



TYPE 575 TRANSISTOR CURVE TRACER — NOISE ON HORIZONTAL AND VERTICAL ATTENUATOR SWITCHES

Under extreme environmental conditions, foreign material can build up on switch contacts and cause excessive electrical noise. This noise can be particularly objectionable.

The application of a thin film of Cramolin cleaner and lubricant (Tektronix part number 006-197) will solve this problem. Usage of Cramolin will result in approximately 40 times improvement in reducing noise and wear, over a dry switch.

Cramolin should be applied with a small artist-type camel-hair brush. Just a drop placed on the brush and then applied to the switch contacts and rotor will give good results. After application, rotate the switch back and forth through its range several times. This aids the cleaning and lubrication action. Avoid the use of excessive amounts of Cramolin. Anything more than a thin film will only detract from the neatness of your work and will neither hasten nor aid the cleaning and lubricating action.

Cramolin may be obtained through your local Tektronix Field Engineer, Representative, Field Office or Distributor.

TEKTRONIX INSTRUMENTS WITH FORCED-AIR VENTILATION — FAN MOTOR SALVAGE

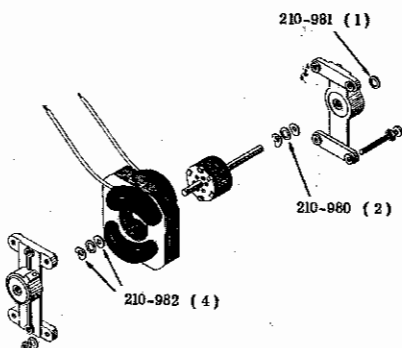


Figure 4. Exploded drawing of fan motor, part number 147-001.

Many Tektronix instruments employing forced-air ventilation use the same type fan motor. Tektronix part number for this motor is 147-001. When these motors begin to display signs of wear (normally

after extended periods of service) they may be salvaged to give many more hours of use. Indications of wear can be a noisy motor, and/or excessive end play of the motor shaft. (You should note here that a bent or out of balance fan blade can vibrate and give the appearance of a noisy motor. Check your fan blade before finally assessing the cause of noise.)

The cause of noise or shaft end play in a 147-001 motor is wear on the seven washers shown in Figure 4. To replace the washers shown in this exploded drawing you will need:

Qty.	Part #	
2 each	210-980	steel washers
4 each	210-982	beryllium washers
1 each	210-981	fiber washer

These parts may be ordered through your local Tektronix Field Engineer, Representative, Field Office or Distributor.

The Mechanical parts list in the Instruction Manual for your instrument gives the Tektronix part number for the fan motor. We remind you, the information given here applies only to instruments using fan motors part numbered 147-001.

TYPE 661 SAMPLING OSCILLOSCOPE — DELAYED PULSE MODIFICATION

Here is a do-it-yourself modification that will protect the Tunnel diode D992 (in the Delayed Pulse circuit) from excessive current during the warm-up time of V694 and V814. The modification routes the current supply through relay K601 until the instrument is warmed up, at which time normal supply current is restored. This modification applies to Type 661 instruments serial numbers 101 through 2219.

The following instructions should aid in rewiring the relay:

IMPORTANT: Use silver-bearing solder when soldering to ceramic strips.

- () 1. Unsolder from relay K601:
 - () white-violet wire
 - () sleeving-covered wire
 - () gray-red-red wire
- () 2. Replace the sleeving-covered wire with a piece of wire and sleeving that is 1/8" longer.

- () 3. Solder the new sleeving-covered wire and the white-violet wire to the terminals shown in Figure 1.

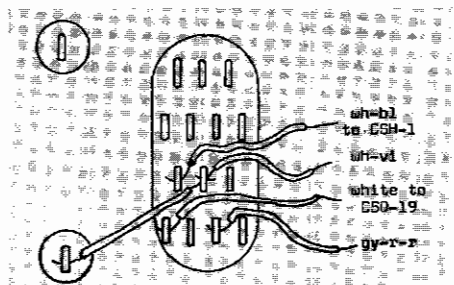


Figure 1. Diagram showing solder terminals on relay K601.

- () Solder the gray-red-red wire to the terminal shown in Figure 1.
- () 4. Solder a 10" piece of #22 white-black wire and a 6" piece of white wire to the terminals shown in Figure 1.
- () 5. Solder the other end of the white-black wire to CSH-1 (locate in Figure 2).

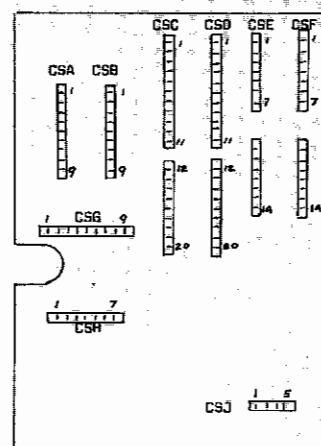


Figure 2. Diagram showing layout of ceramic strip terminals referred to in Delayed Pulse Modification.

- () 6. Solder the other end of the white wire to CSD-19 (locate in Figure 2). This completes the modification.
- () 7. Check wiring for accuracy and change Interconnecting Sockets dia-

gram in the Type 661 Instruction Manual to agree with Figure 3.

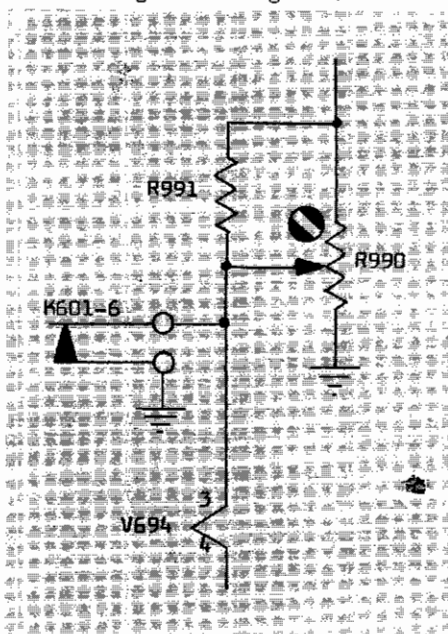


Figure 3. Schematic of K601 relay after performing Delayed Pulse Modification.

TYPE 575 TRANSISTOR CURVE TRACER—VIEWING FIELD EFFECT TRANSISTORS' CURVES

Normally, a Type 575 Transistor Curve Tracer is limited in displaying a family of curves for an FET (field effect transistor). When the STEP SELECTOR control of the Type 575's Base Step Generator is set to the maximum (200 ma) position it will not completely cutoff the FET.

A simple modification is to place a 10 k, ½ w, 1% precision resistor between the base and emitter terminals of the Type 575

and then set the Base Step Generators STEP SELECTOR control to 0.05 ma. This gives an IR drop between the gate and source terminals of the FET of 0.5 volts per step. This is sufficient to view the complete family of curves from zero to cutoff.

TYPE 530, TYPE 530A, TYPE 540, TYPE 540A, TYPE 540B, TYPE 550, TYPE 585 AND TYPE 585A OSCILLOSCOPES — EXCESSIVE DELAY BEFORE CRT BEAM COMES ON

Time-delay relays used in the above oscilloscopes delay their operation for approximately 45 seconds after the power switch is turned on. This brief delay allows the tubes to warm up to near their operating temperature before the dc operating voltages are applied. At the end of this delay period the cathode-ray beam should appear on the face of the crt.

A more lengthy delay (two or more minutes — or up to 30 minutes in aggravated cases) can very often be traced to low emission by one or both of the 5642 tubes in the crt grid supply and the crt high-voltage cathode supply. Or, it may be due to low emission in the crt itself.

To determine if the 5642 tubes are at fault, remove the ground strap from the crt-cathode connector located on the rear panel of the oscilloscope. Patch a cord from the calibrator output to the crt-cathode connector and feed in 10 volts of calibrator signal. With the sweep free running you should now see a modulated trace on the face of the crt. Advance the calibrator control through the 20, 50, and 100 volts positions. If the modulated trace remains on the crt face the 5642 tubes are most probably functioning properly.

To check for low emission in the crt, remove the calibrator signal from the crt-cathode connector and reconnect the ground strap. Adjust the FOCUS and ASTIGMATISM controls for largest diameter spot. With the sweep turned off, adjust the INTENSITY control to where the de-focused spot on the crt face has a very slight halo. Remove the left-hand side panel from the oscilloscope. Then, with the tip of a magnetized screw driver, touch the base of the crt near where it joins the glass neck. While moving the tip of the screw driver around the available circumference of the crt base, check for dark areas within the defocused spot on the crt face. If dark areas are observed the crt is suffering from low emission.

If either the 5642's or the crt are low in emission they should be replaced.

TYPE CA PLUG-IN UNIT — LACK OF DUAL-TRACE DURING WARM UP

Type CA Plug-In Units, serial numbers 101 through 34790, may exhibit a lack of dual trace during the period when the instrument is warming up. The problem is caused by V3382. This 6AL5 tube in the switching circuitry has its cathodes returned to the -150 volt supply through a 1.8 meg resistor in the oscilloscope via pin 16 of the interconnecting plug. The 1.8 meg resistor provides a current source for the 6AL5 that tends to balance the multivibrator plates (V3375) in the CA unit; both halves saturate and prevent multivibrator action.

A 330 k, ¼ w, 10%, composition resistor (Tektronix part number 316-334) added between pin 5 of V3382 and +225 volts will cure the problem.

NEW FIELD MODIFICATION KITS

TYPE 111 PRETRIGGER PULSE GENERATORS—PULSE WAVEFORM IMPROVEMENTS

This modification reduces overshoot, ringing, and other aberrations in the pulse waveform. It also improves the risetime of the negative pulse.

Primarily, the modification consists of replacing the Avalanche transistor (Q84) and reworking the associated circuitry on the etched circuit board. New "transition pieces" are used to connect the Charge Line and Output Polarity coaxial cables to the board.

Parts Replacement Kit 050-216 is also included to replace the OUTPUT POLARITY switch and Charge Line cable.

This modification applies to Type 111 instruments with serial numbers below 800. Order through your Tektronix Field Engineer, Field Representative, Field Office or Distributor. Specify Tektronix Part Number 040-392.

TYPE 4S2 DUAL-TRACE SAMPLING UNITS—TRANSIENT RESPONSE IMPROVEMENTS

This modification improves the transient response and reduces ringing on fast-rise signals in the Type 4S2:

1. Replacing Gate (bridge) diodes with closer-matched and lower-capacitance diodes.
2. Making the sampling bridge compensation networks adjustable.
3. Substituting 200 Ω resistors for the ferrite beads between sampling bridge and Nuistor grid.
4. Terminating the strobe pulse lines with 100 Ω resistors.
5. Adding grid-bias balancing potentiometers for each Nuistor.
6. Decoupling the -100 and +300 voltages to the Sampler and Gate-Generator circuits.

This modification applies to Type 4S2 instruments with serial numbers below 301.

Order through your local Tektronix Field Engineer, Field Representative, Field Office or Distributor. Specify Tektronix part number 040-379.

TYPE 53/54C AND TYPE CA DUAL-TRACE PLUG-IN UNITS—SLAVE TO AUTOMATIC DISPLAY SWITCHING

This modification allows Channels A and B of either Type 53/54C, serial numbers 3710-up, or Type CA, serial numbers 101 through 64009, to be slaved to the respective sweeps of the Type 547 Oscilloscope, when the Type 547 is operated in A ALT B mode. The modification does not change the operation of the Type 53/54C or Type CA when operated in any other instrument.

Order through your local Tektronix Field Engineer, Field Representative, Field Office or Distributor. Specify Tektronix part number 040-391.

RELAY RACK CRADLE ASSEMBLY

Three new Field Modification Kits provide a rear support cradle for installing rack-mounted instruments in a backless relay rack by the use of slide-out tracks. The slide-out tracks are not included in the modification kits and must be ordered separately.

Slide-out tracks allow the instrument to be pulled out like a drawer. When pulled out, the instrument can be locked in one of seven positions: horizontal, or 45°, 90°, or 105° above and below horizontal.

Order through your local Tektronix Field Engineer, Field Representative, Field Office or Distributor from the following information.

Field Modification Kit, Tektronix part number 040-344, applies to the following instruments:

Type 127	serial numbers	309 - up
Type RM15	serial numbers	101 - up
Type 526	serial numbers	101 - up
Type RM561	serial numbers	101 - up
Type RM561A	serial numbers	5000 - up
Type RM564	serial numbers	100 - up
Type RM647	serial numbers	100 - up

Order slide-out track assemblies separately, as follows:

Types 127, RM15, and RM647 1 ea. 351-006

Types RM561, RM561A,
RM564 1 ea. 351-050

Type 526 1 ea. 351-001
1 ea. 351-011

Field Modification Kit, Tektronix part number 040-346, applies to the following instruments:

Type RM565	serial numbers	101 - up
Type RM567	serial numbers	101 - up

Order slide-out track assemblies, Tektronix part number 351-055 (1 pr.), separately for these instruments.

Field Modification Kit, Tektronix part number 040-345 applies to the following instruments:

Type RM16	serial numbers	101 - up
Type RM17	serial numbers	101 - up

Order slide-out track assemblies, Tektronix part number 351-083 (1 pr.), separately for these instruments.

TYPE 3T77 SAMPLING PLUG-IN UNITS, S/N'S 840 TO 1999 — IMPROVED SINE-WAVE TRIGGERING

This modification imparts a greater stability to the display during triggering on high-frequency sine waves. A trigger-circuit change allows switching to a lock-on type of operation when displaying high-frequency sine waves and eliminates display break-up caused by drift in recovery time.

A new push-pull Recovery control replaces the old control.

Pulling the control to the ON position synchronizes the circuit on sine waves above approximately 30 Mc. With the control pushed in the instrument triggers on signals below 30 Mc. Order through your local Tektronix Field Engineer, Field Office or Representative. Specify Tektronix Part Number 040-366.

SCOPEMOBILE® CART ADAPTER

This modification adapts the Type 202, Type 202-1, Type 202-2 and Type 204 Scopemobile carts for use with a Type 502 or Type 502A Oscilloscope. Two adapter plates fasten to the Scopemobile cart and prevent the oscilloscope from shifting sideways. Order through your local Tektronix Field Engineer, Field Office or Representative. Specify Tektronix Part Number 040-365.

TYPE 502 AND TYPE 502A OSCILLOSCOPES—SAWTOOTH AND +GATE OUT

This modification installs two UHF output connectors (one for the direct coupled Sawtooth and one for the +Gate Out waveforms) on the rear panel of the Type 502 or Type 502A Oscilloscopes. The +Gate Out waveform is 40 volts and of the same duration as the +150-volt Sawtooth waveform. The waveforms are dc coupled to the connector via a dual cathode-follower assembly which mounts on the Time/CM switch bracket.

Order through your local Tektronix Field Engineer, Field Office or Representative. Specify Tektronix Part Number 040-312.

TYPE 502 OSCILLOSCOPE—SILICON RECTIFIER

This modification replaces the selenium rectifier (SR642) used in the Type 502 with silicon rectifiers which offer more reliability and longer life. Order through your local Tektronix Field Engineer, Field Office or Representative. Specify Tektronix Part Number 040-383.

TYPE 108 FAST-RISE MERCURY PULSER — SILICON RECTIFIER

This modification replaces the original selenium rectifiers (SR3A,B) with silicon rectifiers which offer more reliability and longer life.

The modification is applicable to all Type 108 Mercury Pulsers.

Order through your Tektronix Field Engineer or local Field Office. Specify Tektronix part number 040-388.

TYPE 527 WAVEFORM MONITOR—LINE SELECTOR

This modification installs a prewired Video Output-Amplifier chassis in the Type 527 to allow a picture monitor to be connected directly to the Type 527 and to display the signal, being displayed on the Type 527, on the picture monitor.

The modification also installs a prewired Line-Selector chassis circuit for detailed observation of any one TV line in a frame. A Field-Shift circuit provides line selection from either the odd or the even field. A Line-Intensification circuit rapidly identifies the line being observed and the selected line is intensified on the picture monitor via the Video-Output connector of the Type 527 Waveform Monitor.

Order through your local Tektronix Field Engineer, Field Office or Representative.

Specify for:

Type	S/n's	Tektronix Part Number
527	151-579	040-356
RM527	151-979	040-354
527	580 and up	040-359
RM527	980 and up	040-358

