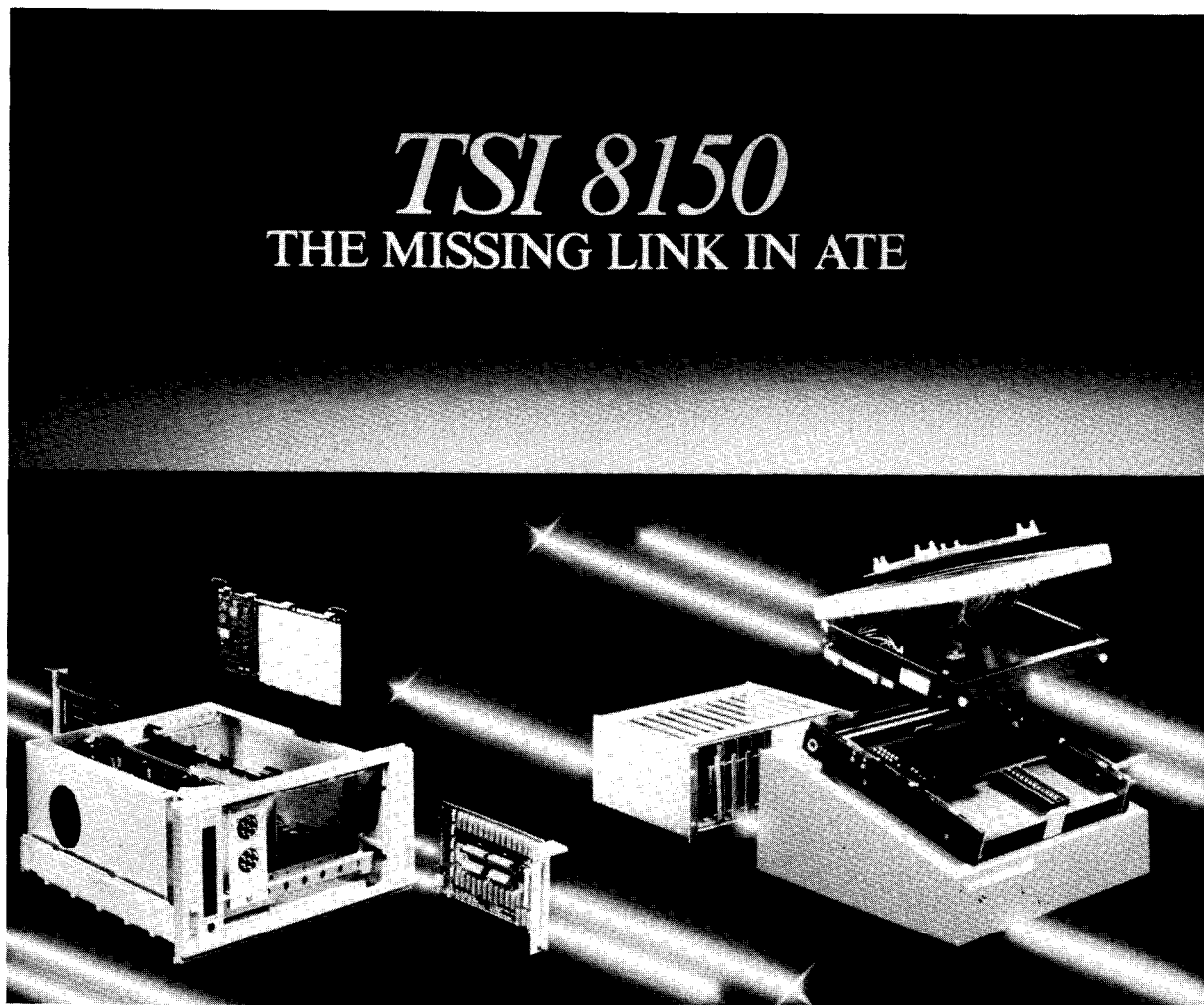


SERVICETEKNOTES

TEKTRONIX—EVER SEARCHING FOR NEW AND BETTER PRODUCTS TO SERVE YOUR NEEDS!



SE504
7A16P

SPECIAL ARTICLE

| | |
|---|-----|
| THE TSI 8150: A SMART SIGNAL ROUTING AND DUT INTERFACING SYSTEM THAT TAKES THE SHAPE YOU NEED..... | AA1 |
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Note: Until all WIZARDS' WORKSHOP articles can be entirely entered into the "desktop publishing" format, inconsistencies will occur with SERVICE TEKNOTES articles not quite matching type face or ink density. These articles are, as you are aware, reprints and "pasteups" from WIZARDS' publications. You will be seeing changes sometime in 1987. (The Editor)

THE TSI 8150: A SMART SIGNAL ROUTING AND DUT INTERFACING SYSTEM THAT TAKES THE SHAPE YOU NEED

Tektronix has designed a family of off-the-shelf components that can be easily and affordably configured to fit a vast majority of signal switching and interfacing needs:

- **Hybrid, board, or component test; cut months off building the missing link in your ATE test system.** Only the most specialized, turnkey ATE systems have ever offered an off-the-shelf solution for interfacing test instruments to the device under test. TSI family members can be easily and affordably configured to fit a vast majority of signal switching and DUT interfacing needs. While the TSI's immediate effect is to dramatically reduce the time and expense of DUT interface design, its most lasting effect is to enhance the reliability and throughput of the test system itself.
- **From DC to 18 GHz; automate up to 500 tests per scanner without signal degradation.** The TSI 8150 contributes as much to improved signal integrity and throughput as it does to convenience and low cost. When installed in the TSI system, each scanner card contains its own intelligent interface, providing real-time control for up to 32 switches in any closure pattern, with storage of up to 500 test sequences. This enables simple, reliable setup of even the most complex tests. The TSA 8140 Test System Adapter closes the DUT interface gap by providing a building block for physical interfacing. The TSI 8150 family gives you an extensive choice of switches and signal routing options covering most signal characteristics. At the same time, a selection of DUT interchangeable test head adapters avoids the time and expense of custom fabrication.
- **In its signal routing capabilities, the TSI 8150 is not just another switcher.** You can configure up to 15 or more smart scanner driver boards, each controlling up to 32 relays. Download and execute up to 500 test steps in real time per each scanner control card, with no GPIB bus traffic during test sequences.
- **Count on Tek Documentation and support to help you fill in the blanks.** The TSI 8150 can take you a lot further down the road to a zero-defects interfacing system, but the final steps still depend on you.

While documentation is commonly one of the weakest links in custom-built systems, Tek has turned it to one of the strongest advantages of the TSI 8150 family. In the best Tek tradition, TSI documentation is clear and comprehensive. Organizations can eliminate the considerable time and cost of documenting all aspects of a custom system by relying on support data that is as dependable and as readily available as the off-the-shelf components themselves.

All components can be ordered individually. With their straightforward interface, TSI switches can be incorporated into existing custom systems, or can be purchased to solve new ATE requirements as the TSI 8150 system evolves.

The TSI 8150 also simplifies service, inventory and parts replacement problems. The modularity and immediate availability of all parts, plus dependable Tek service, let you deal with any problem quickly, without disrupting the routines of your own personnel.

Because Tek is dedicated to keeping parts readily available over the long term for all its products, you can count on a long future for your TSI system.

Just as importantly, you can count on Tektronix to add new capabilities to the TSI 8150 concept in years to come.

As your needs change, the TSI's reconfigurability, wide selection of components and complete documentation bring all the benefits of reduced obsolescence and greater continuity of systems; it is inexpensive enough to pay for itself, in most cases, in the time and labor-savings of its first implementation. It is simply the most cost-effective general-purpose system interface ever developed for systems of 50 to 900 channels.

Let your Tek sales representative tell you more about how the TSI 8150 family can leave your options open, without leaving you alone with a tough, hands-on job.

For more information, contact Tektronix, Inc., P.O. Box 500, Beaverton, OR 97077. Phone: (503) 627-7111; TWX: (910) 467-8708; TLX: 151754. Subsidiaries and distributors worldwide.

MAGNETIC LATCHING RELAY DISASSEMBLY/ CLEANING PROCEDURE

The following procedure should be used when disassembling and cleaning the Tektronix P/N 148-0128-01 magnetic latching relays.

1. Remove relay from instrument.
2. Remove armature (Item #1 in Fig. 1.0) from the relay housing, noting the exact orientation with respect to the relay housing. The armature must be reinstalled in the same orientation as it was prior to removal.
3. Flush inside of relay housing with isopropyl alcohol and swab with non-fibrous brush. Be sure brush is incapable of leaving any fibrous material behind. Flush again and then blow dry with oil-free compressed air.

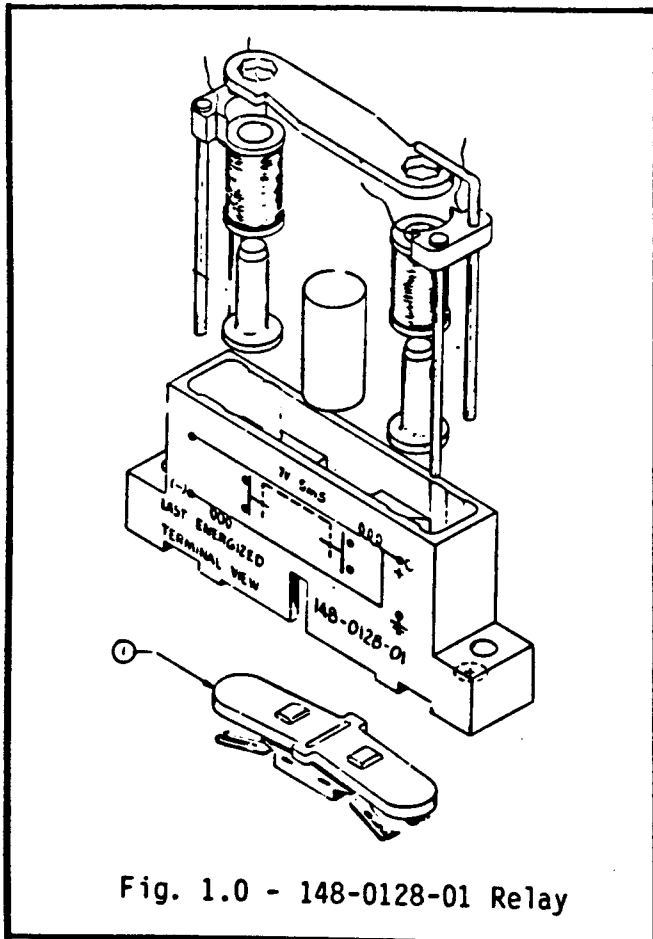


Fig. 1.0 - 148-0128-01 Relay

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4. Clean armature surfaces and contact surfaces with isopropyl alcohol and air dry. Be careful not to damage or bend the delicate gold contact fingers. Proper relay action will be destroyed if contact positioning is altered.
5. Reinstall the relay in the instrument ensuring the correct orientation.
6. The relay should be secured with two screws, Tektronix P/N 213-0848-00 (.40 x .250 size).

W2 Issue 16-21

CUSTOMER SERVICE TRAINING SCHEDULE

Some of our self-service customers may wish to attend Tektronix customer classes before they repair Tektronix products. The schedule appearing on pages 2 and 3 is for our customers. For registration into these classes, contact your local field office or call 1-800-835-6100.

W2 Issue 16-21

RECOMMENDED GPIB CABLES

The AICE (Automated Instrument Compatibility Evaluation) group has indicated that the following list of GPIB cables are high performers in the EMI/RFI testing and recommends their use with GPIB products.

| <u>Tek P/N</u> | <u>Length</u> |
|----------------|---------------|
| 012-0991-00 | 2 meters |
| 012-0991-01 | 1 meter |
| 012-0991-02 | 4 meters |
| 012-1015-00 | 0.5 meter |

W2 Issue 16-23

1987 CUSTOMER SERVICE TRAINING CLASS SCHEDULE

| <u>CLASS TYPE</u> | <u>DEC</u> | <u>JAN</u> | <u>FEB</u> | <u>MAR</u> | <u>APR</u> | <u>MAY</u> | <u>TUITION FEE</u> |
|-----------------------|--------------------------|-------------------|-------------|------------------|-------------------|------------|------------------------|
| 2465 | | 26-2/5 Chicago | | | 27-5 Irvine | | \$1,700 |
| 7912 | | 26-2/5 Bvtn. | | | | | \$2,500 |
| 7612 | | | | | 11-22 Bvtn. | | \$2,500 |
| 465/475 | | 5-9 Boston | | | 27-5/1 D.C. | | \$ 700 |
| 7904/7633 | | 19-30 Denver | | 23-4/3 Boston | 27-5/8 Chicago | | \$1,900 |
| TM5000 DC/DM | Contact Service Training | | | | | | \$2,800 |
| TM500 Cal. Pkg. | 1-5 Denver | | | | | | \$ 700 |
| TV Mon. | 1-12 Bvtn. | | | | | | \$2,100 |
| TV Gen. | | 9-20 Bvtn. | | | | | \$2,300 |
| 1980 | Contact Service Training | | | | | | \$1,200 |
| TM5000 FG/MI | Contact Service Training | | | | | | \$2,400 |
| 4010/4014 | | | 2-6 SCLA | | 27-5/1 Dallas | | \$ 800 |

(continued)

1987 CUSTOMER SERVICE TRAINING CLASS SCHEDULE (continued)

| <u>CLASS TYPE</u> | <u>DEC</u> | <u>JAN</u> | <u>FEB</u> | <u>MAR</u> | <u>APR</u> | <u>MAY</u> | <u>TUITION FEE</u> |
|-----------------------|------------|--------------------------|-----------------|------------|-----------------|---------------|------------------------|
| Ink Jet 469X | | 26-30 Atlanta | | | | | \$ 900 |
| 412X Series | | | 2-13 Atlanta | | 6-17 Chicago | | \$1,900 |
| 1240 | | Contact Service Training | | | | | \$1,900 |
| 85XX MDL | | | | | | 4-22 Bvtn. | \$3,400 |

TV PRODUCTS TRANSISTOR CHANGES

REF: 067-0886-XX INSTRUCTION MANUAL
P/N 070-3530-00

1980 SERVICE MANUAL
P/N 070-2921-00

TDC INSTRUCTION MANUAL
P/N 070-2597-01

TDC OPT. 2, 12 INSTRUCTION
MANUAL, P/N 070-3525-00

TDC 1/2 INSTRUCTION MANUAL
P/N 070-2754-00

TDC 1/2 OPT. 2, 12 INSTRUCTION
MANUAL, P/N 070-3719-00

1450-1 INSTRUCTION MANUAL
P/N 070-5568-00

1450-2 INSTRUCTION MANUAL
P/N 070-2998-00

1450-3 INSTRUCTION MANUAL
P/N 070-3660-00

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

MOD 59352

Due to the increased reliability of parts from our vendors, the following transistors have been changed by mod 59352.

- P/N 151-0309-01 is replaced by P/N 151-0309-00 in the following locations:

1980 - A24A1Q346

- P/N 151-0349-04 is replaced by P/N 151-0349-00 in the following locations:

067-0886-0X - Q95

1450-X - Q95

- P/N 151-0390-01 is replaced by P/N 151-0390-00 in the following locations:

650 Series - A12Q8680

- P/N 151-0405-02 is replaced by P/N 151-0405-00 in the following locations:

1450-X Series - Q65

- P/N 151-0444-03 is replaced by P/N 151-0444-00 in the following locations:

650 Series - A11Q6137

- P/N 151-1005-02 is replaced by P/N 151-1005-00 in the following locations:

1450-X Series - A52Q03

650 Series - A8Q4576, A8Q4578,
A8Q4594, A8Q4598,
A5Q5700, A5Q5702,
A5Q5730, A5Q5732,
A5Q5760, A5Q5762

- P/N 151-1054-02 is replaced by P/N 151-1054-00 in the following locations:

1450-X Series - A56Q55

TDC Series - A7Q23

TDC 1/2 Series - A9Q76

W2 Issue 16-22

AA5001/AA501 LAMPS CAUSE DISTORTION

There are two lamps used for overload protection in the signal input circuit of the AA5001 and AA501. It has been discovered that some lamps can cause excessive distortion readings. This is due to the crimp connection between the tungsten filament and the lamp leads. Since light bulbs are not specified for electrical distortion, the best method to find a usable lamp is via substitution.

If a lamp is suspected, the following procedure can be used to determine its quality:

Apply a signal of about 1 volt to the AA5001/AA501 and allow the unit to autorange to a steady reading. Carefully use a jumper wire and short out the leads of the suspect lamp. If the AA distortion reading improves, the lamp should be replaced.

NOTE:

Be sure to allow the AA to autorange to a stable condition before shorting out the lamp. Failure to do so could cause damage to the input circuitry. After a lamp is replaced, run this procedure again to verify the new lamp.

The affected lamps are:

AA5001: A14DS3050
A14DS3060

AA501: A14DS1520
A14DS1521

W2 Issue 16-23

DM501A MODIFICATION KIT NOW AVAILABLE

REF: M56591

EFFECTIVE S/N: B025410-B054300

Microcircuit, U1601 Tek P/N 156-1306-00, is no longer available and is replaced by Tek P/N 156-2205-00. When replacing this part for this S/N range, use mod kit 050-2040-00. For instruments below this S/N range use mod kit 050-1568-XX.

W2 Issue 16-21

S3295: SOFTWARE CHANGES AND ADDITIONS

Refer to Pullout "A" for recent software changes for the S3295.

W2 16-20

SG504 FRONT PANEL FINE FREQUENCY POT IMPROVEMENT

CHANGE REFERENCE: M60033
EFFECTIVE S/N: B013044

It has been discovered that the metal backplate on the Fine Frequency adjust pot may short to circuitry on the A1 Main circuit board which may cause the -18v supply to short to ground.

To correct this, change R15 to Tek P/N 311-1095-00 and A1R18 to Tek P/N 315-0823-00. The A1 Main circuit board P/N rolls to Tek P/N 670-3403-04.

W2 Issue 16-24

SPG2A OPT. AA/SPG12 OPT. AA
SYNC WIDTH IMPROVEMENTS

REF: SPG2A OPT. AA INSTRUCTION MANUAL
P/N 070-4905-00

SPG12 OPT. AA INSTRUCTION MANUAL
P/N 070-4906-00

Mod 60797

Mod 60797 increases the sync widths from the SCH Phase boards in the SPG2A Opt. AA and SPG12 Opt. AA to insure that specs are easily met.

The changes are made on the SCH Phase board by:

- Adding a diode, P/N 152-0322-00, from the emitter of Q572 to the +3 volt end of R564, with the diode's cathode connected to Q572's emitter.
- Adding a parallel RC network, consisting of C560, a 0.01uF capacitor (P/N 283-0220-00) and R561, a 1K ohm resistor (P/N 315-0102-00) in series with the cathode end of CR560, in a "teepee" configuration.

These changes are suggested as an "as required" addition.

Mod 60797 will be installed in new units from the factory starting with S/N B040886 (1410R Opt. AA) and B023151 (1411 Opt. AA).

W2 Issue 16-20

SPG2A/SPG12/SPG22
SYNC JITTER IMPROVEMENT

REF: SPG2A INSTRUCTION MANUAL
P/N 070-2104-00

SPG12 INSTRUCTION MANUAL
P/N 070-2324-00

SPG22 INSTRUCTION MANUAL
P/N 070-2326-00

Mod 61069

Mod 61069 improves a circuit crosstalk problem associated with the Sync Stripper IC (U700) circuits by changing C690 from 0.1uF to 0.22uF, P/N 283-0339-00.

Install this change on an "as required" basis.

Mod 61069 is being installed in new instruments from the factory with the following starting serial numbers:

| | |
|-------|---------|
| 1410R | B040881 |
| SPG2A | B033552 |

| | |
|-------|---------|
| 1411R | B023139 |
| SPG12 | B022857 |

| | |
|-------|---------|
| 1412R | B020155 |
| SPG22 | B010155 |

W2 Issue 16-20

SPG12 OPT. AA/SPG22 OPT. AA
SCH PHASE IMPROVEMENTS

REF: SGP12 OPT. AA INSTRUCTION MANUAL
P/N 070-4906-00

SPG22 OPT. AA INSTRUCTION MANUAL
P/N 070-4907-00

Mod 60797

Mod 60797 has been implemented in the SPG12 Opt. AA and SPG22 Opt. AA to make the SCH Phase more easily adjustable.

The following changes take place on the SCH Phase board:

- In the SPG12 Opt. AA, pins 3 and 10 of U122 are lifted. Pin 10 is then strapped to ground at adjacent pin 11, and pin 3 is strapped to +5 volts at adjacent pin 4.

(Article Continued on Next Page)

SPG12 OPT. AA/SPG22 OPT. AA SCH
Phase Improvements (continued)

- In the SPG22 Opt. AA, pins 4 and 10 of U122 are lifted and strapped to ground on adjacent pins 3 and 11. Also, jumpers J122, J432 and J429 are moved to their PAL positions.

Install these mods on an "as required" basis.

Mod 60797 is being installed in new instruments from the factory starting with S/N B023151 (1411R Opt. AA) and B020155 (1412R Opt. AA).

W2 Issue 16-20

TSG5/TSG15 MODULATED PULSE
PERFORMANCE IMPROVEMENT

REF: TSG5 INSTRUCTION MANUAL
P/N 070-2336-00

TSG15 INSTRUCTION MANUAL
P/N 070-2479-00

Mod 60712

To improve the phase stability of modulated functions (Pulses and Bars), Mod 60712 adds a diode, P/N 152-0322-00, between the base and collector of Q135, anode to base.

Install the new diode, designated CR135, on an "as required" basis.

Mod 60712 is being installed in new instruments from the factory starting with S/N B012028 (TSG5), and B011716 (TSG15).

W2 Issue 16-20

TSG7 IC SOCKET CHANGE

REF: TSG7 INSTRUCTION MANUAL
P/N 070-3782-00

Mod 61393

For increased reliability, the IC sockets under U172 and U192 have been changed to P/N 136-0752-00. Make this change on an "as required" basis.

Mod 61393 is being installed in new TSG7's from the factory starting with S/N B101561.

W2 Issue 16-23

TSG170A EXCESSIVE
RIPPLE ON TEST SIGNAL OUT

REF: TSG170A Instruction Manual,
P/N 070-5680-00

MOD 60889

Mod 60889 was implemented in the TSG170A to decrease a small amount of bandpass ripple from the Test Signal Out and Option outputs.

The change was made by swapping L555 and L556 on the Analog Board, and L847 and L947 on the option board.

Install Mod 60889 on an as required basis.

Mod 60889 will be installed in new instruments from the factory starting with S/N B030475 (TSG170A) and B030514 (TSG170A Opt. 1).

W2 Issue 16-22

TSG170A SYNC ADVANCE CAUSING SETUP TO
APPEAR ON BLACK BURST OR DELETION OF
AN EQUALIZER PULSE

REF: TSG170A INTERIM INSTRUCTION
MANUAL, P/N 061-3258-00

Mod 62071

Mod 62071 corrects a problem in the TSG170A that occurs during Sync Advance Mode.

The symptoms are:

- Part of a Test Signal can appear on the Black Burst at the end of Line 19.
- One of the equalization pulses on Black Burst will get deleted.

To correct this problem, proceed as follows:

- 1) Sever the ECB run connecting pins 10 and 12 of U780. This can be most easily done near P696 pin 2 on the back of the board.
- 2) Add a wire strap to connect U895 pin 15 and U880 pin 13.
- 3) Add a wire strap to connect U880 pin 12 and U780 pin 12.

Make this change in TSG170A's being serviced where not already done.

Mod 62071 also adds sockets to U880 (P/N 136-0729-00) and U780 (P/N 136-0728-00). These can be added whenever the IC's are replaced due to failure.

Mod 62071 is being added in new instruments from the factory, starting with S/N B030379.

W2 Issue 16-22

TSG170A/SPG170A AMPLITUDE ACCURACY/
RETURN LOSS IMPROVEMENTS

REF: SPG170A INSTRUCTION MANUAL
P/N 070-5965-00

TSG170A INSTRUCTION MANUAL
P/N 070-5680-00

Mod 61696

In order to improve/insure output amplitude accuracies and return loss specs, the following changes have been incorporated by Mod 61696.

- A3R930, A3R943 and A3R958 were changed to 75 ohm 0.25% resistors, P/N 321-0085-03 in the TSG170A.
- A5R922 was changed to a 75 ohm 0.25% resistor, P/N 321-0085-03, in the SPG170A and TSG170A.
- A3R832, A3R833 and A3R834 were changed to 75 ohm 0.25% resistors, P/N 321-0085-03, and A3C844 and A3C847 were changed to 16.8 pf caps, P/N 283-0663-00, in the SPG170A.

Make the above changes on an "as required" basis.

Mod 61696 is being installed in new instruments from the factory starting with S/N B030649 (TSG170A) and B010185 (SPG170A).

W2 Issue 16-24

**TSG170A/SPG170A/TSG300
CABLE VENDOR CHANGE**

REF: TSG170A INTERIM MANUAL,
P/N 061-3258-00

SPG170A INTERIM MANUAL,
P/N 061-3270-00

TSG300 INSTRUCTION MANUAL,
P/N 070-5722-00

Ribbon cable assemblies, P/N 174-0034-00, that are used in the TSG170A, SPG 170A and TSG300 have been changed to a new vendor for reliability concerns.

If you have one of the cables that appears intermittent, seems to have come loose for no reason, or is connected to a failure in some other way, look at the end connector housing colors.

If the housing is blue, give strong consideration to ordering a new cable for replacement. A new P/N 174-0034-00, from the approved vendor, should have grey connector housings.

W2 Issue 16-21

TSG170A/SPG170A/TSG300 HARDWARE CHANGE

REF: TSG170A INSTRUCTION MANUAL
P/N 070-5680-00

SPG170A INSTRUCTION MANUAL
P/N 070-5965-00

TSG300 INSTRUCTION MANUAL
P/N 070-5722-00

Mod 61563

The four screws holding the power supply safety shield and the circuit board to the chassis bottom have been lengthened to compensate for tolerance problems.

The new screws being used now are P/N 211-0244-00.

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Install Mod 61563 on an as required basis.

Mod 61563 is being installed in new instruments from the factory starting with S/N B030623 (TSG170A), B010181 (SPG170A), and B010118 (TSG300).

W2 Issue 16-21

7A16P OPERATING PRECAUTION

REF: 7A16P INSTRUCTION MANUAL, TEK
P/N 070-2308-00

It is recommended you do not install these plug-ins or any others into powered up mainframes. The damage that will result in the 7A16P is that A30U810 will be destroyed.

W2 Issue 16-21

**49X/P, 275X/P: METHOD FOR
NOISE SIDEBAND VERIFICATION**

The term "Noise Sideband" has the following definition when describing spectrum analyzer performance characteristics:

"An undesired response caused by noise internal to the spectrum analyzer appearing on the display around a desired response."

The noise sideband definition includes displayed sidebands around an input signal, and noise pedestals (phase noise) on the skirts of a displayed signal. Noise sideband performance verification for 49X/P and 275X/P products is usually completed at a 100MHz Center Frequency setting using the Calibrator signal. This verification method is adequate for noise sideband testing, unless noise sideband problems have been reported at other Center Frequency settings. Occasionally, instrument failures may occur which generate noise sidebands at various Center Frequency settings, but

49X/P, 275X/P: Noise Sideband Verification (continued)

performance at 100MHz is within the specified tolerances. In these cases, performance testing must be completed at the Center Frequency settings where noise sidebands have been reported.

Noise sideband performance verification requires a stable R.F. source capable of providing power levels up to 75dB above the instrument noise floor. The 1st L.O. Output signal from 49X and 275X spectrum analyzers provides a convenient signal source for testing noise sideband performance at any Center Frequency setting between 2GHz and 21GHz. The fundamental frequency range of the 1st L.O. (2GHz to 6GHz) will provide signal levels greater than +7.5dBm. Harmonics of the fundamental are also present at the 1st L.O. Output port, but power levels will be reduced. The 1st L.O. signal must be phase locked when used for this application.

First L.O. Output signals may be required for noise sideband testing at a specific Center Frequency setting. The test spectrum analyzer Center Frequency can be set to a point which provides the desired L.O. frequency or harmonic. The appropriate test spectrum analyzer Center Frequency setting may be determined (Frequency Band 4 must be selected) using the following formula:

$$\text{C.F. Setting} = (3F/N) - .829\text{GHz}$$

N = L.O. Harmonic Required

F = Desired 1st L.O. Output Frequency in GHz

For example, a 10GHz 1st L.O. Output signal may be obtained using the 2nd harmonic of the 1st L.O. frequency by setting the test spectrum analyzer

Center Frequency to 14.171GHz on Band 4. The actual 1st L.O. Output frequency will be within a few Megahertz of the desired frequency.

W2 Issue 16-24

140/144/146 ABERRATIONS ON WHITE BAR

REF: 140 INSTRUCTION MANUAL
P/N 070-0944-00

144 INSTRUCTION MANUAL
P/N 070-1084-00

146 INSTRUCTION MANUAL
P/N 070-1111-00

For those instances where aberrations or ripple on the white bar portion of a Color Bar signal are the sources of complaint, try changing C496.

C496, P/N 290-0309-00, can be found on Schematic 4b, the Bar Drive and Video Output circuit board.

W2 Issue 16-24

275X/P: LONGER SCREWS FOR ATTACHING CABINET FEET

REF: 2755/P SERVICE VOLUME 2
P/N 070-6033-00

Fig. 1, Index No. 3

M61879

FDI Manufacturing is now using a longer screw (P/N 211-0514-00, .750 inches) for attaching the 275X/P cabinet feet. Some 275X/P products with serial numbers below B010150, may have been assembled using .625 inch screws (P/N 211-0513-00) for attaching the cabinet feet.

(Article Continued on Next Page)

275X/P: Longer Screws (continued)

However, it has been determined that using the shorter screws may cause the threaded portion of the lower frame rails to strip during cabinet installation. Use of the longer P/N 211-0514-00 screw is recommended to insure that a sufficient number of threads will mate with the lower frame rail, reducing the risk of stripping the frame rails during cabinet installation.

W2 Issue 16-21

**650 SERIES PINCUSHIONING
WITH MAXIMUM H SIZE**

REF: 650A INSTRUCTION MANUAL
P/N 070-2234-00

650HR INSTRUCTION MANUAL
P/N 070-2646-02

If you notice a tendency for the display to pincushion with maximum H Size adjustment, there are two possible solutions.

1. Change Q4090, OR
2. Select R4779 for a value that will produce 75-80 volts at Q4770's emitter. This can be most easily done by paralleling R4779 with another resistor on the back of the Deflection Heat Sink board.

In some instances, a voltage at Q4770 of 72-73 volts has been increased adequately by using a 750 ohm 3 Watt Resistor, P/N 308-0552-00.

W2 Issue 16-22

**690SR/6942 DEGAUSS SWITCH SPRING
CHANGE**

REF: 690SR INSTRUCTION MANUAL
P/N 070-2870-00

Mod 58707

Mod 58707 changes a spring in the De-gauss Switch linkage to provide increased spring tension. The linkage now has more positive action.

The spring being changed is Item 5-78; illustrated in exploded view Figure 5.

Replace the spring with P/N 214-2655-00 on an as required basis.

W2 Issue 16-20

760 CAL PROCEDURE CHANGE

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

Listed below is a Calibration Procedure change for the 760 Stereo Audio Monitor. The affected page in the manual is 5-6.

1. Preliminary Set Up****** NOTE ******

Unless otherwise stated, always use a 775mV rms, 1 kHz sinewave as the audio input.

- a. Set the display orientation to X-Y (on A3 Main board, J273 & J373 to pins 1 & 2), Input Sensitivity to 0 dB (A3, J185, J385, J657) and Input Termination to Inf (A3, J192, J392, J664). Use the Sound Stage graticule even through the X-Y display orientation is in use.

W2 Issue 16-20

760 ZENER DIODE FAILURES
AND -12 VOLT OSCILLATIONS

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

Mod 61789

Mod 61789 has been incorporated in the 760 to address two problems:

- Failure of VR119 after a high voltage arc.
- Some oscillations on -12 volt supplies.

The first problem was addressed by replacing VR119 with E119, a gas-filled surge arrester, P/N 119-0181-00. NOTE: E119 must be installed about 1/4" off of the circuit board and must be dressed to lean toward the center of the board, away from any metal chassis parts.

The second problem was addressed by changing A3C225 to a 1 ufd capacitor, P/N 290-0267-00.

Both changes are "recommended" for any 760 returned for routine service.

Mod 61789 is being installed in new instruments from the factory starting with S/N B010276.

W2 Issue 16-24

1480 SERIES MOD W5F
CAL PROCEDURE CHANGES

REF: 1480 SERIES MOD INSTRUCTION
MANUAL, P/N 070-5844-00

Enclosed as pull-out supplement "B" are changes to the 1480 Series Mod W5F Adjustment procedures.

W2 Issue 16-23

1710B SERIES/1720 SERIES/1730 SERIES/
WFM300/760 POWER SUPPLY INTERCONNECT
CABLE TIE-DOWN

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 070-4474-00

WFM300 SERIES INSTRUCTION MANUAL
P/N 070-6039-00

760 SERIES INSTRUCTION MANUAL
P/N 070-5992-00

In order to alleviate problems associated with the Power Supply Interconnect Cables catching on the instrument's cabinet, a nylon tie-down is being added to P546.

The interconnect cable, once connected to J546, can be folded back against the connector housing (P546), and the tie-down (P/N 346-0120-00) can be wrapped around the plug/cable combination.

Install a tie-down on any of the above instruments that are returned for service where not already done.

W2 Issue 16-22

1720 SERIES CAL PROCEDURE CHANGE

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

The following text addition to calibration Step 15, addresses calibration of line select focus, without a companion 1730.

- a. Connect the output of the Function Generator to pin 7 of the 1720-Series rear-panel AUXILIARY connector.

(Article Continued on Next Page)

1720 Series Cal Procedure Change (continued)

- b. Set the Function Generator for a narrow, negative going, 10V, 1kHz pulse.
- c. Connect the color bars output from the television test signal generator to the 1720-Series and terminate in 75 Ohms.
- d. Set the 1720-Series for VECT and adjust INTENS and FOCUS for the best display.
- e. Push the 1720-Series AUXILIARY button.
- f. Adjust R244 (LS Focus) for the best 1720-Series display.

W2 Issue 16-20

1730/1731 CHROMA FILTER ADJUSTMENT

REF: 1730 SERIES INSTRUCTION MANUAL
P/N 070-4474-00

Mod 62004

Mod 62004 has been implemented in the 1730 and 1731 to make adjustment of the chroma filter easier to accomplish.

A3C779 is changed to a 70pfd capacitor, P/N 283-0647-00.

Install this change on an as required basis.

Mod 62004 is being installed in new instruments from the factory starting with S/N B011103 (1730) and B010438 (1731).

W2 Issue 16-20

1730 SERIES IMPROVEMENT MODIFICATIONS

REF: 1730 SERIES INSTRUCTION MANUAL
P/N 070-4474-00

Mod 60585

The 1730 Series has been changed to address the following problems.

- 1) Performance improvements of the Video Output Circuitry.
- 2) Parts added "teepee" style need to be put down on the board.
- 3) Improved adjustment of the 4.43MHz Chroma Filter.

Item's 1 and 2 were achieved by redesigning the circuit board and changing a few parts. These changes are only Field Installable by ordering a new Main Board (A3).

Item 3 was addressed by changing A3C780 to a 70pf capacitor, P/N 283-0647-00, and can be installed on an "as required" basis.

Mod 60585 is being installed in new instruments from the factory starting with S/N B010605 (1730), and B010223 (1731).

W2 Issue 16-23

1740 SERIES V AXIS DEMODULATION ACCURACY

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

Mod 55853

In order to insure proper V axis demodulation for the 1740's Vector Display, the Demodulator board had several parts changes, and the circuit patterns were redesigned.

(Article Continued on Next Page)

1740 Series V Axis Demodulation Accuracy (continued)

For those instances where a 1740 customer must have accurate Vector displays with regard to the +V Axis, the entire board must be replaced with the current version. Just changing the components won't do the job completely.

Enclosed as pull-out supplement "C" is the manual insert that covers Mod 55853.

This change is being installed in new instruments from the factory starting with S/N B013494 (1740), S/N B011225 (1741) and S/N B010154 (1742).

W2 Issue 16-22

2213A/2215A/2220/2230/2235/2236 TOOL AVAILABLE FOR REMOVING ATTENUATOR ASSEMBLY

Removing an attenuator assembly from a 2200 Series instruments requires inserting a T9 torx-head driver between the front panel chassis and front panel board to remove two screws which secure the attenuator board to the front bracket. Often this results in stripped screws because of the limited space and angle of drive.

A longer-length (2.75 inch) T9 torx-head driver is used by the manufacturing line for this purpose and is now available as Tektronix P/N 003-1398-00.

W2 Issue 16-20

2754/P, 2755/P: CRT IS P/N 154-0910-00

REF: 2754/P SERVICE VOLUME 2
P/N 070-6098-00

2755/P SERVICE VOLUME 2
P/N 070-6033-00

The 275X/P CRT (V100) part number has been listed incorrectly in the 275X/P Service Volume 2 manuals as P/N 154-0809-00. The CRT actually used in 275X/P products is a P/N 154-0910-00. Please note this correction in your 275X/P Service Volume 2 Manuals for future reference.

Electrically, the P/N 154-0809-00 (used in 49X products) and P/N 154-0910-00 CRTs are identical. However, 275X/P products require a longer trace rotation coil cable on the CRT to compensate for the increased distance between the CRT and Z-Axis circuit board assembly.

W2 Issue 16-23

S3200/1800 FLOATING POWER SUPPLY

REF: 1804B Test Station, Volume 2
P/N 070-3331-02

1804V Test Station, Addendum to
1804V Test Station, Volume 2
P/N 061-2867-00

1805 Test Station, Volume 2
P/N 070-3338-00

1807 Test Station, Volume 2
P/N 070-4134-00

1809V Test Station, Volume 2
P/N 061-2849-00

When ordering a replacement 5V Power Supply module (P/N 119-0439-01) used with Floating Power Supply Assemblies 670-2554-05 (1804B, 1805, and 1807 Test Stations) and 670-8002-00 (1804V and 1809V Test Stations) use Parts Replacement Kit 050-2104-00

(Article Continued on Next Page)

S3200/1800 Floating Power Supply (continued)

A change of size to the power supply necessitated the kit since a shorter screw is required to attach the supply to the circuit board.

The shield that covers the 5V supply is no longer needed nor does it fit the new supply, so when installing the parts replacement kit, just toss the shield and mounting nuts away.

W2 Issue 16-22

4041 DISK DRIVE ERROR CODES

The error codes sent to the 4041 by the 4041DDU, 4925, or 4926 are not easily interpreted. Also, the meaning of each error code will vary, depending on the disk unit used. Below is a list of error codes and their meaning. Note that each error will give one of two error codes, depending on whether the Address Valid bit is set. For troubleshooting, the condition of the Address Valid bit is unimportant.

4041 DDU

Drive Errors

| | |
|-----------|---|
| 1240 1368 | No error status. |
| 1241 1369 | No index signal. |
| 1242 1370 | No seek complete. |
| 1243 1371 | Write fault. |
| 1244 1372 | Drive not ready. |
| 1245 1373 | Drive not selected. |
| 1246 1374 | No track 00. |
| 1247 1375 | Multiple Winchester drives selected. |
| 1249 1377 | Media change. This status indicates that the removable media was changed since the last command was issued to the requested unit. This status will be reported the first time a command which |

reads or writes on the media is issued after the media change. The requested command will not be performed. This condition is cleared for the next I/O.

1253 1381 Seek in progress.

Controller Errors

| | |
|-----------|--|
| 1256 1384 | ID read error. (ECC error in the ID field). |
| 1257 1385 | Uncorrectable data error during a read. |
| 1258 1386 | ID address mark not found. |
| 1260 1388 | Record not found. (found correct cylinder and head but not sector). |
| 1261 1389 | Seek error. (R/W head positioned on a wrong cylinder and/or selected on wrong head). |
| 1263 1391 | Write protected. |
| 1264 1392 | Correctable data field error. |
| 1265 1393 | Bad block found. |
| 1266 1394 | Format error. (The controller detected during a check track command that the format on the drive was not as expected). |
| 1268 1396 | Unable to read an alternate track address. |
| 1270 1398 | Attempted to directly access an alternate track. |
| 1271 1399 | Sequence time out during disk or host transfer. |

Command Errors

| | |
|-----------|--|
| 1272 1400 | Invalid command received from the host. |
| 1273 1401 | Illegal disk address. (Address beyond the max. address). |
| 1274 1402 | Illegal function for the type of drive specified. |

4041 Disk Drive Error Codes (continued)

1275 1403 Volume overflow. (Maximum sector address was exceeded during a multiple sector read or write).

Misc. Errors

1288 1416 RAM error.

4925

1240 1368 No error.
 1242 1370 No seek complete.
 1243 1371 Write fault. (FDD fault).
 1244 1372 Drive not ready.
 1245 1373 Drive not selected.
 1246 1374 No track 0.
 1247 1375 Illegal or multiple drives selected.
 1250 1378 Insufficient capacity.
 1256 1384 I.D. CRC error.
 1257 1385 Data CRC error.
 1258 1386 I.D. address mark not found.
 1259 1387 Data address mark not found.
 1260 1388 Record not found. (Bad cylinder).
 1261 1389 Seek error. (Wrong cylinder).
 1262 1390 DMA timeout. (FDC overrun).
 1263 1391 Write protected.
 1265 1393 Bad block found.
 1272 1400 Invalid command.
 1274 1402 System error.
 1275 1403 Power fail.
 1288 1416 RAM diagnostic failure.
 1289 1417 Program memory checksum error.

4926

1240 1368 No error detected.
 1241 1369 No index detected.
 1242 1370 No seek complete.
 1243 1371 Write fault.
 1244 1372 Drive not ready after it was selected.

1246 1374 Track 00 not found.
 1256 1384 ID field read error.
 1257 1385 Uncorrectable data error.
 1258 1386 Address mark not found.
 1260 1388 Target sector not found.
 1261 1389 Seek error.
 1264 1392 Correctable data error.
 1265 1393 Bad track flag detected.
 1266 1394 Format error.
 1268 1396 Illegal (direct) access to an alternate track,
 1269 1397 Format alternate track command to illegal track.
 1270 1398 Attempted to access and alternate track not flagged as alternate.
 1271 1399 Format alternate track command to the original bad track.
 1272 1400 Invalid command.
 1273 1401 Illegal disk.
 1288 1416 RAM diagnostic failure.
 1289 1417 Program memory checksum error.
 1290 1418 ECC diagnostic failure.

W2 Issue 16-24

4041 SYS ERR OC, 10,2C CORRECTION

Ref: Mod 62330
 SN B071905
 670-9298-XX

It has been discovered that some 4041s utilizing the CPU board with on-board memory occasionally generate a Sys Err OC, Sys Err 10 or Sys Err 2C error message. This has been traced to insufficient power supply decoupling of the CPU DRAM chip, A2U3061. The cure is to solder a .47 ufd capacitor, C3062, Tektronix part number 283-0203-00, directly to the leads on pins 11 and 31 of A2U3061. The capacitor must be located across the top of the chip,

(Article Continued on Next Page)

4041 SYS ERR OC, 10,2C Correction (Continued)

with the leads kept as short as possible. The capacitor is ineffective if soldered to the foil side of the board. This modification will be installed in all 4041s manufactured after serial number B071905.

W2 Issue 16-23

4696: 110/220V CONVERSION

Ref: 4696 Service Mnl, 070-5851-00

Line voltage conversion for the 4696 is not as simple as moving a jumper and changing the line fuse. Unique parts are required for each line voltage, as follows:

110V Components

| | |
|--------------------|-------------|
| L.V. Transformer | 118-4936-00 |
| Power Supply Board | 118-4932-00 |
| U.S. Power Cord | 161-0066-00 |

220V Components

| | |
|----------------------|-------------|
| L.V. Transformer | 118-4937-00 |
| Power Supply Board | 118-5022-00 |
| Power Cord, A1, Euro | 161-0066-09 |
| Power Cord, A2, U.K. | 161-0066-10 |
| Power Cord, A3, Aust | 161-0066-11 |
| Power Cord, A4, US | 161-0066-12 |
| Power Cord, A5, Swis | 161-0154-00 |

These items may be costly to our customers, especially when exported. Please use any available opportunity to advise salesmen and OEM customers to order the line voltage option with the product.

W2 Issue 16-24

S3295: SOFTWARE CHANGES AND ADDITIONS

Listed are the recently approved software changes and additions for TEKTEST V version II.

DOCLI.MAC Version V02.00 This subroutine allows a command to be passed from TEKTEST to the user's command line interpreter (CLI). It also allows TEKTEST program to move files and other operating system functions from within a TEKTEST program.

LOGFIL.MAC Version V02.02 Added a test in RCORDX to detect when file is at byte position zero and reset previous "RSTOP" retained by RCORDX subroutines to zero.

CONASM.TEK [3,10] Version V02.01 Changed the program to recognize the statements (\$NORMAL RUNSEQ) and (\$SHORT RUNSEQ) as well as (\$RUNSEQ).

TSTSRT.TEK [3,10] Version V02.01 Changed the program to ask the user: NORMAL or SHORT VERDICT SEQUENCE?

GPIBV2.MAC Version V02.01 GPIBMD subroutine was added to GPIBV2.MAC.

PPASM1.TSK Version V05.12 PPASM generated incorrect code when the statements in a repeat loop were terminated with a comma. PPASM now flags this condition as a syntax error.

PPASM2.TSK Version V05.18 Same as PPASM1.

CSKADJ.TSK [3,20] Version V02.03 Added code to test for a divide by zero condition for TIM1, TIM2, TIM3, and TIM4.

CSKADJ.TEK [3,20] Version V02.04 Program was setting HIDRIVE to a negative value. Changed code defining "HIDRIVE = -1.3V" to "LODRIVE = -1.3V".

HNDLR1.MAC Version V02.01 Added code to set a flag when the start is from the interface and then clear the interface to eliminate any later confusion.

IOFLSH.MAC Version V02.01 Program was changed to correctly set the EOF marker, and prevent the A3 error when running F990.

SLWCHK.TEK [3,10] Version V02.02 Modified part 100 to read "IF(ADVANCE)" instead of "IF(NOT ADVANCE)", to fix the LOOP ON PASS/Fail register options.

MUXMOD.TEK [3,10] Version V02.01 Added section in part 11 to change even TSTPIN to odd, to prevent showing erroneous failures on the adjacent pin when one pin is selected by the switch register option.

FCRCAL.TEK [3,20] Version V02.01 Changed section 21 to instruct the user to connect the DVM to a ground pin on the

I/O port of the pin card.

MDH.TSK [1,54] Version V02.03 To correct the 64 error when attempting to loop on the full VERDICT sequence, the search algorithm, the memory management, and the module size was changed.

ORING.TEK [3,10] Version V02.01 Enhanced to check the ORING function and the MASKING function together.

TCM.TSK [1,54] Version V02.03 The 1140 power supplies are now set to zero before exiting from odd address locations.

CONFIG1.TEK and CONFIG2.TEK [3,1] Version V02.00
TSTSRT.TEK and CONASM.TEK now look for a program called CONFIG1.TEK and .BIN for normal VERDICT runs, and CONFIG2.TEK and .BIN for short VERDICT runs.

SLWADJ.TEK [3,20] Version V02.01 Modified program to look for SKW000.IRY on LB:[1,1]. Changed code defining "HIDRIVE = -1.3V" to "LODRIVE = -1.3V".

CAL568.TEK [3,20] Version V02.01 To repair steps 1 and 3 which did not work, load PP memory location 2 and 3. The pattern now jumps between locations 2 and 3.

BLDTEK.CMD [1,54] Version V02.03 Changed entries in BLDTEK.CMD to build F060, F150, and F240 by overlaid method. This prevents abort with CB error.

RTRTNTBL1.MAC Version V02.03 Modified build command files to improve TCM.

RTLIBBLD.CMD Version V02.02 Modified build command files to improve TCM.

USRLIBBLD.CMD Version V02.01 Modified build command files to improve TCM.

TCMBLDAUT.MAC Version V02.02 Modified build command files to improve TCM.

MDH.TSK [1,54] Version V02.04 Both TCM and Run-time now initialize MDH any time MDH returns a fatal error condition. Changed crash error code to 63 rather than 62. Eliminated a synchronization problem by changing the intertask communication of MDH to TEKTEST.

TCM.TSK [1,54] Version V02.04 When the user attempts to do a PPLOAD or LOAD LOCAL MEMORY with a missing or incorrect file, MDH maintains in its filename directory the reference to the incorrect file. The solution is the same as MDH.TSK; initialize MDH.

PATPROC.C Version V02.01 Same as MDH.TSK and TCM.TSK

ABRT.MAC Version V01.0 Same as MDH.TSK and TCM.TSK

LMEM.C Version V02.01 Same as MDH.TSK and TCM.TSK

GBLDAT.MAC Version V02.01 Same as MDH.TSK and TCM.TSK

EXIT.MAC Version V02.04 Same as MDH.TSK and TCM.TSK

CLOK10.TEK [3,10] Version V02.00 A new VERDICT program that verifies the operation of the S3295 clock generator using the system S-STMS.

F8500.TEK [3,50] Version V02.00 S3295 Fluke 8500A and 8502A functional verification test.

CLOCK9.TEK [3,10] Version V02.02 Changed in part 99 in order to add CLOK10.

TCM.ODL Version V02.04 LRESET produces incorrect results in overlayed programs. Changed the overlay descriptions for TEKTEST datalogging routines.

HW.ODL Version V02.05 Same as TCM.ODL

NDHW.ODL Version V02.03 Same as TCM.ODL

VDT.ODL Version V02.04 Same as TCM.ODL

FAZCAL.TEK [3,20] Version V02.00 Changed the verification limits in part 103 to allow the test to pass more easily while still ensuring that the system timing will meet specifications.

LMEM.C Version V02.02 Modified the intertask communication between runtime module and the mass data handler.

TCM.TSK [1,54] Version V02.05 The erase command now deletes label names from the symbol table. Two internal pointers were initialized so that adding a label will not hinder variable initialization.

FSEEK.MAC Version V02.01 The LRESET did not work correctly for one block files. Changed program to correctly evaluate the EOF status when positioning the file pointer within the same block.

TCM.TSK Version V02.06 Changed to allow initializing hardware when in TCM with the RETRAN flag set.

FAZCAL.TEK [3,20] Version V02.03 Added the extension (;1), after CALDAT.IRY in FAZCAL.TEK.

TSTSRT.TEK [3,10] Version V02.02 Program now has the capability to print out the pin card version table.

BUFADJ.TEK [3,20] Version V02.01 The program instructs the user to check for abberations in the verification steps but

gives no specs. Specs. were added based on the test specs. for calibration.

DSKADJ.TEK [3,20] Version V02.01 A warning has been added which prints out when the program is run, that the DESKEW registers have been corrupted. An "IF ADVANCE" statement has been added to the graph plotting routine. Phase width programming has been changed from 24NS to 36NS.

BLDTEK.CMD Version V02.04 CF1CAL and CF1TST were being built to the wrong task names. The task file names in the build reference section were changed.

DESCRIPTION**ADJUSTMENT PROCEDURE****CHANGE TO READ:****3. SET CALIBRATOR ACCURACY AND VERTICAL GAIN**

- e. **ADJUST** – Front-Panel screwdriver adjust GAIN for a display amplitude of 140 IRE \pm 1 IRE for NTSC (1.00 V \pm 7 mV for PAL).

Fig. 3-3 Change as shown.

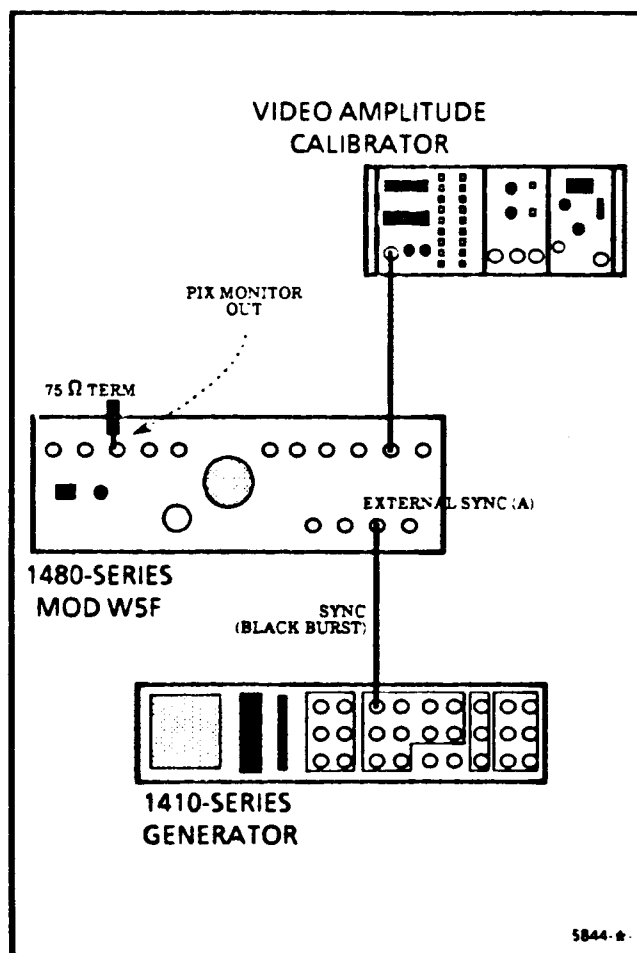


Fig. 3-3. Equipment connections required to adjust Vertical Gain and Calibrator Amplitude.

Date: 11-1186

Group Code 24

Change Reference: C1/1186

Product: 1480-Series MOD W5F

Manual Part No: 070-5844-00

CHANGE TO READ:

6. ADJUST OFF SCREEN RECOVERY

- a. Connect a *T/2 pulse and bar signal* from the Television Signal Generator and the VAC to the 1480-Series VIDEO INPUT A, as shown in Fig. 3-6.

Change Fig. 3-6 as shown.

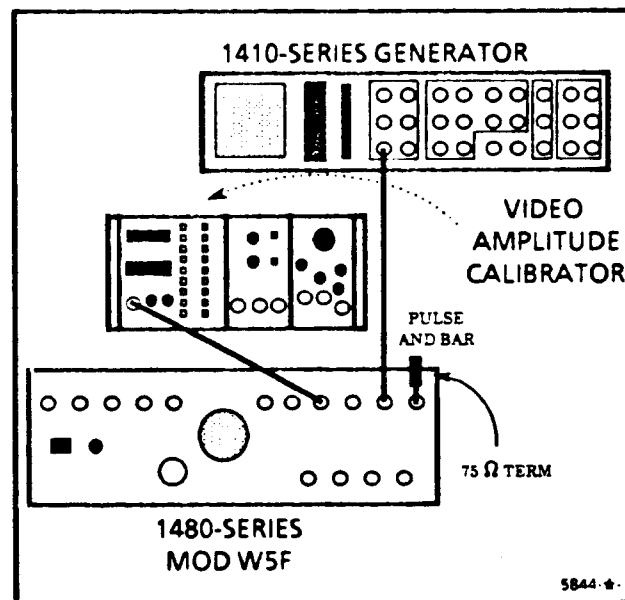


Fig. 3-6. Connecting the *T/2 pulse and bar signal* to adjust Off Screen Recovery.

Date: 11-11-86

Group Code 24

Change Reference: C1/1186

Product: 1480-Series MOD W5F

Manual Part No: 070-5844-00

CHANGE TO READ:

8. CHECK CHROMA OVERDRIVE RECOVERY

- g. Set the VAC amplitude for a reading 2 mV less than that noted in part d of this step. If the display separation is greater than that noted in part f. repeat steps 2 and 6.

10. ADJUST A AND B INPUT RESPONSE

- 1. Repeat steps *e through k* until both C1056 and C1244 are right on.

Table 3-2 and Table 3-3.

DELETE:

* 50 IRE at 0.5 V Full Scale (350 mV) = blanking level to white level, 100 IRE (700 mV), on the graticule. 20 IRE at 0.2 V Full Scale (140 mV) = blanking level to white level, 100 IRE (700 mV), on the graticule.

CHANGE TO READ:

16. ADJUST LOW PASS FILTER

- C. ADJUST -- L1374, L1385, and L1395 (Low Pass Filter) for 0.5% or less overshoot or ringing on the corner of the calibrator square wave leading edge.

19. ADJUST 4.43 MHZ BANDPASS FILTER (1481 OR 1485)

- d. ADJUST -- L1172, L1191, and C1182 (4.43 Filter) for a red bar amplitude of 1.0 V, flat bar top, and color burst rise and fall times that are nearly identical.

Tektronix

COMMITTED TO EXCELLENCE

MANUAL CHANGE INFORMATIONDate: 10-14-86Change Reference: M55853

Group Code 24

Product: SEE LISTManual Part No: 070-4473-00**DESCRIPTION**

1740 EFF SN B013494
1741 EFF SN B011225
1742 EFF SN B010154

ELECTRICAL PARTS LIST AND SCHEMATIC CHANGES**CHANGE TO READ:**

| | | |
|----|-------------|---------------------------------|
| A5 | 670-7972-04 | CKT BD ASSY: DEMODULATOR (1740) |
| A5 | 670-7973-05 | CKT BD ASSY: DEMODULATOR (1741) |
| A5 | 670-3848-05 | CKT BD ASSY: DEMODULATOR (1742) |

DIAG LOCATION

| | | | |
|--------|-------------|---|---|
| A5R596 | 321-0270-00 | RES, FXD, FILM; 6.34 K Ohm, 1%, 0.125 W, (1741) | 5 |
| A5R596 | 321-0274-00 | RES, FXD, FILM; 6.98 K Ohm, 1%, 0.125 W, (1740, 1742) | 5 |
| A5R796 | 321-0223-00 | RES, FXD, FILM; 2.05 K Ohm, 1%, 0.125W, (1740, 1742) | 5 |

ADD:

| | | | |
|---------|-------------|---|---|
| A5CR591 | 152-0141-02 | SEMICON DVC, DI SW, SI, 30 V, 150 MA, (1740, 1741, 1742) | 5 |
| A5C594 | 283-0642-00 | CAP, FXD, MICA DI; 33 PF, ± 0.5 PF, 300V (1740, 1741, 1742) | 5 |
| A5C693 | 283-1378-00 | CAP, FXD, PLASTIC; 0.1 Uf, 20%, 50 V (1740, 1741, 1742) | 5 |
| A5R797 | 321-0223-00 | RES,FXD,FILM; 2.05 K Ohm, 1%, 0.125W (1740, 1741, 1742) | 5 |

REMOVE:

| | | | |
|--------|-------------|---|---|
| A5C220 | 283-0618-00 | CAP, FXD, MICA DI; 130 PF, 2%, 400 V (1740, 1742) | 6 |
| A5C220 | 283-0674-00 | CAP, FXD, MICA DI; 85 PF, 1%, 500V (1741) | 5 |
| A5L392 | 108-0317-00 | COIL, RF FIXED, 15UH ON POWDER FORM (1740, 1741, 1742) | 5 |
| A5R394 | 315-0101-00 | RES, FXD, FILM; 100 Ohm, 5%, 0.25 W (1740, 1741, 1742) | 5 |
| A5R591 | 315-0512-00 | RES, FXD, FILM; 5.1 K Ohm, 5%, 0.25W (1740, 1741, 1742) | 5 |

Added parts located on diagram 5, see next page.

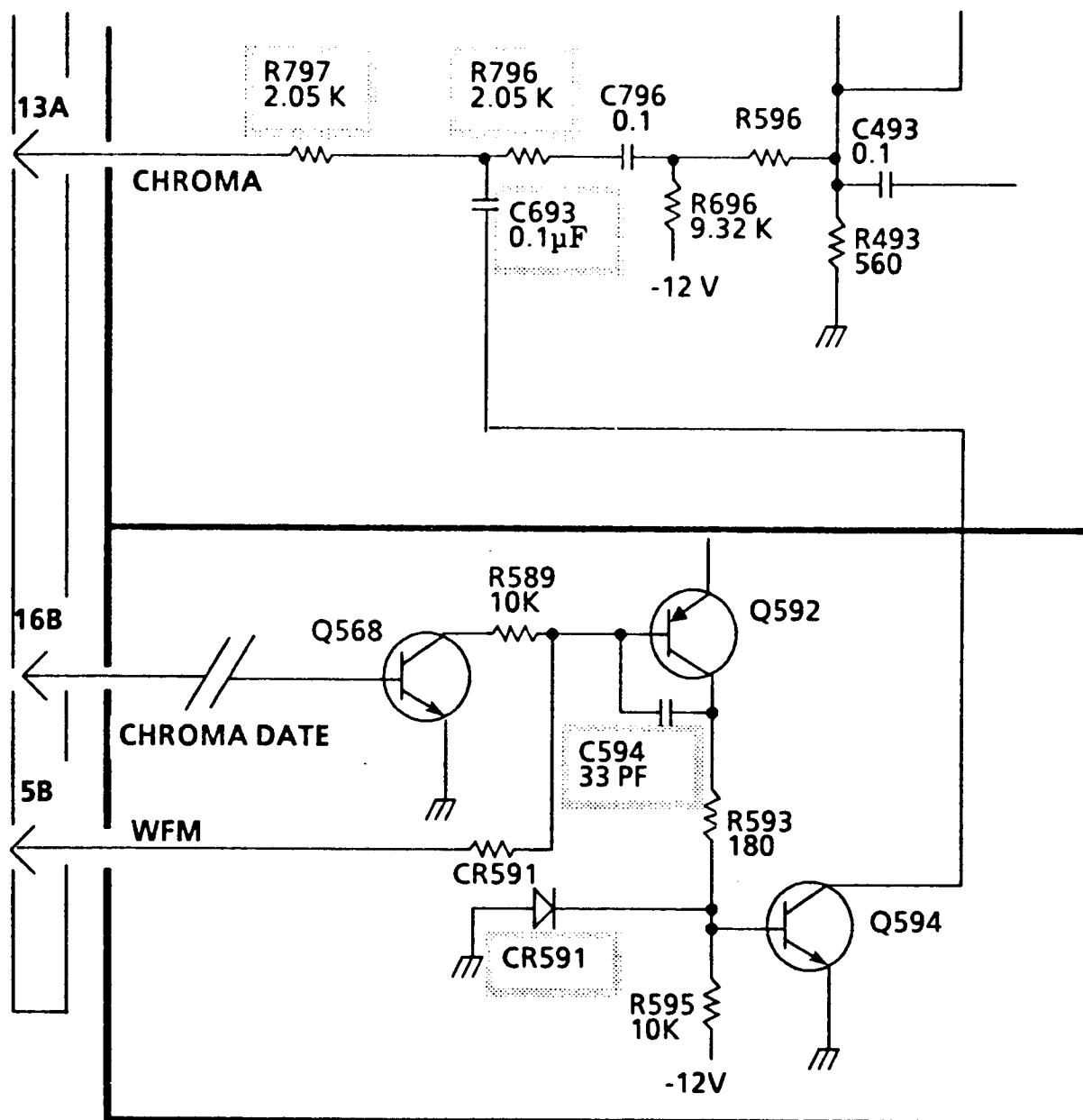


DIAGRAM 5

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

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

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


Articles for publication should be submitted directly to:

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Beaverton, Oregon 97077

Attention: Mary Ellen Zander
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