*
BetaCam®	2, 5, 6	1, 3, 4, 7*
M	2, 3	1, 4, 5, 6, 7*
MII	3, 4, 5, 6	1, 2, 7*

*Section 7 of each switch is closed to apply the proper offset for the secondary component format choice.

For installations where switching between the GBR and MII formats is not needed and/or a difference in light output between the Composite

and Component displayed picture can not be tolerated, the calibration procedure which follows is recommended. However, to achieve a calibrated light output from the 650HR-C with an MII format signal, MII must be the secondary component format choice after misadjusting GBR as the primary format selection.

650HR-C / MII CALIBRATION

Overview

Briefly stated, this procedure first adjusts the GBR white levels to be 108% of nominal. Then MII format is selected and the black level offset pots are adjusted to compensate for MII's 7.5 IRE black level setup.

Procedure

1. Ensure that all sections of switches S9004, S9005 and S9070 are open.

2. Connect a color bar signal from the composite test signal generator to the VIDEO INPUT A. Loop the color bar signal through to the CHANNEL 1, 2 and 3 inputs and terminate in 75Ω. Set the color bar signal R-Y and B-Y (or U and V) to Off, setup (or pedestal) to Off and white reference to 100 IRE (or 100%). Set the 650HR-C Series STANDARD switch to COMPONENT. Monitor TP5730 (on A5 OUTPUT AMPLIFIER board) with the test oscilloscope.

3. Use the Volts/Div Variable control to set the black reference pulse-to-white reference pulse distance to six divisions. See Figure C-4.

4. **ADJUST** - R9238 so the color bar white level is six major and 2.5 minor divisions from the 650HR-C Series CHANNEL 1 black reference. See Figure C-4 for the location of the black and white reference pulses.

5. Repeat step 4 (above) monitoring TP5700 (on A5) and adjusting R9208 (white level) for

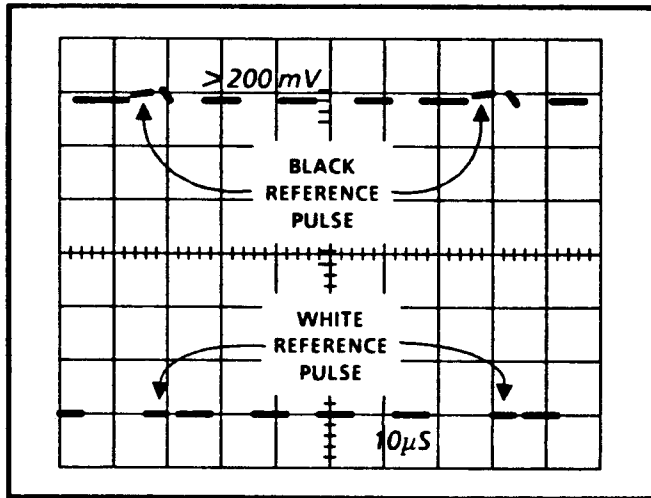


Fig. C-4. Location of 650HR-C black and white reference pulses.

CHANNEL 2, and monitoring TP5760 (on A5) and adjusting R9277 (white level) for CHANNEL 3.

6. Perform step 5 of the Component Input board calibration procedure (page C-6 of the COMPONENT INPUT information insert). Use the Table on the previous page for MII switch settings.

