HIGH VOLTAGE TRANSFORMER SECONDARY VOLTAGE INCREASED TO INSURE TRACE CUTOFF

See SQB

M457

Effective Prod SN not given

DESCRIPTION:

The intensity control does not completely extinguish the CRT trace when the sweep is running. The problem is due to not enough negative voltage from the HV supply. The number of turns on the HV transformer secondary winding was increased. The part number of the HV transformer remains unchanged.

Parts Required for Field Installation:

See Part listed below.

R (?)	1 M 1/2W 10%	302-0105-00

INSTALLATION INSTRUCTIONS:

Install a 1 M 1/2W resistor between -150 V and the junction of R914 (100k) and R913 (5.6 M). NOTE: This resistor drops the average level of blanking voltage at low end of negative high voltage to CRT grid.

UNBLANKING CF RESISTOR RELOCATED TO PREVENT SLIGHT TRACE FOLD OVER AT THE START OF THE SWEEP

See SQB

M460

Effective Prod SN 175

Usable in field instruments SN 101-174

DESCRIPTION:

To prevent feed through of unblanking signal on the sweep waveform which caused a slight fold over at the start of the sweep. Relocate R240, 22k 2W resistor from its place near R318, to a point on the chassis near V210.

Parts Removed:

Post,	PB 3/4 12 (2)	no number
Terminal	TET 24C (2)	no number
Screw	6-32 x 5/16 (2)	211-0507-00

Parts Added:

Post, ceramic 3/4	129-0009-00
Nut, 6-32 x 1/4	210-0407-00

Parts Required for Field Installation:

See Parts listed below.

Strip, ceramic 1-notch (2)	124-0100-00
Grommet, 1/4	348-0002-00
Spacer, cer. strip (2)	361-0007-00
Wire, #22 solid 10-1/2in. white-red	175-0522-00
Wire, #22 solid 2in. white-brown-red-brown	175-0522-00

continued

INSTALLATION INSTRUCTIONS:

Relocate R240, 22k 2W resistor, from the terminal board at the rear of the sweep chassis to the area between V210 and V211 on the tube side of the chassis.

Drill holes as required to mount ceramic strips and to provide grommet through which resistor hookup wires may be passed.

TIME BASE GENERATOR FAST SWEEP SPEED LINEARITY IMPROVED BY SHIELDING CATHODE LEAD OF V213A

See SQB M474

Effective Prod SN 175

Usable in field instruments SN 101-174

DESCRIPTION:

To prevent the sawtooth signal from coupling to the cathode of the constant current tube V213A. This stray coupling caused non-linearity on the highest sweep ranges on some instruments. Change cathode lead to shielded wire. Also see M474B.

Parts Removed:		Parts Added:	
Wire, #22 solid 10 in. white-blue	175-0522-00	Cable, Belden 8411	175-0004-00

Parts Required for Field Installation:

See 'Parts Added'.

INSTALLATION INSTRUCTIONS:

Replace the white-blue wire, between pin 3 of V213 and the TIME/DIVISION switch, with a 10 in. 10 in. length of Belden 8411 cable. Run cable on underside of sweep chassis next to the bulkhead.

TIME BASE GENERATOR AND TRIGGER

FAST SWEEP SPEED LINEARITY AND STABILITY IMPROVED BY CHANGING VARIOUS COMPONENTS

See SQB M474B

Effective Prod SN 175

Usable in field instruments SN 101-174

DESCRIPTION:

Various components in the Time Base Generator were changed to improve sweep linearity and sweep and trigger stability at fast sweep speeds.

Parts Removed:

C272	22pF cer	281-0510-00
C276	3-12pF var	281-0007-00
C300	5-25pF var	281-0010-00
C303	4.7pF cer	281-0501-00
R282C	60k 1/2W 1%	309-0067-00

Parts Added:

C272	47pF cer	281-0518-00
C276	1.5-7 pF var	281-0006-00
C303	0.5-5pF var	281-0001-00
R282C	56.5k 1/2W 1%	309-0040-00
R291	3.3k 1/2W 10%	302-0332-00

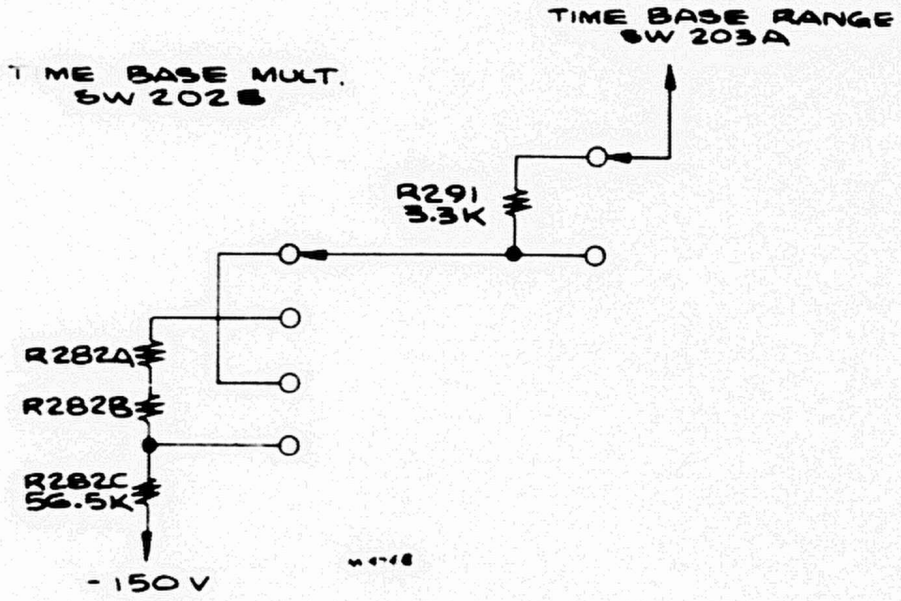
Parts Required for Field Installation:

See 'Parts Added'.

INSTALLATION INSTRUCTIONS:

Change the following to new values:

C272 (at pin 1 of V213A) from 22pF to 47pF
C276 (at pin 6 of V214B) from 3-12pF to 1.5-7pF
C303 (at pin 3 of V224A) from 4.7pF to 0.5-5pF
R282C (on Time Base Multiplier switch) from 60k to 56.5k 1%
Remove C300 (near V222)
Add R291 to Time Base Range switch as shown in schematic



TIME BASE GENERATOR OSCILLATIONS PREVENTED BY ADDITION OF SUPPRESSOR RESISTOR

See SQB

M475

Effective Prod SN 175 w/exceptions 111, 134, 140, 143, 146, 149, 150, 156, 157, 160, 163-73

Usable in field instruments SN 101-174

DESCRIPTION:

To prevent oscillation in the sawtooth output cathode follower, add a 47Ω 1/2W resistor in series with grid lead at pin 7 of V222B.

Parts Removed:

Parts Added:

R265	47Ω 1/2W 10%	302-0470-00

Parts Required for Field Installation:

See 'Parts Added'.

INSTALLATION INSTRUCTIONS:

Add a 47Ω 1/2W resistor, in series with grid lead, at pin 7 of V222B.

TIME BASE GENERATOR OSCILLATIONS PREVENTED BY ADDITION OF SUPPRESSOR RESISTOR

See SQB

M475A

Effective Prod SN 175

Usable in field instruments SN 101-174

DESCRIPTION:

To prevent oscillation in the +gate output cathode follower V214A, add a 47Ω 1/2W suppressor resistor in series with grid lead, pin 9 of V214A.

Parts Removed:

Parts Added:

R239	47Ω 1/2W 10%	302-0470-00

Parts Required for Field Installation:

See 'Parts Added'.

INSTALLATION INSTRUCTIONS:

Add a 47Ω 1/2W resistor in series with grid lead at pin 9 of V214A.

VERTICAL AMP INPUT CAPACITANCE STABILIZED FROM CABINET EFFECTS BY MOUNTING C1 RIGIDLY

INFORMATION ONLY

M478

Effective Prod SN 175

DESCRIPTION:

To stabilize the input capacitance from cabinet effects, mount C1 rigidly to Vertical Amplifier chassis using a plastic clamp.

Parts Removed:

Parts Added:

Bolt, spade 3/8 in.		214-0059-00
Nut, 6-32 x 1/4	(2)	210-0407-00
Lockwasher, int #6	(2)	210-0006-00

POWER SUPPLY THERMAL CUTOUT ADDED TO PREVENT DAMAGE DUE TO OVERHEATING

See SQB

M479

Effective Prod SN 175

Usable in field instruments SN 101-174

DESCRIPTION:

To prevent damage to components due to overheating, add a thermal cutout in series with the unswitched AC lead to the power transformer.

Parts Removed:

Parts Added:

TK401	Thermal Cutout	260-0157-00

Parts Required for Field Installation:

See 'Parts Added' and parts listed below.

Wire, #18 yel-bn-bn-bn (6in.)		175-0504-00
Screw, 6-32 x 5/16in.	(2)	211-0507-00
Nut, Kepts 6-32	(2)	210-0457-00

INSTALLATION INSTRUCTIONS:

Mount the thermal cutout on the bulkhead power supply chassis in the area just behind V403 (12B4). Use 6-32 hardware. Unsolder the yel-bn-bn-bn wire and the wh-gy from pin 1 of the power transformer and resolder them to one side of the thermal cutout. Solder a length of yel-bn-bn-bn wire, between pin 1 of the power transformer and the other side of the cutout.

CABINET STAND RUBBER BUMPER ADDED TO PREVENT SCRATCHING OF SUPPORTING SURFACES

INFORMATION ONLY M513

Effective Prod SN 245

DESCRIPTION:

8-1/4 in. length of X-200 extruded rubber bumper material added to edge of stand to prevent scratching of supporting surfaces.

Parts Removed:

Parts Added:

Extrusion rubber (8-1/4in) no number

PREAMPLIFIER FREQUENCY RESPONSE IMPROVED BY ADDING AND CHANGING OF VARIOUS COMPONENTS

See SQB M498

Effective Prod SN 268

Usable in field instruments SN 101-267

DESCRIPTION:

Preamplifier transient response improved by:

1. Adding an RC time constant in series with R15
2. Removing R19 (reinstalled in M507)
3. Changing value of R36
4. Adding a plate decoupling cap to V2B. Install M507 at same time.

Parts Removed:

R19	6.8k 1/2W	302-0683-00
R36	220Ω 1/2W	302-0221-00

Parts Added:

* C13	0.01 μF disc	283-0002-00
* C16	0.02 μF disc	283-0004-00
R16	12Ω 1/2W	302-0120-00
* R36	150Ω 1/2W	302-0151-00

Parts Required for Field Installation:

See 'Parts Added' with asterisks and part listed below.

R16	10Ω 1/2W	302-0100-00

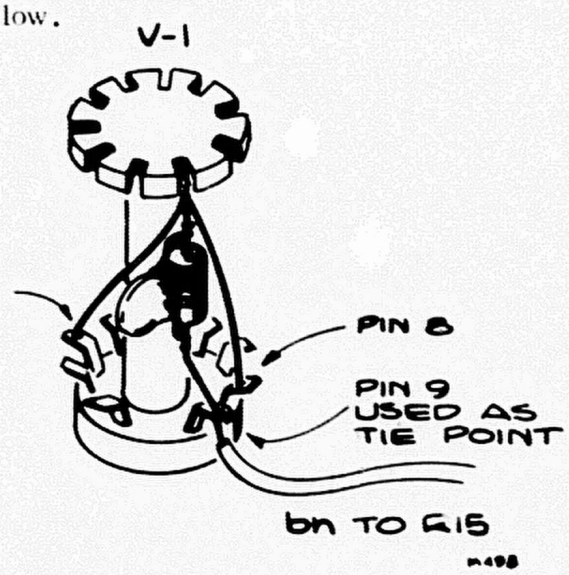
INSTALLATION INSTRUCTIONS:

a) Change R36 (across L2) from 220Ω to 150Ω.

b) Install a network of R16 and C16 (10Ω and 0.02 μF in parallel), in series with V1 cathode lead to R15. See drawing.

c) Install C13, 0.01 μF discap from pin 6 of V2B to ground.

d) Recalibrate Vertical Preamplifier.



CRT CHANGED TO P2 PHOSPHOR AS STANDARD

INFORMATION ONLY

M522

Effective Prod SN 280

DESCRIPTION:

Provide the standard production instrument with a P2 CRT. Change from 3WP1 to 3WP2 except for special customer requests.

Parts Removed:			Parts Added:		
V806	3WP1	154-0058-00	V806	3WP2	154-0059-00

VERTICAL AMPLIFIER TRANSIENT RESPONSE IMPROVED BY ADDING SEVERAL NEW COMPONENTS

See SQB

M507

Effective Prod SN 299 w/exceptions 200, 206, 236, 238, 242, 244, 249, 255, 257-8, 260, 264, 267, 269, 272, 277, 282, 289, 292-297

Usable in field instruments SN 101-298

DESCRIPTION:

Improve Vertical Amplifier response by adding:

1. RF bypass caps to the heater string and to plate of V8B.
2. R19 6.8k 1/2W across L1.
3. R59 10Ω 1/2W parasitic suppressor resistor to grid of V8B.

Parts Removed:

Parts Added:

C26	0.01 μF discap	283-0002-00
C27	0.01 μF discap	283-0002-00
C17	0.01 μF discap	283-0002-00
C18	0.01 μF discap	283-0002-00
R19	6.8k 1/2W 10%	302-0682-00
R59	10Ω 1/2W 10%	302-0100-00

Parts Required for Field Installation:

See 'Parts Added'.

INSTALLATION INSTRUCTION:

a) Add C26, 0.01 μF, between pin 5 of V2 and ground.

b) Add C27, 0.01 μF, between pin 4 of V2 and ground.

c) Add C17, 0.01 μF, between pin 4 of V10 and ground.

d) Add C18, 0.01 μF, between pin 6 of V8 and ground.

e) Add R19, 6.8k resistor, across L1, if not already present.

f) Add R59, 10Ω resistor, in series with grid lead at pin 7 of V8B.

g) Recalibrate the Vertical Amplifier.

HV POWER SUPPLY RECTIFIERS FAILURE REDUCED BY INCREASING FILAMENT VOLTAGES

INFORMATION ONLY

M517

Effective Prod SN not given

DESCRIPTION:

Reduce HV rectifier failure by increasing the filament voltage. T801 HV transformer turns ratio changed. Part number remains unchanged.

FRONT PANEL GROUND POST ADDED FOR USE WITH VERTICAL INPUT CONNECTOR

See SQB

M525

Effective Prod SN 346

Usable in field instruments SN 101-345

DESCRIPTION:

To facilitate connections etc., a ground post was added just below the UHF INPUT connector.

Parts Removed:		Parts Added:	
		Post, grounding	129-0020-00

Parts Required for Field Installation:

See 'Parts Added'.

INSTALLATION INSTRUCTIONS:

Drill a 3/16 in. hole 1 in. below the center of the Vertical Input connector and mount the ground post.

CABINET STUDS CHANGED TO PREVENT BUCKLING OF CABINET BACK

INFORMATION ONLY

M528

Effective Prod SN not given

DESCRIPTION:

To prevent buckling of the cabinet back, the fastening studs were lengthened.

Parts Removed:		Parts Added:	
Stud 98-05-5-15 (2)	no number	Stud, 98-05-5-22 (2)	no number

POWER SUPPLY RESISTORS ADDED TO IMPROVE VERTICAL PREAMPLIFIER STABILITY

See SQB

M539-1

Effective Prod SN 348

Usable in field instruments SN 101-347

DESCRIPTION:

Improve stability of the Vertical Amplifier when in the preamp position by increasing the time constant in the grid circuit of the voltage regulator feedback amplifier in the +225 V and +350 V supplies.

Also see M539-3, following M548.

Parts Removed:

Parts Added:

*	R446	2.2 M 1/2 W	302-0225-00
*	R469	2.2 M 1/2 W	302-0225-00

Parts Required for Field Installation:

See 'Parts Added' with asterisks.

INSTALLATION INSTRUCTIONS: Refer to drawing.

a) Remove wires between CSB-11, 12 and 13.

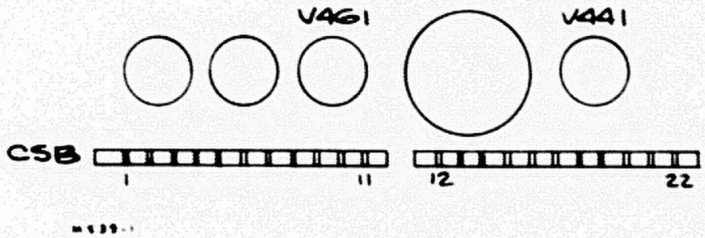
b) Replace tubing covered wire, between pin 1 of V461 and CSB-11, with a 2.2 M 1/2 W resistor (R469).

c) Add a length of bare wire between CSB-11 and CSB-13 (dress this wire away from CSB-12).

d) Remove bare wire between CSB-18 and CSB-19.

e) Add a 2.2 M 1/2 W resistor (R446) between pin 1 of V441 and CSB-19.

f) Check accuracy of +225 and +350 V supplies.



POWER SUPPLY FAILURE PREVENTED BY INCREASING THE VOLTAGE RATING OF C461

INFORMATION ONLY

M539-2

Effective Prod SN 348

DESCRIPTION:

Failure of C461 prevented by increasing the voltage rating from 400 V to 600 V

Parts Removed:			Parts Added:		
C461	0.01 μF 400 V	281-0510-00	C461	0.01 μF 600 V	281-0511-00

VERTICAL AMPLIFIER RESISTOR VALUE CHANGED TO IMPROVE TRANSIENT RESPONSE

INFORMATION ONLY

M518

Effective Prod SN 351

DESCRIPTION:

Change R16 from 12Ω to 10Ω. The value is more correct for the average production instrument.

This mod is an addendum to M498.

Parts Removed:			Parts Added:		
R16	12Ω 1/2W 10%	302-0120-00	R16	10Ω 1/2W 10%	302-0100-00

VERTICAL AMPLIFIER GAIN INCREASED BY REMOVING 10Ω RESISTORS IN VERTICAL OUTPUT STAGE

See SQB

M532-1

Effective Prod SN 351

Usable in field instruments SN 101-350

DESCRIPTION:

Increase gain in Vertical Amplifier by removing the 10Ω resistors in the cathode circuit of Vertical Amplifier output stage. Perform this mod only where inadequate gain is a problem.

Parts Removed:			Parts Added:
R72	10Ω 1/2W 10%	302-0100-00	
R74	10Ω 1/2W 10%	302-0100-00	
R91	10Ω 1/2W 10%	302-0100-00	
R94	10Ω 1/2W 10%	302-0100-00	

INSTALLATION INSTRUCTIONS:

Replace R72, R74, R91, R94 (10Ω 1/2W resistors) each with a length of bare wire.

VERTICAL AMPLIFIER COMPONENTS CHANGED TO CUT PRODUCTION COSTS

INFORMATION ONLY

M532-2

Effective Prod SN 351

DESCRIPTION:

Production costs cut by changing R59 from 12Ω to 10Ω and removing several mechanical components.

Parts Removed:			Parts Added:		
R59	12Ω 1/2W 10%	302-0120-00	R59	10Ω 1/2W 10%	302-0100-00
Post, ceramic 3/4in.		129-0009-00	Post, PB 1-1/2 TB1A		no number
Nut, 6-32 x 1/4		210-0407-00			
Lockwasher, int #6		210-0006-00			
Post, 1-1/2 TB1B1		no number			

VERTICAL AMPLIFIER HUM DECREASED BY COUPLING C20 TO +100 V INSTEAD OF GROUND

See SQB

M499-1

Effective Prod SN 357

Usable in field instruments SN 101-356

DESCRIPTION:

Decrease visible hum on trace from Vertical Amplifier by coupling C20 to +100 V instead of ground.

Parts Removed:			Parts Added:		
C20	0.01 μF discap	283-0002-00	C20	0.01 μF PT 400 V	285-0510-00

Parts Required for Field Installation:

See 'Parts Added'.

INSTALLATION INSTRUCTIONS:

Change C20, 0.01 μF discap (at pin 2 of V8A), to a 0.01 μF 400 V tubular capacitor and move the end which goes to ground to +100 V.

VERTICAL AMPLIFIER POSITION AND 5X MULTIPLIER ADJUSTMENT RANGE IMPROVED BY CHANGING DIVIDER RATIOS

INFORMATION ONLY

M499-2

Effective Prod SN 357

DESCRIPTION:

1. VERTICAL POSITION range is improved by changing the value of R66 and R70 (POSITION CONTROL) and adding a 22k resistor in shunt with R70.

2. 5X Multiplier adjustment range improved by changing the value of R52.

Parts Removed:			Parts Added:		
R52	1k 1/2W 10%	302-0102-00	R52	1.2k 1/2W 10%	302-0122-00
R66	18k 1/2W 10%	302-0183-00	R66	22k 1/2W 5%	301-0223-00
R70	20k pot	311-0018-00	R70	250k pot	311-0032-00
			R69	22k 1/2W 5%	301-0223-00

TIME BASE TIMING CAPACITOR CHANGED TO PREVENT NON-LINEAR SWEEP

See SQB

M519-1

Effective Prod SN 357

Usable in field instruments SN 101-356

DESCRIPTION:

Prevent non-linear sweep due to 'soak effect' of C280C, when the Time/Division switch is in the 1 millisec position. Change C280C from a 0.01μF paper tubular to a 0.01 μF mica.

Parts Removed:			Parts Added:	
C280C	0.01μF PTM 400V	285-0510-00	C280C	0.01μF mica 300V no number

Parts Required for Field Installation:

C280C 0.01 μF 600V PTM 285-0511-00

INSTALLATION INSTRUCTIONS:

Replace C280C, 0.01μF 400V capacitor with a 0.01μF 600V capacitor, (or replace all the timing series with Mylar‡ capacitors by installing Parts Replacement Kit 050-0002-00.

‡ Du Pont Registered Trademark

VERTICAL AMPLIFIER DC SHIFT COMPENSATION CONTROL ADDED

See SQB

M540

Effective Prod SN 357

Usable in field instruments SN 101-356

DESCRIPTION:

To compensate for vertical DC shift, add an LC network to the plate circuit of the Vertical Amplifier output tubes.

Parts Removed:

R80	2.5 k 10 W	
R84	2.5 k 10 W	

Parts Added:

* C86	20 μF 150 V	290-0008-00
* C88	20 μF 150 V	290-0008-00
* R80	2.7 k 10 W	308-0019-00
* R84	2.7 k 10 W	308-0019-00
R86	39 k 1/2 W 10%	302-0393-00
R88	39 k 1/2 W 10%	302-0393-00
* R87	1 M pot	311-0040-00
Plate, mtg.		386-0323-00

Parts Required for Field Installation:

See 'Parts Added' with asterisks and parts listed below.

R86	33 k 1/2 W 10%	302-0333-00
R88	33 k 1/2 W 10%	302-0333-00
Nut,	3/8-32x1/2 (2)	210-0413-00
Lockwasher,	3/8 ID	210-0012-00
Screw,	6-32x5/8 Phil (2)	211-0522-00
Screw,	6-32x5/16 PHS (2)	211-0507-00
Nut,	6-32x5/16 (2)	210-0407-00
Strip, ceramic		124-0100-00
Spacer, strip		361-0007-00
Rod, spacer		385-0020-00
Wire,	#22 wh-bn-bk-bn (7-1/2in)	175-0522-00

INSTALLATION INSTRUCTIONS:

a) Mount and wire parts on mounting plate 386-0323-00 as indicated in Fig. 1.

b) Change R80 (at L4 and L6) and R84 (at L5 and L7) from 2.5 k 10 W to 2.7 k 10 W.

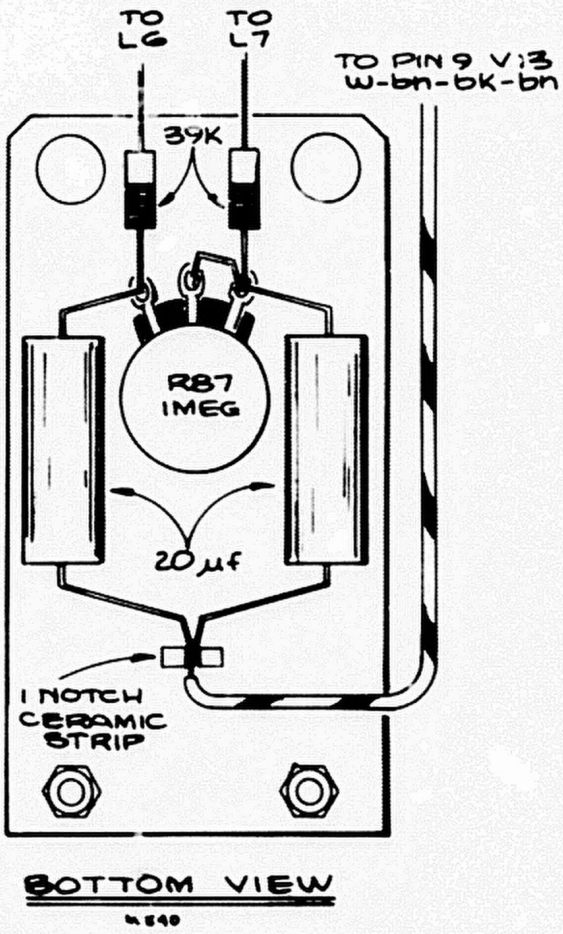


FIG. 1

continued

INSTALLATION INSTRUCTIONS (cont)

c) Mount the DC Shift Comp plate to the support bar above the CRT socket as shown in Fig. 2.

d) Wire as shown in Fig. 2.

e) Refer to your Instruction Manual and adjust L3, L4, L5, L6 and L7.

f) Set the DC Shift Comp control as follows: Set the AMPLITUDE control to the DC 0.1 VOLTS/DIVISION position and the MULTIPLIER to 2. Advance the STABILITY control until the time base is free running and center the trace vertically. Connect a lead from CAL OUT to INPUT and switch the CALIBRATOR control alternately from the OFF position to the 1-volt position. Adjust the DC Shift Comp control, R87, until the base line of the display does not shift position as the calibrator is switched off and on.

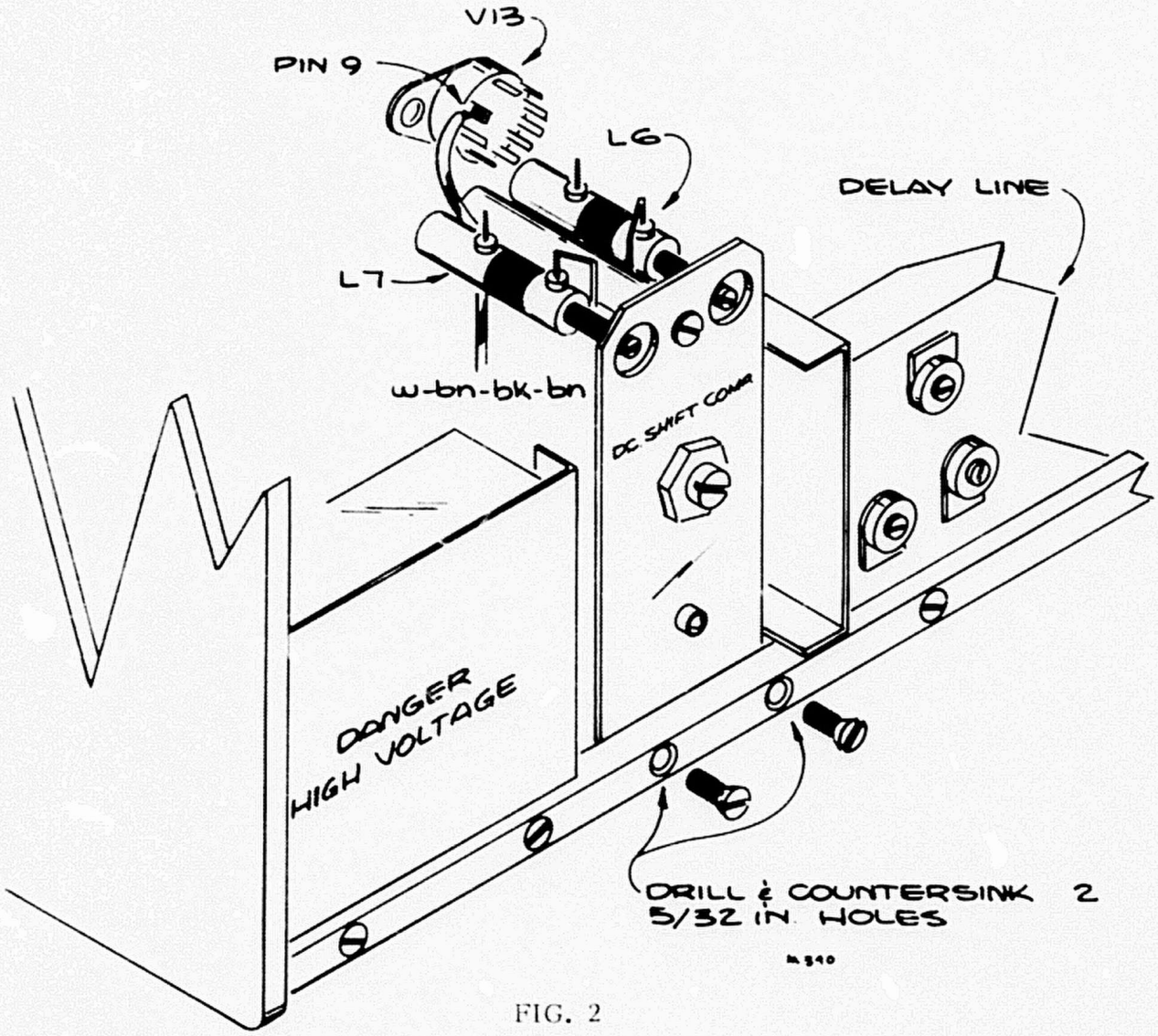


FIG. 2

VERTICAL AMPLIFIER TRANSIENT RESPONSE IMPROVED

See SQB

M515

Effective Prod SN 363

Usable in field instruments SN 101-362

DESCRIPTION:

Vertical Amplifier transient response improved by adding High Frequency bypass capacitor, C23, to Delay Line circuit.

Parts Removed:

Parts Added:

C23	0.01 μF discap	283-0002-00

Parts Required for Field Installation:

See 'Parts Added'.

INSTALLATION INSTRUCTIONS:

Add C23, 0.01 μF, in parallel with C21, 6.25 μF.

TIME BASE MAG CENTERING AND HORIZ POSITION CONTROLS RANGE IMPROVED BY CHANGING DIVIDER RESISTOR RATIOS

INFORMATION ONLY

M544

Effective Prod SN 363

Usable in field instruments SN 101-362

DESCRIPTION:

1. Improves the range of the Mag Centering adjustment by changing the divider ratio of R305 and R306.

2. Improves the range of HORIZ POSITION control by changing the value of R287 and selecting R272 and R273.

Parts Removed:

R272	18k 1 W 10%	304-0183-00
R273	47k 2 W 10%	306-0473-00
R287	8.2k 1/2 W 10%	302-0822-00
R305	68k 1 W 10%	304-0683-00

Parts Added:

R272	18k 1 W -8 + 0%)	312-0537-00
R273	47k 2 W -5+5%)	
R287	4.7k 1/2 W 10%	302-0472-00
R305	22k 1 W 10%	304-0223-00

VERT PREAMP OSCILLATIONS PREVENTED BY ADDITION OF INPUT SUPPRESSOR RESISTOR

See SQB

M548

Effective Prod SN 363

Usable in field instruments SN 101-362

DESCRIPTION:

Prevent spurious oscillations in the preamplifier by adding a 47Ω resistor in series with the Vertical Input connector.

Parts Removed:

Parts Added:

*	R8	47Ω 1/2W 10%	302-0470-00
	Post, ceramic		129-0009-00

Parts Required for Field Installation:

See 'Parts Added' with asterisk.

INSTALLATION INSTRUCTIONS:

Add a 47Ω resistor (R8) in series with C1 at the INPUT connector.

POWER SUPPLY RESISTORS CHANGED TO IMPROVE VERTICAL PREAMPLIFIER STABILITY

See SQB

M539-3

Effective Prod SN 381

Usable in field instruments SN 101-380

DESCRIPTION:

Decrease the values of the +350 V supply feedback amplifier to decrease noise and improve stability in the preamplifier.

See Mod M539-1 and 2 following M528.

Parts Removed:

R467	1.8 M 1/2 W 1%	309-0020-00
R468	750 k 1/2 W 1%	309-0010-00

Parts Added:

R467	800 k 1/2 W 1%	309-0110-00
R468	333 k 1/2 W 1%	309-0053-00

Parts Required for Field Installation:

See 'Parts Added'.

INSTALLATION INSTRUCTIONS:

a) Change R467, 1.8 M 1/2 W 1% to 800 k 1/2 W 1%.

b) Change R468, 700 k 1/2 W 1% to 333 k 1/2 W 1%.

c) Check accuracy of +350 V supply.

TIME BASE PRODUCTION COST REDUCED BY CHANGING C280 C

INFORMATION ONLY

M519-2

Effective Prod SN 395

DESCRIPTION:

To reduce cost of timing capacitor C280 C , replace the 0.01 μF mica with a 0.01 μF 600 V PTM.

See M519-1 which follows M499-2.

Parts Removed:			Parts Added:		
C280C	0.01 μF mica 300 V	no number	C280C	0.01 μF PTM 600 V	285-0511-00

TIME BASE CIRCUIT NUMBERING SYSTEM CHANGED FOR PEAKING COILS WITH SHUNT RESISTORS

INFORMATION ONLY

M533

Effective Prod SN 450

DESCRIPTION:

1. Changed numbering system for peaking coils with shunt resistors.
2. Changed method of making peaking coil for trigger circuit.

Use a pi winding instead of a flat winding for L246. Part numbers of coils remain unchanged.

Parts Removed:			Parts Added:		
L221 R221	150 μH coil) wound on 1.5 k)	108-0026-00	LR-2 LR-3	150 μH coil 70 μH coil	108-0026-00 108-0027-00
L246 R246	70 μH coil) wound on 4.7 k)	108-0027-00			

POWER SUPPLY RECTIFIER STUD CROSS-THREADING PREVENTED BY CHANGING TO BRASS SCREWS

INFORMATION ONLY

M549

Effective Prod SN not given

DESCRIPTION:

Cross-threading of selenium rectifier studs prevented by changing from aluminum to brass screws.

Parts Removed:			Parts Added:		
Screw,	8-32x2 alum.(2)	no number	Screw,	8-32x2 RHB(2)	no number
Screw,	8-32x2-7/16 " (2)	no number	Screw,	8-32x2-1/4 RHB(3)	no number
Screw,	8-32x2-5/16 "	no number			

VERTICAL AMPLIFIER CONSTRUCTION SIMPLIFIED BY ELIMINATING INSULATED POT MOUNTING

INFORMATION ONLY M563

Effective Prod SN not given

DESCRIPTION:

To simplify construction of Vertical Amplifier, the insulated Bakelite* pot mounting bracket for sensitivity adjust R90, is replaced with an aluminum bracket and shaft coupling.

Parts Removed:		Parts Added:	
Plate, Bakelite	BB315-3	Bracket, alum	406-0021-00
Bar, 1-1/2 x 1/4 alum	PA32-16	Coupling, 7/8 x 1/2	CN28
Coupling, Nat Bakelite	CI32	Nut, 6-32 x 1/4 (2)	210-0407-00
Screw, 6-32 x 5/16 RHB(2)	no number	Lockwasher, int #6 (2)	210-0006-00

REAR PANEL AND FAN RING MADE INTEGRAL PART TO IMPROVE STRENGTH, APPEARANCE AND REDUCE COST

INFORMATION ONLY M564

Effective Prod SN not given

DESCRIPTION:

Fan ring formed into integral part with the rear panel to make fewer parts, and improve strength and appearance.

Part number of rear panel remains unchanged.

Parts Removed:		Parts Added:
Ring, fan	RF315	
Rivet, 1/8 x 1/4 (4)	SR511-2	
Screw, 6-32 x 5/16 BHB(4)	no number	
Nut, 6-32 x 1/4	210-0407-00	
Lockwasher, int #6	210-0006-00	

POWER TRANSFORMER SUPPORT RING THICKNESS INCREASED 1/8" TO INSURE CLEARANCE BETWEEN WINDINGS AND CERAMIC STRIP STUDS

INFORMATION ONLY M589

Effective Prod SN not given

DESCRIPTION:

To insure clearance between the transformer windings and ceramic strip studs,on the High Voltage chassis, the thickness of the transformer ring was increased 1/8". Part number of transformer ring remains unchanged.

*Union Carbide Corp. Registered Trademark

TIME BASE TROUBLE-SHOOTING
TIME DECREASED BY TIGHTENING TOLERANCES IN MULTI CIRCUIT

INFORMATION ONLY

M608

Effective Prod SN 490

DESCRIPTION:

Decrease trouble-shooting time of Time Base circuit by making it possible to adjust the Multi Stability to either of two states. Control the feedback divider closer in tolerance and increase adjustment range of pot by changing it to a larger value.

Parts Removed:			Parts Added:		
R251	150 k 1/2 W 10%	302-0154-00	R251	150 k 1/2 W 1%	309-0049-00
R253	100 k 1/2 W 10%	302-0104-00	R253	95 k 1/2 W 1%	309-0044-00
R254	50 k pot	311-0023-00	R254	100 k pot	311-0026-00

POWER SUPPLY FUSE CHANGED TO 3AG WHICH IS MORE READILY AVAILABLE

INFORMATION ONLY

M599

Effective Prod SN 542

DESCRIPTION:

4AG fuses not readily available at electrical supply houses. Change fuses and fuse holder to 3AG type.

Parts Removed:		Parts Added:	
Holder, fuse 4AG	352-0001-00	Holder, fuse 3AG	352-0002-00
Fuse, 4AG 5A (117 V)	159-0010-00	Fuse, 3AG 5A (117 V)	159-0006-00
Fuse, 4AG 2A (234 V)	no number	Fuse, 3AG 2A (234 V)	159-0023-00

LOWER FRAME BARS INCREASED IN THICKNESS TO PREVENT BENDING OF THE FRONT PANEL TOP FLANGE

INFORMATION ONLY

M580

Effective Prod SN 563

DESCRIPTION:

To support the front end of the instrument solidly in the cabinet and prevent bending of the front panel top flange, the thickness of the members was increased.

Part numbers of bars remain unchanged.

DELAY LINE COIL LEAD SHORTS PREVENTED BY ADDING A CERAMIC POST TO DELAY LINE CHASSIS

INFORMATION ONLY

M649

Effective Prod SN not given

DESCRIPTION:

Shorting of the delay line coil leads is prevented by adding a ceramic post to the inside of the Delay Line chassis to support the input lead from V4.

Parts Removed:		Parts Added:	
Grommet 1/4"	348-0002-00	Post, ceramic	129-0009-00
		Nut, 2-56 x 3/16 (2)	210-0405-00
		Lockwasher ext #2	210-0002-00

VERTICAL AMPLIFIER PARASITIC OSCILLATIONS PREVENTED BY THE ADDITION OF A 47Ω RESISTOR

See SQB

M650

Effective Prod SN 582

Usable in field instruments SN 101-581

DESCRIPTION:

To prevent occasional parasitic oscillation in V3 and V4, replace the ground wire at pin 2 or 9 (grid) of V4 with a 47Ω 1/2W resistor (R39).

Parts Removed:		Parts Added:		
		R39	47Ω 1/2W 10%	302-0471-00

Parts Required for Field Installation:

See 'Parts Added'.

INSTALLATION INSTRUCTIONS:

Replace the ground wire at pins 2 or 9 of V4 with a 47Ω 1/2W resistor (R39).

DELAY LINE TUNING RANGE IMPROVED BY DECREASING THE VALUE OF C502A AND C502B

INFORMATION ONLY

M652

Effective Prod SN 591

DESCRIPTION:

To improve the tuning range of the delay line trimmers. Change C502A and C502B from 5-25 pF to 3-12 pF.

Parts Removed:			Parts Added:		
C502A	5-25 pF	281-0010-00	C502A	3-12 pF	281-0009-00
C502B	5-25 pF	281-0010-00	C502B	3-12 pF	281-0009-00

FAN MOTOR SHOCKMOUNTS CHANGED TO IMPROVE SHOCK CHARACTERISTICS

INFORMATION ONLY

M635

Effective Prod SN 606

DESCRIPTION:

To improve fan motor shock characteristics, change from round type shockmounts to square type.

Parts Removed:		Parts Added:	
Shockmount, round (4)	348-0008-00	Shockmount, square (4)	348-0009-00

FUSE HOLDER CAPS MARKED WITH CURRENT RATING

INFORMATION ONLY

M651

Effective Prod SN not given

DESCRIPTION:

To indicate the proper size fuse to be used in the instrument, the current rating of the fuse is silkscreened on the fuseholder cap.

VERTICAL AMPLIFIER NOMENCLATURE CHANGED TO BE CONSISTENT WITH THE INSTRUCTION MANUAL

INFORMATION ONLY

M669

Effective Prod SN not given

DESCRIPTION:

To provide consistent nomenclature between the instrument and Instruction Manual, change the information for R55 from 'Vert Atten Adj' to 'Vert Amp DC BALANCE'.

HV TRANSFORMER REMOVAL FACILITATED BY USE OF CAPTIVE TYPE NUTS

INFORMATION ONLY

M679

Effective Prod SN 615

DESCRIPTION:

To facilitate the removal and replacement of the High Voltage transformer without removing the High Voltage chassis, change mounting hardware to use 6-32 pem (or captive) nuts.

Parts Removed:		Parts Added:	
Screw, 4-40x3/16 BHB (2)	no number	Screw, 6-32x3/16 BHB (2)	no number
Nut, 4-40x3/16 (2)	210-0406-00	Nut, 6-32 captive (2)	210-0435-00
Lockwasher, int #4 (2)	210-0004-00		

BULKHEAD AND BACK PLATE STRENGTH IMPROVED WITH USE OF STEEL SCREWS

INFORMATION ONLY

M689

Effective Prod SN 625

DESCRIPTION:

Improve strength of mechanical assembly, by mounting back plate to frame bars and bulkhead chassis to back plate with steel screws.

Parts Removed:		Parts Added:	
Screw, 8-32 x 3/8 BHB(4)	no number	Screw, 8-32 x 3/8 BHS	212-0023-00
Screw, 6-32 x 5/16 BHB(2)	no number	Screw, 8-32 x 5/16 BHS	212-0004-00

TIME BASE GEN TIMING ACCURACY AND RELIABILITY IMPROVED BY USE OF MYLAR CAPACITORS IN TIMING CIRCUIT

See SQB

M674

Effective Prod SN 722

Usable in field instruments SN 101-721

DESCRIPTION:

To improve the sweep timing accuracy and reliability, C280A, B and C are replaced with a single unit Mylar* type containing the three capacitors. C280D is also replaced with the Mylar type.

Parts Removed:			Parts Added:		
C280A	1 μF selected	no number	C280A	1 μF)	
C280B	0.1 μF selected	no number	C280B	0.1 μF)	291-0001 00
C280C	0.01 μF selected	no number	C280C	0.01 μF)	
C280D	0.001 μF selected	no number	C280D	0.001 μF	291-0008-00

* Du Pont Registered Trademark

continued

Parts Required for Field Installation:

Parts Replacement Kit 050-0002-00

INSTALLATION INSTRUCTIONS:

Refer to kit instructions for installation procedure.

HIGH VOLTAGE SUPPLY REGULATION MAINTAINED AT HIGH INTENSITY SETTINGS BY CHANGING GRID BIAS SUPPLY DIODE RESISTORS

See SQB M713

Effective Prod SN 753 Usable in field instruments SN 101-752

DESCRIPTION:

Reduce the possibility of the High Voltage supply going out of regulation when the INTENSITY control is increased to its maximum. Change the diode resistors on the grid bias supply.

Parts Removed:			Parts Added:		
R912	5.6 M 2W	306-0565-00	R912	6.8 M 2W	306-0685-00
R913	5.6 M 2W	306-0565-00	R913	6.8 M 2W	306-0685-00

Parts Required for Field Installation:

See 'Parts Added'.

INSTALLATION INSTRUCTIONS:

Replace R912 and R913, 5.6 M 2W resistors (on the Focus and Intensity board at the rear of the CRT), with 6.8 M 2W resistors.

VERTICAL PREAMPLIFIER HUM REDUCED BY MOVING C9 GROUND POINT TO FRONT PANEL GROUND POST

See SQB M762-1

Effective Prod SN 764 Usable in field instruments SN 101-763

DESCRIPTION:

To reduce hum in the Vertical Preamplifier, return the AC ground for V2A grid to the front panel. Ground the 6.25 μF capacitor C9 to the front panel ground post. If your is below SN 346 and has no ground post, install M525.

Parts Removed:		Parts Added:	
		* R26 47Ω 1/2W 10%	302-0470-00
		Post, ceramic 1/2"	129-0009-00

continued

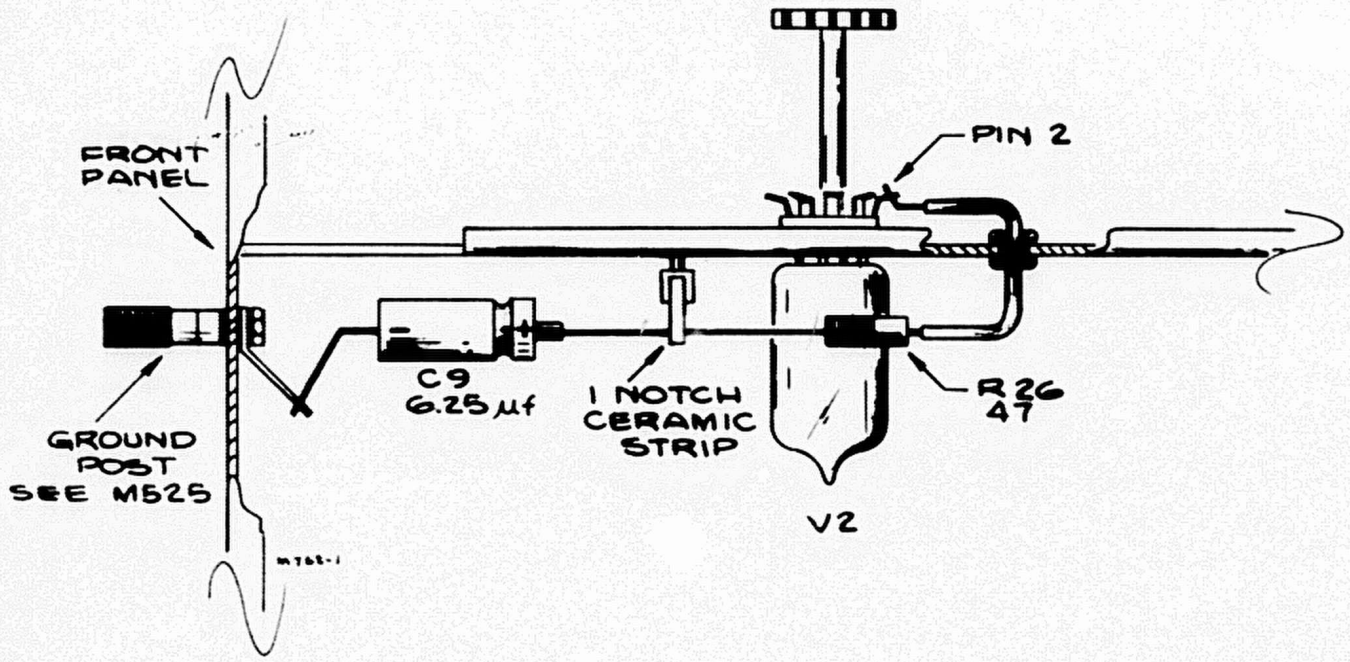
Parts Required for Field Installation:

See 'Parts Added' with asterisks and parts listed below.

Strip, ceramic 1-notch	124-0100-00
Spacer, ceramic strip	361-0007-00
Lug, solder SE10	210-0206-00

INSTALLATION INSTRUCTIONS:

Refer to drawing and rewire C9, (6.25μF) and add R26 (47Ω).



TIME BASE TRIGGER AMPLITUDE DISCRIMINATOR OSCILLATIONS SUPPRESSED BY ADDITION OF 47Ω RESISTOR R207

M762-2

See SQB

Effective Prod SN 764

Usable in field instruments SN 101-763

DESCRIPTION:

Suppress parasitic oscillations in the Trigger Amplitude Discriminator circuit by adding a 47Ω (R207) in V201A grid lead at pin 2.

Parts Removed:

Parts Added:

R207	47Ω 1/2W 10%	302-0470-00

Parts Required for Field Installation:

See 'Parts Added'.

continued

INSTALLATION INSTRUCTIONS:

Replace the wire between pin 2 of V201A and the TRIGGER AMPLITUDE DISCRIMINATOR control with a 47Ω 1/2W resistor (R207).

TIME BASE MULTIPLIER SWITCH RESISTOR R282G CHANGED TO 1 WATT TO REDUCE COST AND IMPROVE APPEARANCE — INFORMATION ONLY — M699

Effective Prod SN 790

DESCRIPTION:

To reduce cost and improve appearance of the TIME BASE MULTIPLIER switch, change R282G from 2 Watt to 1 Watt.

Parts Removed:			Parts Added:		
R282G	18.6M 2W 1%	no number	R282G	18.6M 1W 1%	310-0109-00

FRONT PANEL TITLE AND SERIAL NUMBER MODIFIED FOR CONVENIENCE — INFORMATION ONLY — M700

Effective Prod SN not given

DESCRIPTION:

To place the instrument serial number in a more convenient location, the serial number is moved from the bottom of the front panel to just beneath the instrument type. Also, the instrument title is laid out so that 'special' numbers may be added when necessary.

GRATICULE COVER CHANGED TO CASTING IN ORDER TO SUPPORT A CAMERA — INFORMATION ONLY — M725

Effective Prod SN not given

DESCRIPTION:

To provide a graticule cover on which a viewing hood and camera may be mounted, change the cover from stamped aluminum to cast aluminum.

Parts Removed:			Parts Added:	
Cover,graticule 0.040 alum	no number	Cover,graticule cast	200-0035-00	

POTENTIOMETER EXTENSION SHAFT CONNECTIONS IMPROVED BY USE OF CONNECTOR CLIPS

INFORMATION ONLY

M753

Effective Prod SN not given

DESCRIPTION:

To improve shaft connections to the pots which are mounted on the back of switches, modify the extension shafts and the pot shafts and add a pot connector clip.

Parts Removed:		Parts Added:	
Shaft, SE4-308	384-0015-00	Shaft, SE4-230H	384-0022-00
Shaft, SE4-320	384-0005-00	Shaft, SE4-308H	384-0021-00
Shaft, SE4-604	384-0006-00	Shaft, SE4-529H	384-0023-00
Spacer, switch (4) OAK	#8980		

TIME BASE GEN TUBE RELIABILITY IMPROVED BY ELEVATING FILAMENTS

See SQB

M768

Effective Prod SN 806

Usable in field instruments SN 101-805

DESCRIPTION:

Reduce failure in the following tubes by elevating their filaments to +160 V: V202, V210, V223, V224, V422, and V442.

Parts Removed:		Parts Added:	
		R292 1 M 1/2 W 10%	302-0105-00
		R293 2.7 M 1/2 W 10%	302-0275-00

Parts Required for Field Installation:

See 'Parts Added' and part listed below.

Wire, #22 solid 4-3/4" 175-0522-00
(white-red-red-green)

INSTALLATION INSTRUCTIONS:

a) Remove strap between V442, pins 3 and 8.

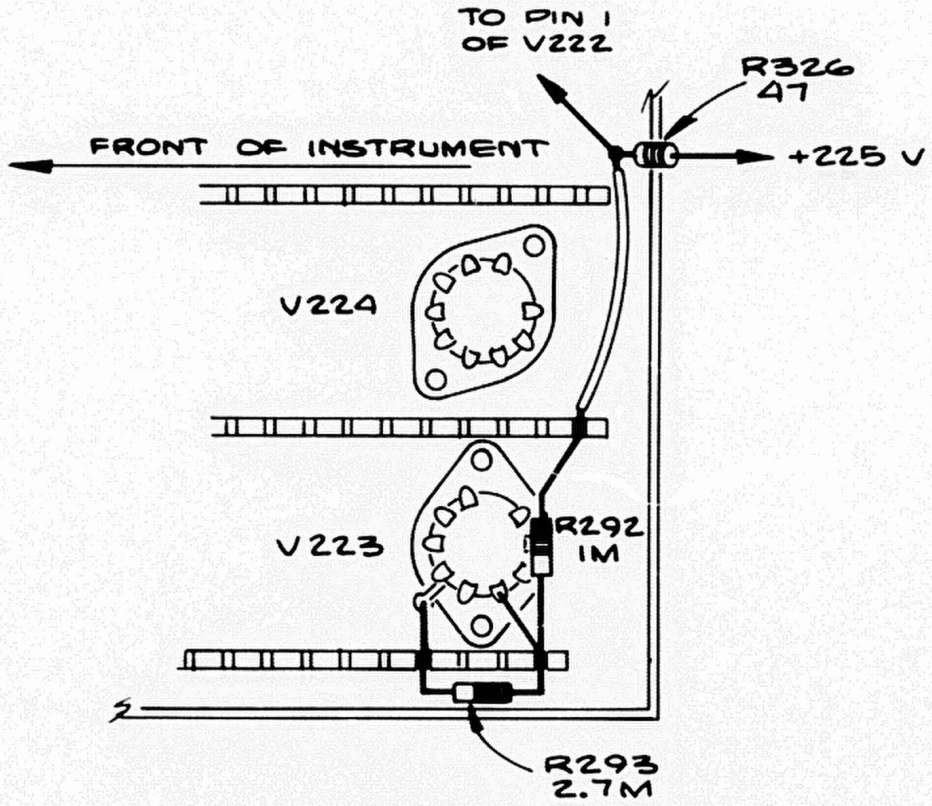
b) Remove strap between V442, pin 8 and 270 k 1/2 W resistor - white-red-red-black wire junction.

c) Add strap between V442 pin 3 and 270 k 1/2 W resistor - white-red-red-black junction.

d) Add R292, 1 M and R293, 2.7 M as shown in drawing on next page.

continued

M768
(cont)



TIME BASE AMPLIFIER

M768

CERAMIC POST AND TURRET STUD REPLACED WITH SPRING PIN FOR ECONOMY

INFORMATION ONLY

M787

Effective Prod SN not given

DESCRIPTION:

To save labor costs, the solid ceramic post and ceramic turret stud is replaced with a spring pin stud.

Parts Removed:		Parts Added:	
Stud, 6-32 x 1/2 (4)	355-0001-00	Pin, spring, Sel-lok (4)	166-0058-00

FRONT SUBPANEL PILOT LIGHT HOLE ENLARGED TO ELIMINATE NEED FOR REAMING

INFORMATION ONLY

M816-2

Effective Prod SN not given

DESCRIPTION:

Eliminate the need to ream the pilot light holes when assembling instrument. Enlarge these holes to 3/4".

VERTICAL OUTPUT AMPLIFIER DC SHIFT COMP RANGE EXTENDED BY CHANGING RESISTOR VALUES

INFORMATION ONLY

M1155

Effective Prod SN 1692

DESCRIPTION:

To extend the range of the DC shift comp control necessitated by a change of 12BY7 vertical tube characteristics, change the value of R86 and R88 from 39 k to 33 k.

Parts Removed:			Parts Added:		
R86	39 k 1/2 W 10%	302-0393-00	R86	33 k 1/2 W 10%	302-0333-00
R88	39 k 1/2 W 10%	302-0393-00	R88	33 k 1/2 W 10%	302-0333-00

TIME BASE AMPLIFIER RESISTOR CHANGED FROM 10W TO 8W TO REDUCE COST

INFORMATION ONLY

M1142

Effective Prod SN 1810

DESCRIPTION:

Dissipation rating of 10 W not needed for R310 and R318 (20 k wire wounds). Change to 8 W to reduce cost.

Parts Removed:			Parts Added:		
R310	20 k 10W	308-0025-00	R310	20 k 8W	308-0011-00
R318	20 k 10W	308-0025-00	R318	20 k 8 W	308-0011-00

TIME BASE GENERATOR TIMING ACCURACY IMPROVED BY CHANGING 0.001 μF CAPACITOR TO MYLAR

INFORMATION ONLY

M1255

Effective Prod SN 1937

DESCRIPTION:

To further improve accuracy and reliability of the sweep timing, change C280D (0.001 μF) to Mylar* type. See M674.

Parts Removed:		Parts Added:	
C280D 0.001 μF select	295-0040-00	C280D 0.001 μF nylon	291-0008-00

* Du Pont Registered Trademark

FRONT PANEL KNOBS CHANGED TO IMPROVE APPEARANCE AND QUALITY AND REDUCE COST

INFORMATION ONLY

M1242

Effective Prod SN 1996

DESCRIPTION:

To improve quality and appearance of the knobs used on front panel controls, Type 310 style knobs are used. The new knobs can be produced faster and more economically.

Parts Removed:		Parts Added:	
Knob, (2)	366-0011-00	Knob, (2)	366-0028-00
Knob, (1)	366-0012-00	Knob, (4)	366-0029-00
Knob, (4)	366-0013-00	Knob, (4)	366-0031-00
Knob, (5)	366-0014-00	Knob, (5)	366-0033-00
Knob, (4)	366-0015-00	Knob, (1)	366-0037-00

VERTICAL AMPLIFIER MULTIPLIER SWITCH CHANGED TO ALLOW USE OF LENGTHENED SHAFT OF 10-1 POT

INFORMATION ONLY

M1263-1

Effective Prod SN 2138
w/exceptions 2057, 2062, 2063, 2065, 2068 and 2069

DESCRIPTION:

The switch mounted pot shafts were lengthened and standardized at 3/8". The following changes were made to the VERTICAL AMPLIFIER MULTIPLIER switch SW2 to accommodate the longer shaft pots:

1. The rear spacers were changed from 21/32" to 3/4".
2. Strut screws were changed from 1-1/8" to 1-1/4" long.

continued

Parts Removed:			Parts Added:		
R54	2250Ω pot 1/4"	311-0009-00	R54		311-0071-00
SW2	Vert Mult	260-0031-00	SW2	Vert Mult	260-0141-00

TIME BASE TRIGGER SELECTOR SWITCH CHANGED TO ALLOW USE OF LENGTHENED SHAFT OF THE STABILITY POTENTIOMETER

See SQB

M1263-2

Effective Prod SN 2192

Usable in field instruments SN 101-2191

DESCRIPTION:

The switch mounted pot shafts were lengthened and standardized at 3/8". The following change were made to the TRIGGER SELECTOR switch to accommodate the longer shaft pots: 1) The outer shaft was shortened from 1/4" to 3/32" beyond the rear wafer; 2) 1/8" inner shaft changed from 3-1/16" to 2-31/32". (Measurements taken from edge of hole to front end of shaft).

NOTE: Parts Replacement Kit 050-0149-00 is available to facilitate installation of 260-0140-00 pre-modified instrument.

Parts Removed:			Parts Added:		
R231	100k pot 1/4"	311-0024-00	R231	100k pot 3/8"	311-0026-00
SW201	SELECTOR	260-0089-00	SW201	SELECTOR	260-0140-00
Shaft	1/8"x3-1/16"	384-0027-00	Shaft	1/8" x 2-31/32"	384-0077-00

TIME BASE MULTIPLIER SWITCH CHANGED TO ALLOW USE OF LENGTHENED SHAFT OF THE 10-1 POTENTIOMETER

INFORMATION ONLY

M1263-3

Effective Prod SN 2212

DESCRIPTION:

The switch mounted pot shafts were lengthened and standardized at 3/8". The following changes were made to the TIME BASE MULTIPLIER switch SW202 to accommodate the longer shaft pots: 1) The outer shaft was shortened from 7/32" to 3/32" beyond the rear wafer; 2) The rear spacer was changed from 21/32" to 3/4"; 3) The 1/8" inner shaft was changed from 3-5/16" to 3-7/32". (Measurements taken from front edge of hole to front end of shaft).

Parts Removed:			Parts Added:		
R283	500k pot 1/8"	311-0036-00	R283	500k pot 3/8"	311-0072-00
SW202	T.B. MULT	260-0087-00	SW202	T.B. MULT	260-0139-00
Shaft, 1/8" x 3-5/16"		384-0076-00	Shaft, 1/8" x 3-7/32		384-0115-00

+100 V AND +350 V SUPPLY ACCURACY INSURED BY CHANGING DIVIDER RESISTORS

See SQB

M1391

Effective Prod SN 2381

Usable in field instruments SN 101-2380

DESCRIPTION:

Improve the accuracy of the +100 V and 350 V supplies by changing R424 from 143 k to 150 k and R467 from 780 k to 800 k. Also, see M1476 for further change in +100 V supply.

Parts Removed:			Parts Added:		
R424	143 k 1/2 W 1%	309-0092-00	R424	150 k 1/2 W 1%	309-0049-00
R467	780 k 1/2 W 1%	309-0011-00	* R467	800 k 1/2 W 1%	309-0110-00

Parts Required for Field Installation:

See 'Parts Added' with asterisks and parts listed below.

R424	220 k 1/2 W 1%	309-0052-00
R425	150 k 1/2 W 1%	309-0049-00

INSTALLATION INSTRUCTIONS:

Change R424 (located over V422 socket) from 143 k to 220 k; R425, (located over V422 socket) from 100 k to 150 k; and R467, (located over V442 socket) from 780 k to 800 k.

POWER SUPPLY THERMAL CUT OUT SWITCH CHANGED TO HIGHER VALUE TO PERMIT OPERATION AT HIGHER AMBIENT TEMPERATURES

INFORMATION ONLY

M1278

Effective Prod SN 2486
w/exception 2473-6 and 2479

DESCRIPTION:

To allow operation of the instrument in an ambient temperature of 110°F, the Thermal Cut-out TK401 was changed from 155° ±5°F to 160° ±5°F.

Parts Removed:			Parts Added:		
TK401	155° ±5°F	260-0071-00	TK401	160° ±5°F	260-0157-00

SCALE ILLUMINATION CIRCUIT CHANGED TO ALLOW COMPLETE EXTINCTION OF LIGHT

See SQB

M1439

Effective Prod SN 2487

Usable in field instruments SN 101-2486

DESCRIPTION:

The Scale Illumination circuit was rewired to allow complete extinction of the bulbs. This is improtant for some photographic applications.

See Before and After schematics.

Parts Removed:

Parts Added:

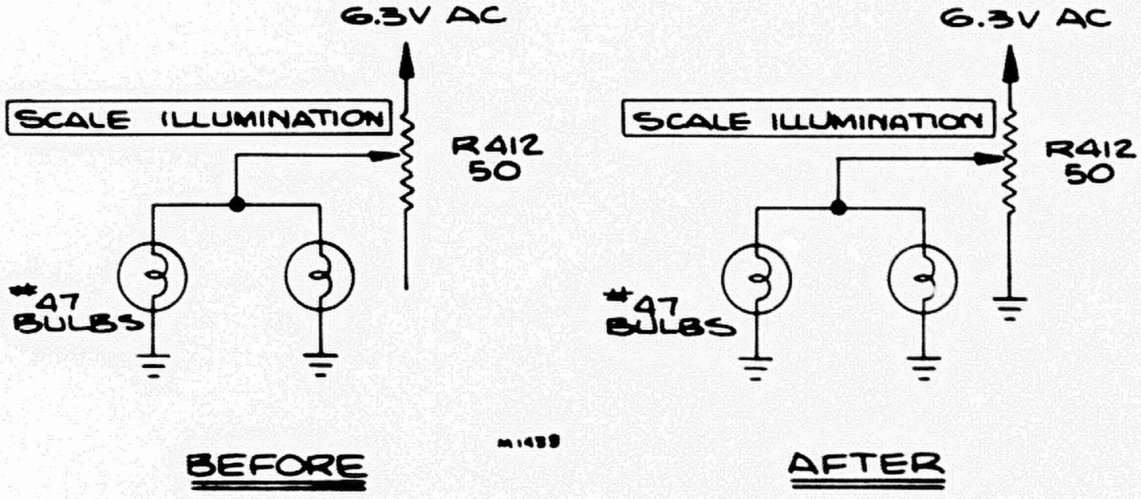
Lockwasher, int 3/8"	210-0012-00
Lug, solder 3/8"	210-0207-00

Parts Required for Field Installation:

See 'Parts Added'.

INSTALLATION INSTRUCTIONS:

Install a 3/8" solder lug and internal lockwasher between the sub-panel and the Scale Illumination potentiometer. Solder the lug to the vacant terminal.



+100 V SUPPLY VOLTAGE BROUGHT WITHIN SPECIFICATION BY CHANGING DIVIDER RESISTOR VALUES

See SQB M1476

Effective Prod SN 2559

Usable in field instruments SN 2381-2558

DESCRIPTION:

The output voltage of the +100 V supply had been consistently running 2 to 4 Volts low. By changing the values of the voltage divider resistor, R424 and R425, the output of the supply was brought within specifications.

For instruments SN 101-2380, See M1391.

Parts Removed:

			Parts Added:		
R424	150 k 1/2 W 1%	309-0049-00	R424	220 k 1/2W 1%	309-0052-00
R425	100 k 1/2 W 1%	309-0045-00	R425	150 k 1/2 W 1%	309-0049-00

Parts Required for Field Installation:

See 'Parts Added'.

INSTALLATION INSTRUCTIONS:

Change the value of R424 from 150 k to 220 k and the value of R425 from 100 k to 150 k. These resistors are located near V422 socket.

TIME BASE RANGE SWITCH WIRING CHANGED TO PREVENT WAVEFORM SHRINKAGE

See SQB M1502

Effective Prod SN 2660

Usable in field instruments SN 101-2659 w/exceptions 2573, 2577, 2579, 2582-3 and 2592

DESCRIPTION:

To overcome shrinkage in the sweep waveform at the fastest sweep range with a free running-untriggered-sweep. The problem was due to inadequate hold off time in the 0.1 MICROSEC position, and was cured by adding a strap between the 1 and 0.1 MICROSEC positions of SW203B.

INSTALLATION INSTRUCTIONS:

Add a wire strap between the 1 and 0.1 MICROSEC positions of the Time Base Range switch SW203B. See schematic on following page.

continued

POWER CORD ATTACHMENT SIMPLIFIED AND IMPROVED BY USE OF STRAIN RELIEF BUSHING

INFORMATION ONLY

M797

Effective Prod SN 1081

DESCRIPTION:

To simplify and improve the power cord attachment, remove the power cord mounting assembly from the frame bracket and install a strain relief bushing.

Parts Removed:		Parts Added:	
Board, BB315-4	386-0279-00	Washer, 5/8 x 1	210-0837-00
Clamp, cable 5/16	343-0004-00	Bushing, strain relief	358-0025-00
Screw, 6-32 x 5/16 BHB	211-0507-00		
Screw, 6-32 x 1/2	211-0511-00		
Lockwasher, int #6 (2)	210-0006-00		
Washer, #6 L (2)	210-0803-00		
Nut, 6-32 x 1/4 (2)	210-0407-00		

POWER SUPPLY SUPPORT BRACKET HOLE ALIGNMENT IMPROVED BY USE OF SLOT HOLES

INFORMATION ONLY

M798

Effective Prod SN 1123

DESCRIPTION:

To improve hole alignment in the Power Supply support bracket, change mounting holes to slots and use a flat washer between the bracket and the lockwasher.

Parts Removed:	Parts Added:	
	Washer, #6L	210-0803-00

FRONT PANEL FUSE RATING REMOVED FROM RACKMOUNT PANEL TO ELIMINATE NEED FOR A SPECIAL 220V PANEL

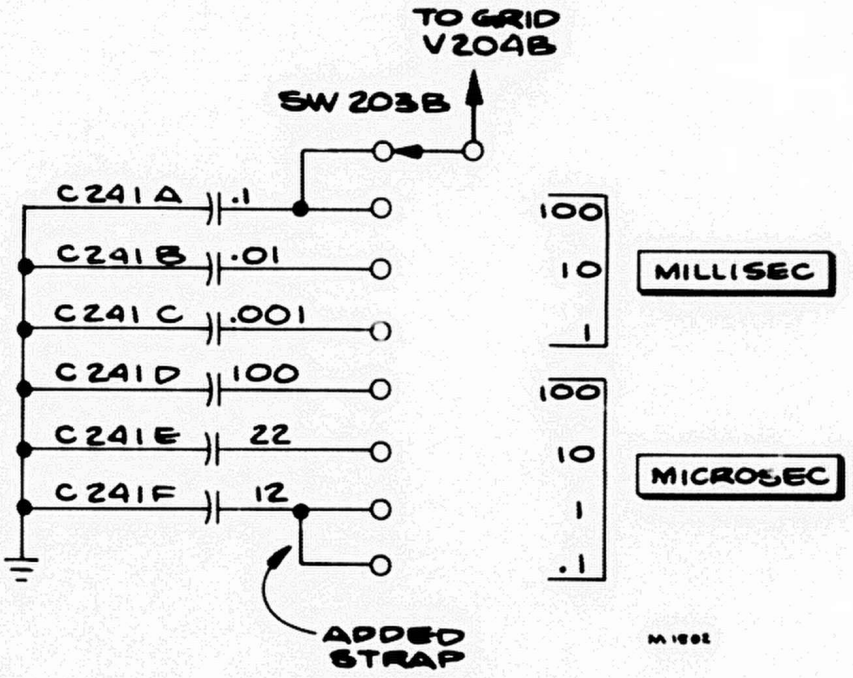
INFORMATION ONLY

M816-1

Effective Prod SN not given

DESCRIPTION:

Eliminate the need for a special 220 V operation panel, by removing the "5A" fuse designation from the rackmount front panel.



DELAY LINE CAPACITOR VALUE CHANGED TO INSURE OPTIMUM SETTING

INFORMATION ONLY

M1507

Effective Prod SN 2608

DESCRIPTION:

To allow optimum setting of C501 Delay Line capacitor, its value was changed from 1.5-7pF to 3-12pF.

Parts Removed:			Parts Added:		
C501	1.5-7pF	281-0006-00	C501	3-12pF	281-0009-00

GRATICULE STUDS CHANGED TO FACILITATE REPLACEMENT

INFORMATION ONLY

M1570

Effective Prod SN not given

DESCRIPTION:

To facilitate the replacement of damaged or corroded graticule studs, without removing the instrument front and subpanel, a new graticule stud was designed which can be mounted with a 10-32 x 3/8" screw instead of having to be crimped on.

Parts Removed:		Parts Added:	
Stud, graticule (4)	no number	Stud, graticule 10-32 thread (4)	355-0043-00
		Screw, 10-32 x 3/8"	212-0507-00

DF:CH:fb

file 040-007

Type 315A

date October 8, 1953

FIELD MODIFICATION KIT

TEKTRONIX, INC.

FIELD MODIFICATION 315 - 540

K315AE INSTALLATION INSTRUCTIONS

1. Replace the two 10 watt, 2.5K ohm plate load resistors (R80 and R84) with the two 10 watt, 2.7K ohm resistors furnished with the kit.

2. Drill a hole for a 6-32 machine screw (#27 drill) through the Vertical amplifier chassis at a point (between tube socket V13 and the inboard lip of the VA Chassis) midway between the screws supporting L6 and L7. Be especially careful when drilling not to drill through into a cable of wires passing under this point.

3. Put a 5/16" X 6-32 fillister head machine screw through the hole (drilled in step #2) with the head projecting toward the top of the scope; place over the screw a 6-32 outside-star lockwasher and screw on the bakelite stand-off post tightly.

4. Place [illegible] the other outside-star lockwasher.

5. Put a 5/16" X 6-32 [illegible] head screw [illegible] the hole (in the D.C. [illegible] assembly) which is located halfway between the two [illegible] the [illegible] of the screw should be on the [illegible] side of the bracket which [illegible]. The [illegible] with the bracket assembly extending over the CRT socket [illegible] " X ¼" aluminum scope frame rod, start the screw into the [illegible] stand-off post.

6. This step involves drilling and countersinking holes through the [illegible] ¼" X 1" aluminum scope frame rod to support the [illegible] end of the bracket assembly. These holes should be made [illegible] #27 drill for the two 5/8" X 6-32 Flat-head screws furnished and should be spaced 1 3/8" apart between centers to match the holes already drilled in the out-board edge of the bracket. The holes should be drilled in a place where, when the bracket is mounted, it will be square with the scope frame. After drilling the holes countersink the tops of the holes with an 82° countersink to a depth sufficient to allow the tops of the flat head screws to be flush with the surface of the rod.

7. Fasten the bracket to the scope frame rod using the flat head screws, lockwashers and nuts.

8. Solder the brown-black wire from the bracket assembly to pin 9 of V13.

9. Solder on 33K, $\frac{1}{2}$ watt resistor (R86 or R88) to the top terminal of L6 and solder the other 33K resistor to the top terminal of L7.

10. With the scope thoroughly warmed up apply the Cal voltage to the input terminal. Set sensitivity to .1 volt per division DC and set Cal voltage at 1 volt. Adjust the vertical positioning until the bottom edges of the signal displayed follow the centerline. Then, switching the Cal alternately between off and 1 volt, adjust the D.C. Shift Comp. Control (R87) until the undeflected sweep (occurring when the Cal if off) coincides with the position of the bottom extreter of the signal displayed.

file 040-008
Type 315D

date January 18, 1957

FIELD MODIFICATION KIT

INSTRUCTIONS FOR INSTALLING PTM MODIFICATION

Type 315D Oscilloscope

1. Kit list consists of:
   - 1 - 47 ohm, 1/2W, Comp., 10%, Resistor
   - 1 - 4.7 K ohm, 1/2W, Comp., 10%, Resistor
   - 1 - 0.001 Mfd., PTM, 600V, 20%, Capacitor
   - 1 - Single pole - Single throw switch
   - 1 - Aluminum tab panel marked PTM - Normal
   - 1 - 12" Orange, green, brown wire, #20
   - 1 - 12" Red, white wire, #20

2. Drill a $\frac{1}{2}$ inch hole through the panel and subpanel, located 3-1/32 inches from the left side of the scope and $1\frac{1}{2}$ inch from the bottom.

3. Install the SPST Switch with the contacts toward the bottom of the Scope. Place the aluminum tab next to the panel, over the switch, screw on nut and tighten.

4. Solder the 4.7K Resistor across the Switch contacts. Remove the 47 ohm Resistor (R221), located between the ceramic terminal strips in terminals 7, from the front. Remove jumper between outside terminal 7 and trigger selector switch contact.

5. Solder the 47 ohm Resistor, supplied in Kit, between the inside terminal 7 and the Switch contact.

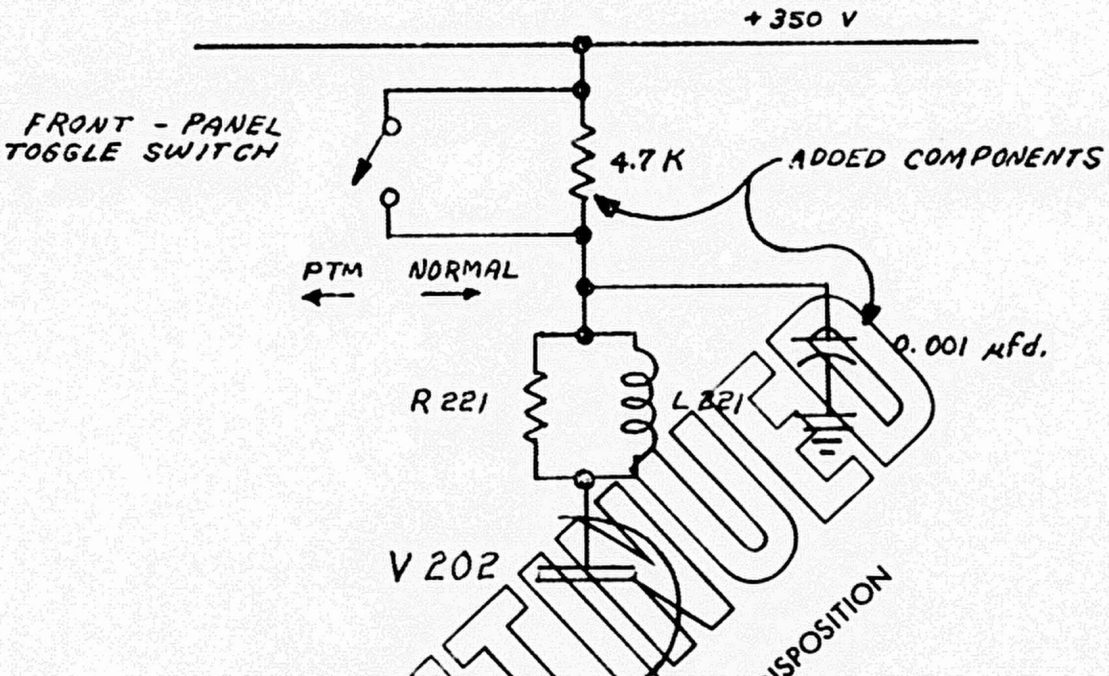
6. Move from terminal 8 to terminal 7: (1) jumper going to pin 3 of V202, (2) orange, green, brown lead, (3) 0.01 Mfd., 600V, Capacitor.

7. Solder an orange, green, brown lead from one side of installed SPST switch to +350 Volt contact located on outside of trigger selector switch.

8. Solder a red, white lead from the other side of the installed SPST switch to the outside terminal 8 - one side of R221, L221.

9. Solder the 0.001 Mfd., 600V, Capacitor from the outside terminal 8 to any ground lug.

10. If desired, correct the schematic.



DISCONTINUED

SEE NUMERICAL PARTS RECORD (NPR) FOR DISPOSITION

040-009

Type 315D

August 20, 1956

FIELD MODIFICATION KIT

INSTRUCTION SHEET

Subject: Converting Type 315D's from 50-400 cps AC Power to 50-60 cps

Kit: MK-15 Tek No. 040-009

This kit enables the owner of a 315D to take advantage of the higher efficiency and quieter operation that a shaded pole induction motor provides over a 65 volt DC motor and its associated rectifier.

KIT LIST

		Tek Nos.
1 ea.	315 AC motor assembly consisting of:	
1 ea.	MTR34 Motor	147-001
1 ea.	#9721-1, 4-pin plug	134-009
1 ea.	BR315-6 Plate mounting	386-307
1 ea.	BS315-13 Motor spacer	406-100
1 ea.	8-32 x 2-1/4" RHS screw	212-014
2 ea.	6-32 x 3/8" spade bolt	214-012
1 ea.	8-32 x 5/16" nuts	210-409
1 ea.	#8 Int. lockwasher	210-008
4 ea.	6-32 x 1/4" nuts	210-407
1 ea.	55-5C Fan blade	369-001
20 ins.	4-111 #18 wire color-coded yellow-brown-white	
4 ea.	#8 Int. lockwasher	210-008
4 ea.	8-32 x 5/16" nuts	210-409

The following detailed information outlines the method of using a MS15 Kit to replace the DC motor and its rectifier with a 50-60 cps shaded-pole induction motor.

SERIAL NUMBER QUALIFICATIONS

1. Instruments with Serial Numbers below 135, except 129, 132 and 133, do not require conversion unless they have been returned to the factory for a DC fan motor conversion.

Serial Numbers from 129 through 149 (except 130, 131 and 134).

1. Remove the fan blade by loosening the set screw.
2. Remove the four nuts from the machine screws fastening the motor bracket.
3. Clip the two leads feeding the DC motor from terminals 14 and 17 on the power transformer.
4. Remove the DC motor assembly from the oscilloscope.
5. A. Clip the male socket from the AC motor leads.

   B. Solder two lengths of wire (10") to power connections of the AC motor; tape these connections.*
6. Install AC motor assembly and run wires through grommet down to power transformer. Connect the leads to terminals 1 and 3 on the power transformer.

*Note: If the instrument was modified previously to convert it from 50-60 cps operation to 400-800 cps operation, the old wires may yet be in place with taped ends. The need for new wires, Item 5, will depend on the length of the old wires.

7. Replace the fan blade and tighten set-screw.

Serial Numbers from 150 through 187.

1. Same as 1 above.
2. Same as 2 above.
3. Disconnect the two wires (color-coded green) which are connected to selenium rectifier and tape the ends.
4. Same as 4 above.
5. Install AC motor assembly in scope.
6. Untape the ends of the two wires (color-coded green) which are taped to the green wires, and solder to the motor leads. Tape these joints.
7. Same as 7 above.

Serial Numbers 188 and higher.

1. Same as 1 above.
2. Same as 2 above.
3. Unplug the DC motor.
4. Same as 4 above.
5. Plug in the AC motor.
6. Mount the AC motor assembly in the scope.
7. Same as 7 above.

file 040-010
Type 315D

date July 23, 1956

FIELD MODIFICATION KIT

INSTRUCTION SHEET

Subject: Converting Type 315D's from 50-60 cps AC Power to 50-800 cps.

All Type 315D Oscilloscopes could be used on any AC power line frequency between 50 and 800 cps were it not for the limitations imposed by the ventilating fan motor.

For this reason, two different ventilating fan motors are used in Type 315D scopes -- one, a shaded-pole induction motor for 50-60 cps operation; the other, a 65 volt DC motor. Power for the DC motor is obtained from a special 37.5 volt (RMS) secondary winding on the transformer through a bridge-connected selenium rectifier. (Note that the DC voltage supplied to the motor is less than 65 volts -- this to reduce the speed of the fan with a corresponding reduction of noise and vibration.)

Due to the presence of brushes, the DC motor will probably require more maintenance and attention than the AC shaded-pole motor. However, it is a necessary compromise to enable the use of a Type 315D on all power line frequencies between 50 and 800 cps.

The following detailed information outlines the method of using a kit, MK-15 to replace the 50-60 cps induction motor with a DC fan motor suitable for use with all line frequencies between 50 and 800 cps.

An MK-15 kit consists of a DC motor and a bridge-connected selenium rectifier mounted on a support bracket plus the necessary mounting hardware. (See the attached schematic). Depending upon the serial number of the Type 315D, the steps involved are as follows:

SERIAL NUMBERS BELOW 135 (Except #129, 132, and 133):

1. Kit MK-15 cannot be used to convert any Type 315D with serial numbers below 135 except #129, 132, and 133.

2. Instruments with serial numbers below 135 can probably be converted at the factory and correspondence is invited if any customer wishes the conversion made.

SERIAL NUMBERS FROM 135 THROUGH 149 (INCLUDING #129, 132, and 133):

1. Remove the fan blade;
2. Remove the four nuts from the machine screws fastening the AC motor bracket;
3. Clip the old AC motor leads and permanently tape up each of them;
4. Remove the whole AC motor assembly;
5. On the DC motor assembly, unsolder and remove the two power input wires. (Do not disturb the wiring between the selenium rectifier and the DC motor).
6. Solder two new leads, each about 14" long, to the terminals of the selenium rectifier that were bared in 5. above,
7. Mount the DC motor assembly in the scope;
8. Run the two leads down to the 37.5 volts (MS) winding of the transformer -- terminals 14 and 17;
9. Replace the fan blade and tighten setscrew.

SERIAL NUMBERS FROM 150 THROUGH 187:

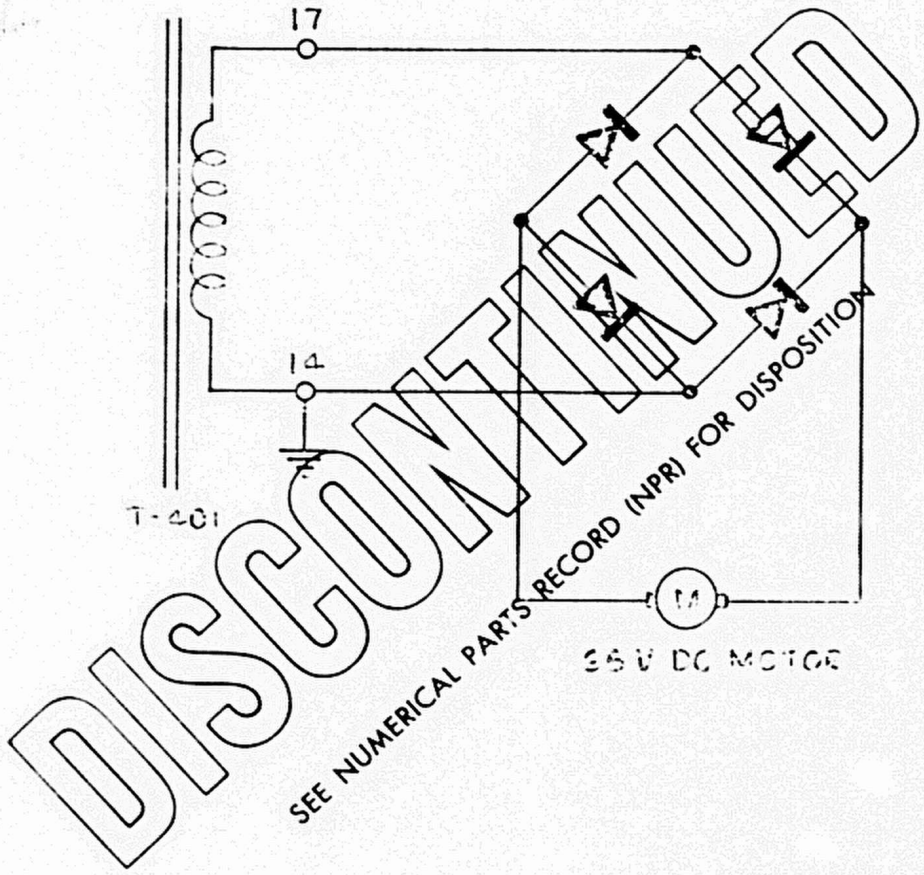
1. Remove the fan blade;
2. Remove the four nuts from the machine screws fastening the AC motor bracket;
3. Clip the old AC motor leads (color coded gray) and permanently tape up each of them;
4. Remove the whole AC motor assembly;
5. On the DC motor assembly, unsolder and remove the two power input wires. (Do not disturb the wiring between the selenium rectifier and the DC motor).
6. In the scope, untape the two wires (color coded green) which were taped to the gray AC wires;
7. Mount the DC motor assembly in the scope;
8. Solder the two wires (color coded green) to the selenium rectifier terminals that were bared in 5. above;
9. Replace the fan blade and tighten setscrew.

SERIAL NUMBERS 188 AND HIGHER:

1. Remove the fan blade;
2. Remove the four nuts from the machine screws fastening the AC motor bracket;
3. Unplug the old motor;
4. Remove the whole motor assembly;
5. Plug in the new DC motor,
6. Mount the DC motor assembly in the scope;
7. Replace the fan blade and tighten setscrew.

Kit, [illegible]-15, is available from the factory at a price of $22.50, with transportation charges prepaid to destination by surface carrier.

Schematic of DC fan motor and selenium rectifier assembly used in TEKTRONIX Type 315D Oscilloscopes:



product modification

040-0220-00

Type 315D

SILICON RECTIFIER

For TEKTRONIX® Type 315D Oscilloscopes

All Serial Numbers

Modification Kit, PN 040-0220-00, replaces the following selenium rectifiers used in the TEKTRONIX Type 315D Oscilloscope with silicon rectifiers, offering more reliability and longer life:

SR401A, B	PN 106-0003-00
SR420	PN 106-0004-00
SR440	PN 106-0017-00
SR460	PN 106-0005-00

4-6-70

Supersedes: September 1967

PARTS INCLUDED IN MODIFICATION KIT

Quantity (1 ea)	Part Number	Description
		Assembly, silicon rectifier, consisting of:
4 ea	124-0091-00	Strip, cer, 3/4 x 11 notches, clip-mounted
12 ea	152-0066-00	Diode, silicon, 500-750mA 400PIV
4 ea	152-0040-00	Diode, silicon, 500mA 600PIV
1 ea	210-0204-00	Lug, solder, DE6
1 ea	210-0407-00	Nut, hex, 6-32 x 1/4
3 ea	210-0478-00	Nut, resistor mounting
3 ea	210-0601-00	Eyelet, resistor mounting
1 ea	211-0504-00	Screw, 6-32 x 1/4 PHS, Phillips
3 ea	211-0507-00	Screw, 6-32 x 5/16 PHS, Phillips
3 ea	211-0553-00	Screw, 6-32 x 1-1/2 RHS, Phillips
1 ea	308-0012-00	Resistor, WW, 40Ω 10W
1 ea	308-0151-00	Resistor, WW, 25Ω 10W
1 ea	308-0153-00	Resistor, WW, 100Ω 10W
8 ea	361-0007-00	Spacer, nylon molded, 0.063
1 ea	387-0018-00	Plate, silicon rectifier subpanel
1 ea	(162-0504-00)	Tubing, plastic, #20 7/8 in. black
1 ea	(175-0514-00)	Wire, #22 solid, 5-1/2 in. black-brown-green-brown
1 ea	(175-0514-00)	Wire, #22 solid, 6 in. black-brown-green-brown
1 ea	(175-0522-00)	Wire, #22 solid, 3-1/2 in. white-black
1 ea	(175-0522-00)	Wire, #22 solid, 3-1/2 in. white
1 ea	166-0030-00	Spacer, aluminum, 0.180 x 1/4 x 3/16
1 ea	166-0033-00	Spacer, aluminum, 0.180 x 1/4 x 3/8
1 ea	210-0457-00	Nut, Keps, 6-32 x 5/16
2 ea	210-0803-00	Washer, flat, 6L x 3/8
1 ea	211-0511-00	Screw, 6-32 x 1/2 PHS, Phillips
1 ea	211-0516-00	Screw, 6-32 x 7/8 PHS, Phillips
1 ea	214-0210-00	Spool, w/3 ft. silver-bearing solder
1 ea	308-0068-00	Resistor, WW, 2.4k 20W
1 ea	308-0190-00	Resistor, WW, 1.8k 25W
1 ea	343-0002-00	Clamp, cable, 3/16

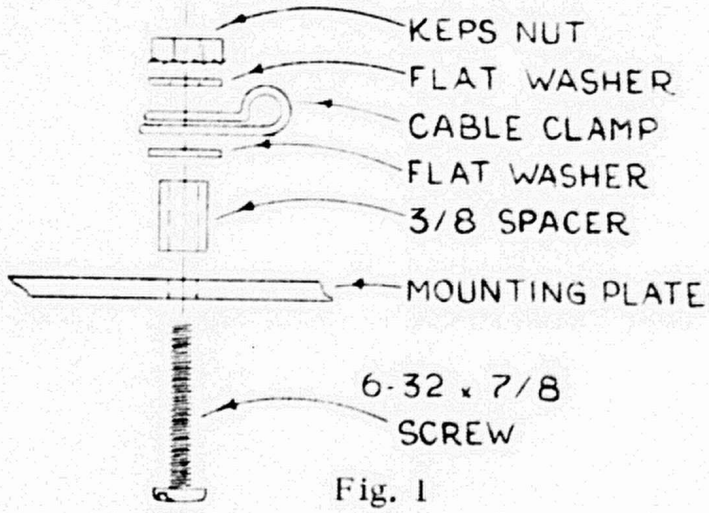


Fig. 1

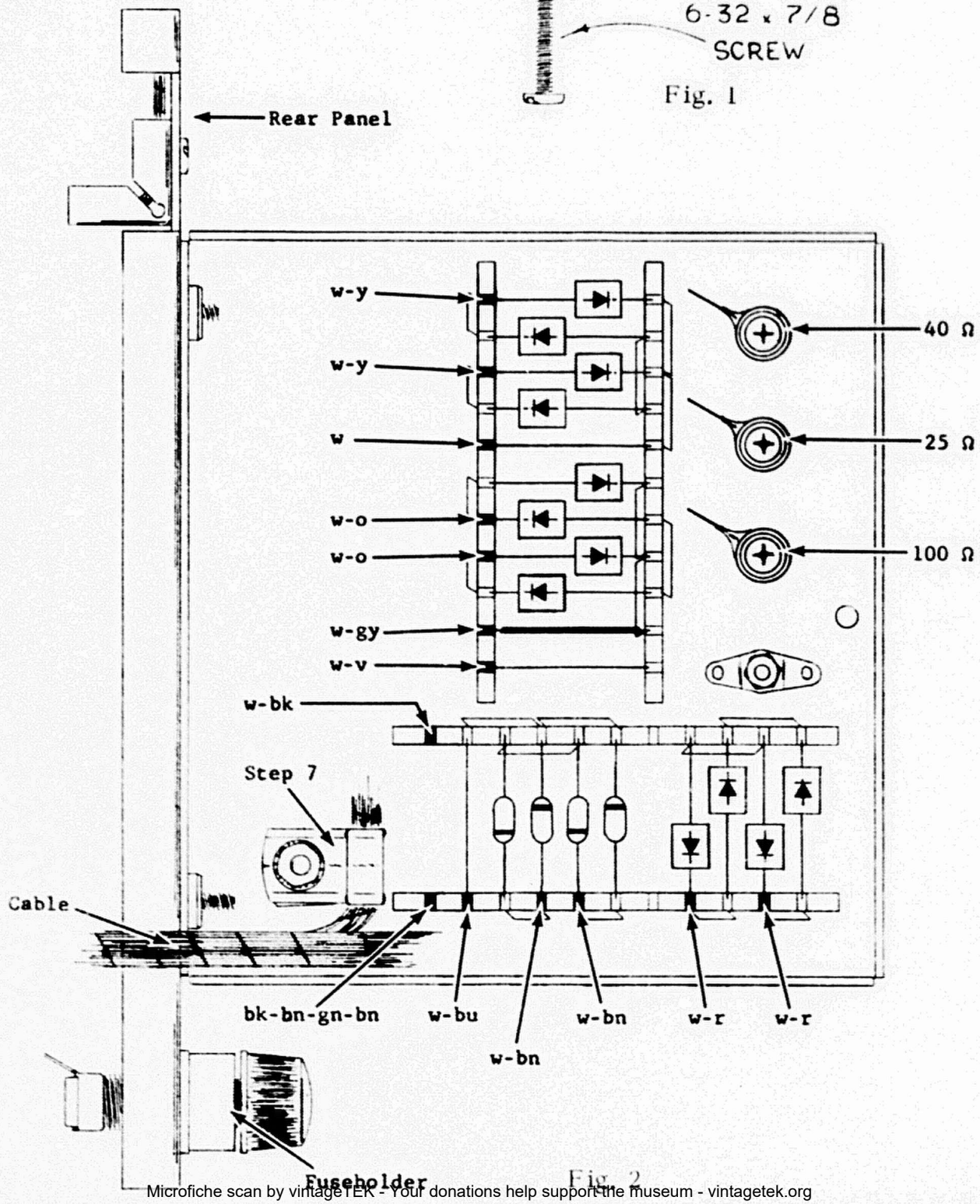


Fig. 2

INSTRUCTIONS

IMPORTANT: When soldering to the ceramic strips, use the silver-bearing solder supplied with this kit.

( ) 1. Remove the selenium rectifier mounting plate from the instrument.

( ) 2. Unsolder all wires to the selenium rectifiers.

( ) 3. Temporarily mount the silicon rectifier assembly on the back panel of the instrument (as shown in Fig. 2) with the two 6-32 x 5/16 screws from the kit.

( ) 4. Carefully cut the lacing on the two sections of cable back to the point where they join together.

( ) 5. Dress the cable towards the bottom ceramic strip as in Fig. 2.

( ) 6. Place the following eight wires from the cable through the cable clamp from the kit:

(2) white-yellow	white-gray
white	white-violet
(2) white-orange	white-black

( ) 7. Dress the above wires upward and mount the cable clamp, as shown in Fig. 2, step 7. Use the hardware (from kit) shown in Fig. 1.

( ) 8. Dress the remaining six wires from the cable beneath the bottom ceramic strip.

( ) 9. Solder the wires to the ceramic strips, as shown in Fig. 2.

( ) 10. Locate R443 and R465 (top of instrument, at rear). Replace them with the resistors (from kit) indicated below. Use the old mounting hardware.

( ) R443 -- replace the 3.5k 20W WW resistor with the 2.4k 20W WW resistor.

( ) R465 -- replace the 1.5k 25W WW resistor with the 1.8k 25W WW resistor.

( ) 11. Check for wiring errors. Turn the instrument on and check for proper operation of the power supply.

NOTE: If adjustments are made to the power supply, it will be necessary to check the calibration of the rest of the instrument.

( ) 12. Remove the silicon rectifier assembly from its temporary position and mount it in the same place as the old selenium rectifier assembly.

( ) Fasten the assembly to the rear panel with the 6-32 x 5/16 screws used in step 3.

( ) Fasten the assembly to the support post with the 6-32 x 1/2 screw from the kit.

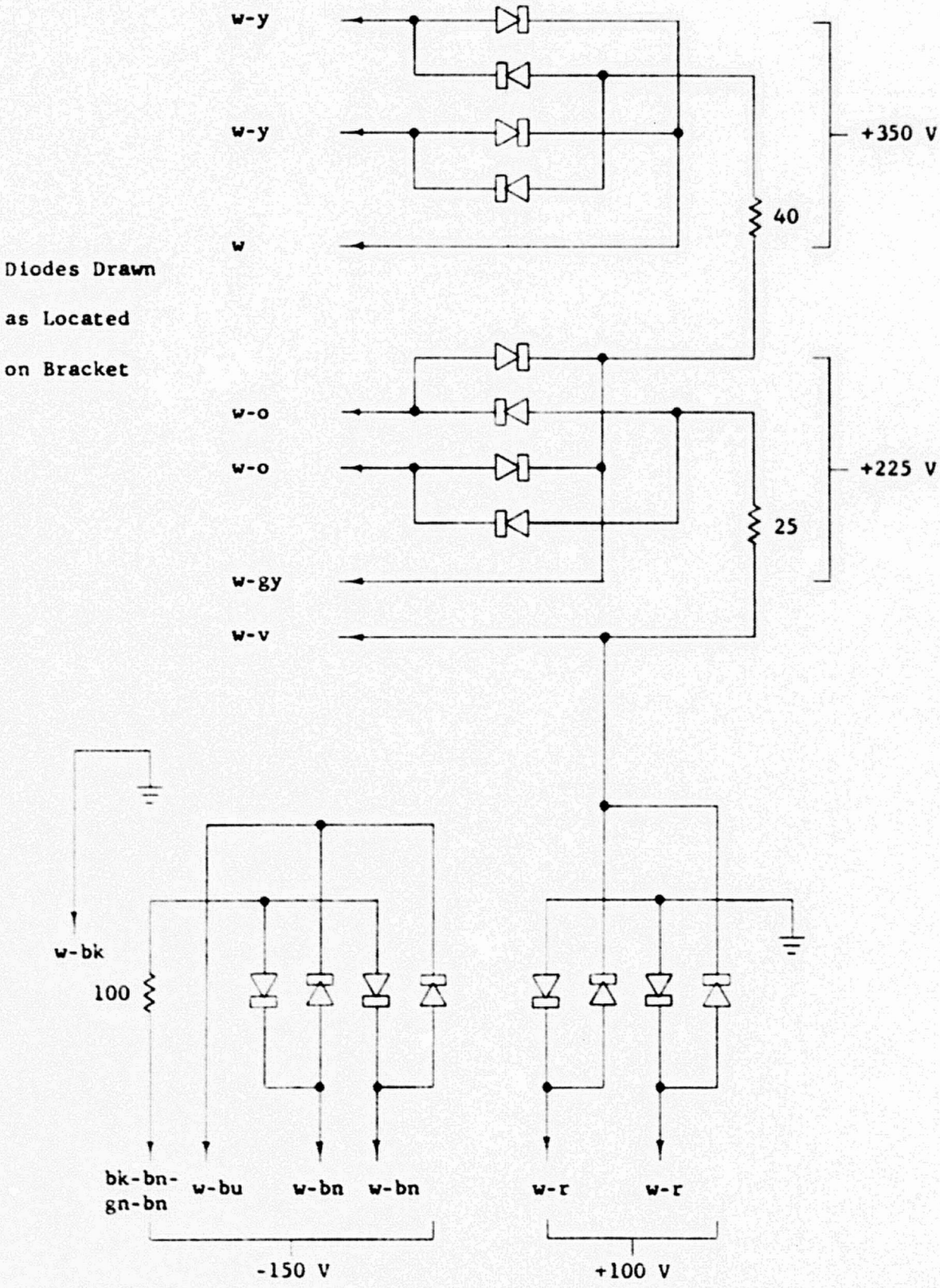
NOTE: On some instruments it will be necessary to place a 3/16 spacer (from kit) between the assembly and support post.

THIS COMPLETES THE INSTALLATION

( ) Insert the Manual Parts List and Schematic in your Instruction Manual.

JT:ls

BRACKET WIRING



INSTRUCTION
MANUAL

MODIFICATION INSERT

SILICON RECTIFIER

Type 315 -- All Serial Numbers

Installed in Type 315 SN_____Date_____

This insert has been written to supplement the Instruction Manual for this instrument. The information given in this insert will supersede that given in the manual.

GENERAL INFORMATION

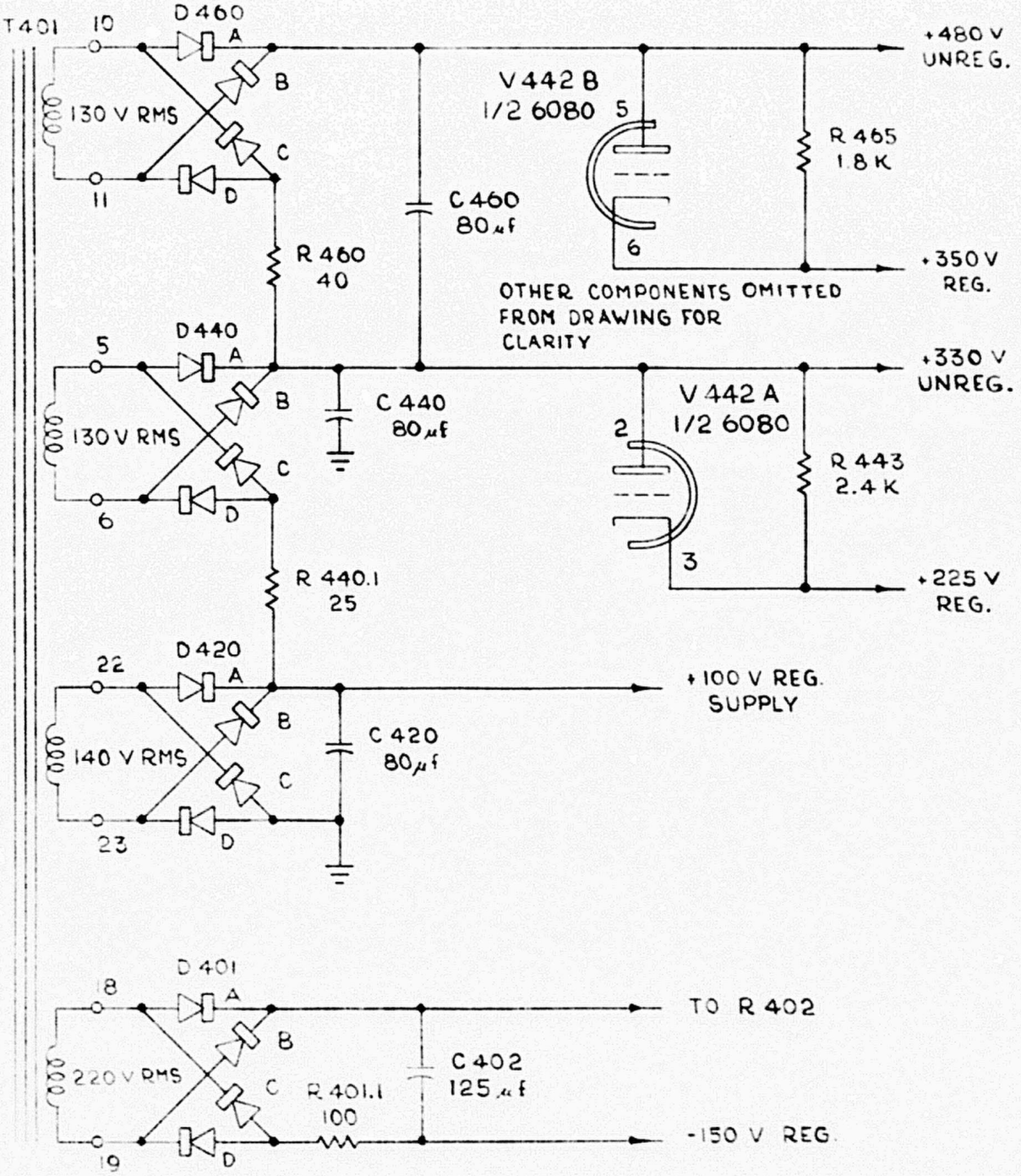
Modification Kit, PN 040-0220-00, replaces the selenium recitifiers used in the Tektronix Type 315 Oscilloscope with silicon rectifiers, offering more reliability and longer life.

ELECTRICAL PARTS LIST

Values fixed unless marked variable. Only new parts listed.

Ckt.No.	Part Number	Description			
		DIODES			
D401A,B,C,d(4)	152-0040-00	500mA	silicon		600PIV
D420A,B,C,D(4)	152-0066-00	500-750mA	silicon		400PIV
D440A,B,C,D(4)	152-0066-00	500-750mA	silicon		400PIV
D460A,B,C,D(4)	152-0066-00	500-750mA	silicon		400PIV
		RESISTORS			
R401.1	308-0153-00	100Ω	10W	WW	5%
R440.1	308-0151-00	25Ω	10W	WW	5%
R443	308-0068-00	2.4k	20W	WW	5%
R460	308-0012-00	40Ω	10W	WW	5%
R465	308-0190-00	1.8k	25W	WW	5%

SCHEMATIC



PARTS REPLACEMENT KIT

MYLAR TIMING CAPACITORS

For Tektronix Type 315 Oscilloscopes:
Serial numbers 101-721

DESCRIPTION

Mylar* timing capacitors 291-0001-00 and 291-0008-00 replace 295-0033-00 (Timing Series 7).

These new Mylar timing capacitors replace the former PMC and PTM timing capacitors, resulting in improved accuracy of sweep timing and linearity, plus extended capacitor life.

NOTE: If the serial number of your instrument is above those listed, or if this kit has been installed, disregard the instructions as P/N's 291-0001-00 and 291-0008-00 are direct replacements.

050-0002-00

Publication:
Instructions for 050-0002-00
March 1966

Supersedes:
September 1963

*Du Pont registered trademark.

PARTS LIST

Qty.	Part Number	Description		
1 ea	210-0006-00	Lockwasher, int. #6		
1 ea	210-0202-00	Lug, solder, SE6		
2 ea	210-0407-00	Nut, hex, 6-32 x 1/4		
1 ea	291-0001-00	Capacitor, Mylar timing,	1 x 0.1 x 0.01 μF	
1 ea	291-0008-00	Capacitor, Mylar timing,	0.001 μF	±1/2%
1 ea	(175-0510-00)	Wire, #20 solid,	5-1/4 in.	white-green
1 ea	(175-0510-00)	Wire, #20 solid,	5 in.	white-orange

INSTRUCTIONS

( ) 1. Remove C280A (1 μF capacitor) mounted on the sweep chassis, inward from V204 and V211.

( ) 2. Mount new Mylar timing capacitor, 291-0001-00 (common terminal toward front of instrument) in the position vacated by the old 1 μF capacitor. It will be necessary to enlarge the mounting holes, using a rat-tail file.

( ) 3. Remove the 0.1 μF, 0.001 μF, and 0.001 μF timing capacitors from the SWEEP RANGE switch, noting their respective positions on the switch.

( ) 4. Remove the remaining 82 pF capacitor, which is mounted in parallel with C280E trimmer, and replace it on the two adjacent contacts upwards of its original position.

NOTE: This is a physical location change only.

NOTE: The following method is used to identify the RANGE SWITCH terminals:

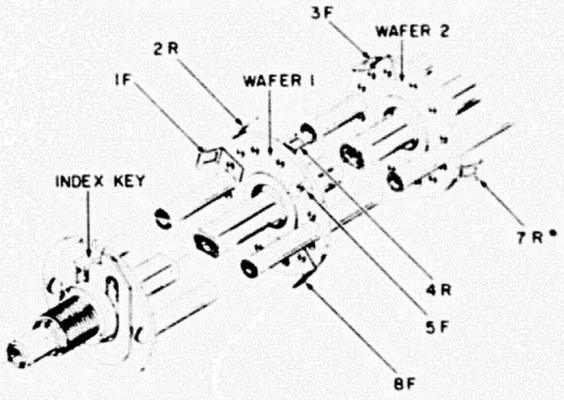
Wafers are numbered from front to rear.

Contact positions are numbered 1 through 12 relative to the index key as shown in drawing.

Contacts have an 'F' or 'R' suffix which denotes that they are on the front or rear of the wafer.

Example: W2-7R (denoted by * on drawing) is contact #7 on the rear of wafer 2.

(TYPICAL SWITCH CONFIGURATION)



( ) 5. Solder wire, originally connected to rear terminal of old 1 μF capacitor (removed in step 1), to "C" terminal on new timing capacitor. Other end is soldered to W3-5R and 6R.

( ) 6. Solder wire, originally connected to front terminal of old 1 μF capacitor (removed in step 1), to 1 μF terminal on new timing capacitor. Other end is soldered to W4-5R and 6R.

( ) 7. Solder the 5 in. white-orange wire (from kit) to contact W4-7R and dress it through grommet to the 0.1 μF terminal on new timing capacitor.

INSTRUCTIONS (cont)

( ) 8. Solder the 5-1/4 in. white-green wire (from kit) to contact W4-8R and dress it through grommet to the 0.01 μF terminal on new timing capacitor.

( ) 9. Observe the shorting strap connecting contacts W3-5R and W3-6R. Solder another strap from W3-6R to 7R and 8R to make the four contacts a common point.

( ) 10. Install new 0.001 μF Mylar capacitor (from kit) in the position previously occupied by the old 0.001 μF capacitor, between contacts W3-9R and W4-9R.

THIS COMPLETES THE INSTALLATION.

( ) Recheck your work.

( ) Correct your Instruction Manual as required.

( ) Refer to your Instruction Manual and recalibrate your instrument as required.

GG:eet

PARTS REPLACEMENT KIT

CRT CONVERSION (T3100_)

DISCONTINUED

SEE NUMERICAL PARTS RECORD (NPR) FOR DISPOSITION

050-141

For the following Tektronix Oscilloscopes:

Type 315D serial numbers 101-up
Type 360 serial numbers 101-2576

DESCRIPTION

The Type 3WP_ CRT used in the Types 315D and 360 Oscilloscopes is replaced by a Type T3100_ CRT. Replacement of CRT socket 136-023 by 136-081 is required to install the new CRT.

Four of the binding head screws used in the Type 315D CRT shield are replaced with flat head screws to allow clearance for the new T3100_ CRT's.

This kit does not include the CRT.

Publication:
Instructions for 050-141
June 1964

PARTS LIST

Quantity	Description	Part Number
1 ea.	Socket, tube, CRT	136-081
4 ea.	Screw, 6-32 x 3/8 FHS 100° Phillips	211-559

INSTRUCTIONS

A. FOR TYPE 315D INSTRUMENTS:

1. Remove the following from the instrument:

( ) the cathode ray tube (CRT).

( ) the HV shield (337-016) from the top rear, left side of the instrument.

( ) the DC Shift Comp bracket over the rear of the CRT shield. NOTE: Position the bracket up and toward the opposite side of the instrument.

( ) 2. Unsolder the CRT socket leads, noting their locations in respect to color-code.

( ) 3. Replace the four CRT shield mounting screws, indicated in the drawing, with the four flat head screws from the kit.

( ) 4. Cut the leads of the new socket to match those on the old socket. NOTE: The new socket has a white-red lead in place of one of the two brown filament leads on the old socket.

( ) 5. Install the new CRT socket in the instrument.

( ) 6. Replace the DC Shift Comp bracket and HV shield previously removed.

( ) 7. Install the CRT.

THIS COMPLETES THE INSTALLATION FOR THE TYPE 315D INSTRUMENTS.

( ) Check wiring for accuracy.

B. FOR TYPE 360 INSTRUMENTS:

1. Remove the following from the instrument:

( ) the cathode ray tube.

( ) the two HV shields.

( ) the CRT socket leads, noting their locations in respect to color-code.

( ) 2. Cut the leads of the new socket to match those on the old socket. NOTE: There is a white-red lead on the new socket that replaces one of the two brown filament leads on the old socket.

( ) 3. Install the new CRT socket.

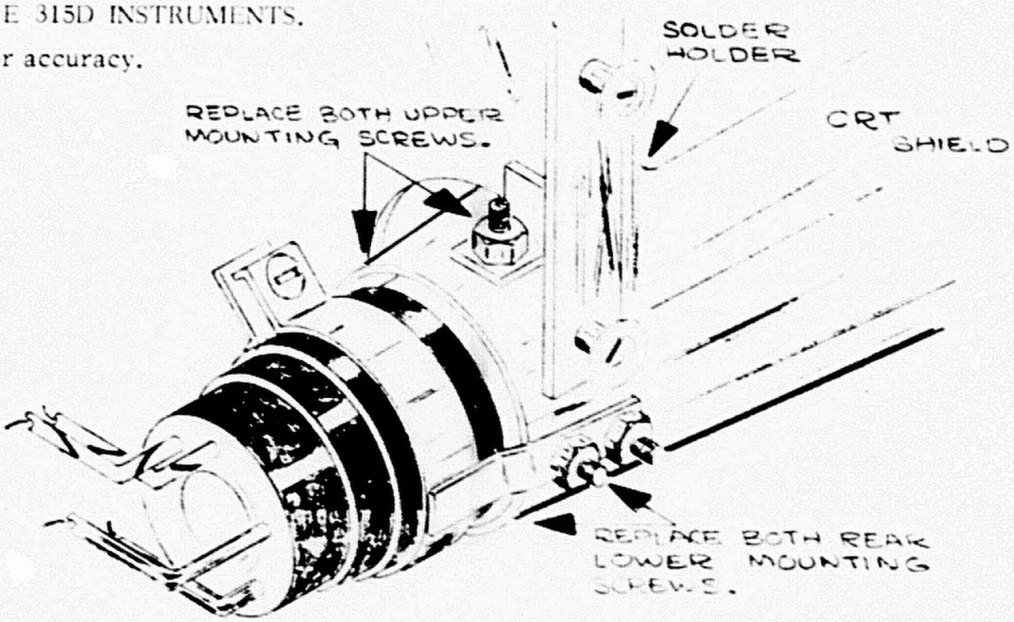
( ) 4. Replace both the HV shields previously removed.

( ) 5. Install the CRT.

THIS COMPLETES THE INSTALLATION FOR THE TYPE 360 INSTRUMENTS.

( ) Check wiring for accuracy.

GG:ls



modification instructions

MI - 050-0141-01

Type 310, 315D, 360

CRT CONVERSION

For the following Tektronix Oscilloscopes:

Type 310 Serial Numbers 101-7139
315D Serial Numbers 101-2978
360 Serial Numbers 101-2576

The Type T3100__ CRT replaces the Type 3WP__ CRT. Replacement of the CRT socket by a 136-0081-00 socket is required to install the new CRT. Four of the binding head screws used in the Type 315D CRT shield are replaced with flat head screws to allow clearance for the new T3100__ CRTs.

This kit does not include the CRT.

NOTE: If the serial number of your instrument is above those listed, or if this kit has been installed, disregard the instructions as the T3100__ CRT is a direct replacement.

CRT Types	Part No.
T3100-01	154-0362-00
T3100-02	154-0363-00
T3100-07	154-0364-00
T3100-11	154-0365-00
T3100-31	154-0366-00

PARTS LIST

Quantity	Part Number	Description
1 ea	136-0081-00	Socket, tube, CRT
4 ea	211-0559-00	Screw, 6-32 x 3/8 FHS, 100° Phillips

INSTRUCTIONS

A. FOR TYPE 315D INSTRUMENTS:

( ) 1. Remove the cathode ray tube (CRT).

( ) 2. Remove the HV shield (337-0016-00) from the top rear, left side of the instrument.

( ) 3. Remove the DC Shift Comp bracket over the rear of the CRT shield.

( ) NOTE: Position the bracket up and toward the opposite side of the instrument.

( ) 4. Unsolder the CRT socket leads, noting their locations in respect to color-code.

( ) 5. Replace the four CRT shield mounting screws, indicated in the drawing, with the four flat head screws from the kit.

( ) 6. Cut the leads of the new socket to match those on the old socket.

NOTE: The new socket has a white-red lead in place of one of the two brown filament leads on the old socket.

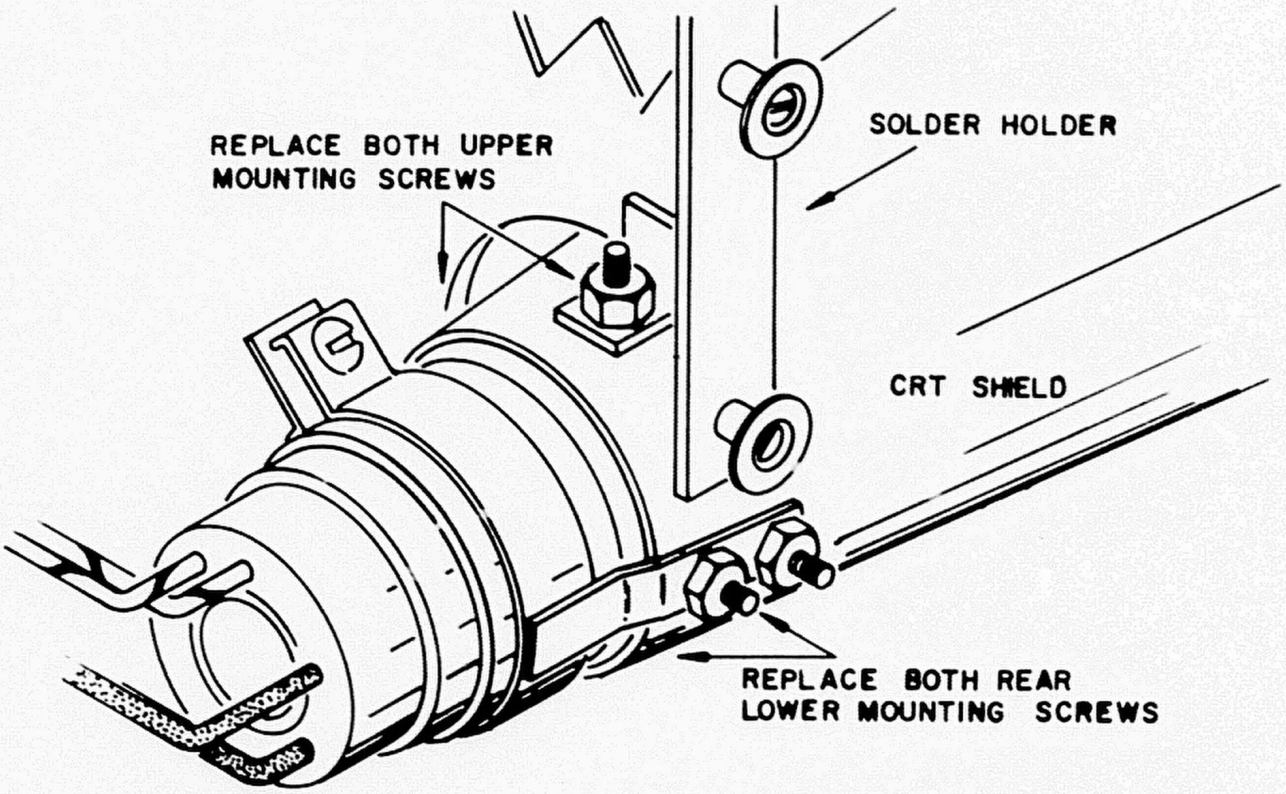
( ) 7. Install the new CRT socket in the instrument.

( ) 8. Replace the DC Shift Comp bracket and HV shield previously removed.

( ) 9. Install the CRT.

THIS COMPLETES THE INSTALLATION FOR TYPE 315D INSTRUMENTS.

( ) Check wiring for accuracy.



INSTRUCTIONS (cont)

B. FOR TYPE 360 INSTRUMENTS:

( ) 1. Remove the cathode ray tube.

( ) 2. Remove the two HV shields.

( ) 3. Remove the CRT socket leads, noting their locations in respect to color-code.

( ) 4. Cut the leads of the new socket to match those on the old socket.

NOTE: There is a white-red lead on the new socket that replaces one of the two brown filament leads on the old socket.

( ) 5. Install the new CRT socket.

( ) 6. Replace both the HV shields previously removed.

( ) 7. Install the CRT.

THIS COMPLETES THE INSTALLATION FOR TYPE 360 INSTRUMENTS.

( ) Check wiring for accuracy.

C. FOR TYPE 310 INSTRUMENTS:

( ) 1. Remove the cathode ray tube.

( ) 2. Remove the CRT socket leads, noting their locations in respect to colot-code.

( ) 3. Cut the leads of the new socket to match those on the old socket.

NOTE: There is a white-red lead on the new socket that replaces one of the two brown filament leads on the old socket.

( ) 4. Install the new CRT socket.

( ) 5. Install the new CRT.

THIS COMPLETES THE INSTALLATION FOR TYPE 310 INSTRUMENTS.

( ) Check wiring for accuracy.

DA:ls

PARTS REPLACEMENT KIT

STABILITY CONTROL

050-149

For Tektronix Type 315D Oscilloscopes
Serial numbers 101-2191

DESCRIPTION

STABILITY potentiometer, part number 311-456 replaces 311-024 in the above listed instruments. The new potentiometer is superior mechanically, allowing for easier replacement.

NOTE: If this kit has been installed, disregard the instructions as P/N 311-456 is a direct replacement.

NOTE: If the serial number of your instrument is above those listed, disregard the instructions and use P/N 311-026 as a direct replacement.

Publication:
Instructions for 050-149
March 1966

Supersedes:
February 1964

PARTS LIST

Quantity	Description	Part Number
1 ea.	Lockwasher, int. 3/8 x 1/2	210-012
1 ea.	Lockwasher, int. 3/8 x 11/16	210-013
2 ea.	Nut, hex, 3/8-32 x 1/2	210-413
1 ea.	Potentiometer, comp, 100k 2w var 20%	311-456
1 ea.	Coupling, pot	376-014
1 ea.	Rod (shaft), extension, steel	384-114
12 in.	Wire, solder, silver-bearing	

INSTRUCTIONS

IMPORTANT: When soldering to the ceramic strips, use the silver-bearing solder supplied with this kit.

( ) 1. Remove red and black knobs from Trigger switch. Loosen nut on switch shaft and position switch up away from chassis as far as leads will permit.

NOTE: On some instruments it may be necessary to temporarily relocate some components mounted on the ceramic strips directly behind SW201. Unsolder C326 from out board ceramic strip and push it down on the chassis between the socket of V205 and the switch. Unsolder R236 from out board ceramic strip and move it out of the way. See drawing.

( ) 2. Remove old potentiometer and hardware.

( ) 3. Install new potentiometer, hardware and coupling (all from kit) as shown in drawing, tighten nut and replace knobs. Replace inner shaft with shaft from kit, if necessary.

NOTE: Due to different spacing on the switch wafers it may be necessary to mount the pot using a nut on each side of the Switch plate. If so use the thin lockwasher (210-012) from kit.

( ) 4. Solder C326 and R236 in ceramic strip.

( ) 5. Tighten switch mounting nut and replace knobs.

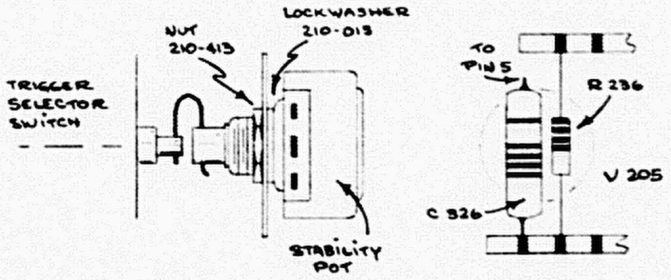
THIS COMPLETES THE INSTALLATION

( ) Check the potentiometer for smooth operation.

( ) Correct your Manual Parts List to read

R231, 100k, 2w, var, comp, 20%, 311-456

JT:cc



MODIFICATION KIT

3-WIRE POWER CORD

050-213

For Tektronix Type 315D Oscilloscope
Serial numbers 101-up

DESCRIPTION

The two-wire power cord 161-002 is replaced by the three-wire power cord 161-017.

The replacement cord is made of improved material and has a ground wire to reduce hazard of shock.

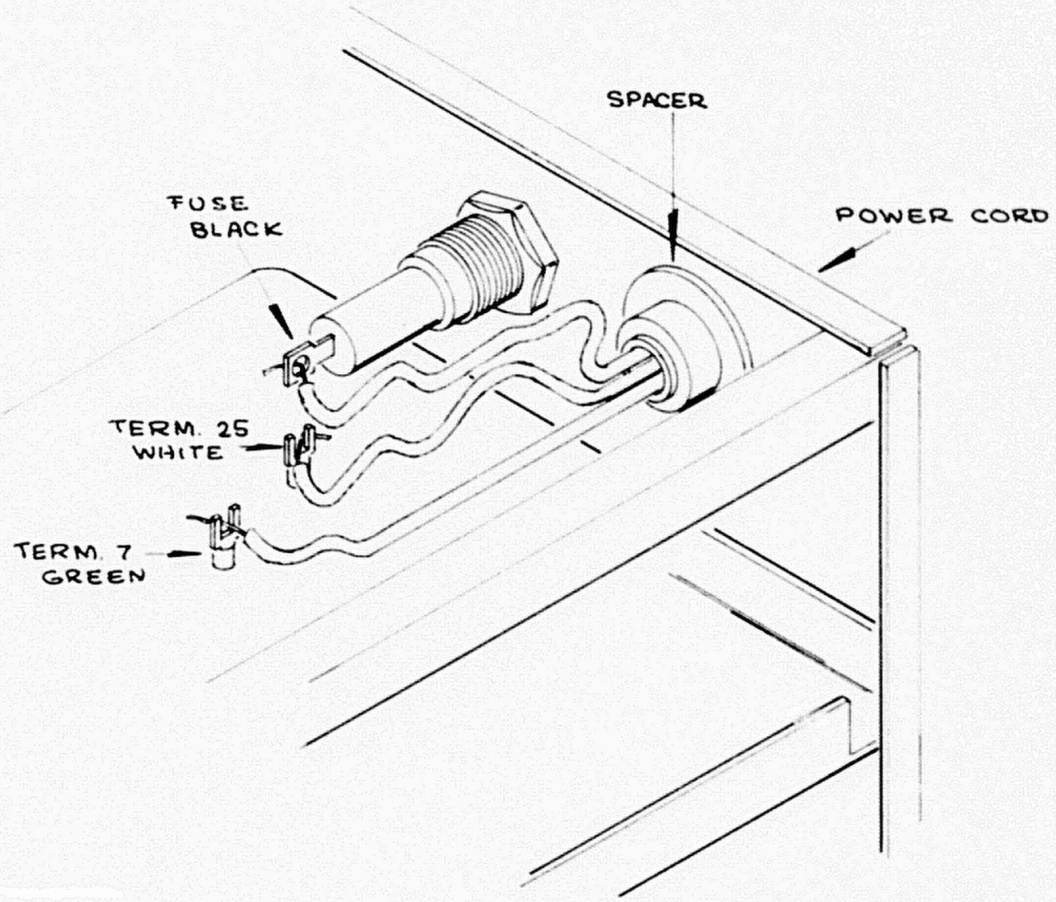
An adapter is also supplied with the new power cord.

NOTE: If the s/n of your instrument is above those listed or if this kit has already been installed, disregard the instructions as P/N 161-017 is a direct replacement.

Publication:
Instructions for 050-213
October 1964

PARTS LIST

Quantity	Description	Part Number
1 ea.	Adapter, power cord, 3-wire to 2-wire	103-013
1 ea.	Cord, 3-wire, 8 ft.	161-017
1 ea.	Spacer, connector, alum, 5/8 ID x 1-1/8 OD x 0.051	210-837
1 ea.	Bushing, Heyco, strain relief	358-025



A. REMOVAL OF POWER CORD FROM INSTRUMENTS BETWEEN S/N 101-1080

( ) 1. Remove the instrument from its cabinet.

( ) 2. Unsolder the white wire from terminal #25 on the power transformer.

( ) 3. Unsolder the black wire from the fuse holder.

( ) 4. Remove the cord from the cable clamp and instrument.

( ) 5. Remove the black bakelite board and mounting hardware.

B. REMOVAL OF POWER CORD FROM INSTRUMENTS S/N 1081-UP

( ) 1. Remove the instrument from its cabinet.

( ) 2. Unsolder the white wire from terminal #25 on the power transformer.

( ) 3. Unsolder the black wire from the fuse holder.

( ) 4. Cut the power cord off at the bushing and pull the remaining cord through it.

( ) 5. Remove the bushing and its spacer. (The bushing and spacer from the kit will be used to install the new cord.)

C. INSTALLATION OF NEW 3-WIRE POWER CORD

( ) 1. Place the 'Heyco' bushing near the end of the cord.

( ) 2. Place the smaller end through the mounting hole in the chassis.

( ) 3. Place the spacer (from kit) over the bushing, on the inside of the chassis, while the bushing is clamped into place. (A pair of pliers will aid in squeezing the bushing together when inserting it in the mounting hole.)

( ) 4. Solder the black wire to the end terminal of the fuse holder.

( ) 5. Solder the white wire to terminal #25 on the power transformer.

( ) 6. Solder the green ground wire to terminal #7 on the power transformer.

THIS COMPLETES THE INSTALLATION

( ) Check wiring for accuracy.

( ) Re-install the instrument in the cabinet.

( ) Correct your Instruction Manual as required.

GG/JT:ls

PARTS REPLACEMENT KIT

SILICON DIODES REPLACE 106-005

050-226

For the following Tektronix Instruments:

Type 315D All serial numbers
Type 180A s/n 5001-6385

DESCRIPTION

152-066 Silicon Diodes replace 106-005 selenium stack which is no longer being manufactured. The silicon diodes offer better reliability and longer life.

If you wish to replace all the selenium stacks at one time, order Modification Kit 040-214, for Type 180A, or 040-220, for Type 315D.

NOTE: If the serial number of your instrument is above those listed or if this kit has already been installed, disregard the instructions and use P/N 152-066 as a direct replacement.

Publication:
Instructions for 050-226
January 1965

PARTS LIST

Quantity	Description	Part Number
1 ea.	Assembly, Silicon rectifier, consisting of:	
4 ea.	Diode, silicon 1N3194	152-066
1 ea.	Resistor, 10Ω 1/2w 10%	302-100
1 ea.	Bracket, mounting	Special
1 ea.	Washer, steel, flat 6L x 3/8 x 0.032	210-803
1 ea.	Screw, 6-32 x 3/8 BHS	211-510
1 ea.	Spool, w/3ft. of silver-bearing solder	214-210

INSTRUCTIONS

( ) 1. Remove selenium stack SR741 (180A), SR701 (180A) or SR460 (315D).

FOR TYPE 180A ONLY

( ) 2. Connect wires to silicon rectifier assembly (from kit) as shown in Fig. 1.

( ) Orient assembly as shown in Fig. 2. If replacing SR701, do not connect the bare wire to SR721 until step 3.

( ) 3. Mount silicon rectifier assembly in instrument using a #6-32 x 3/8 screw and flat washer from the kit. Orient as indicated in Fig. 2 or 3.

( ) Connect bare wire to SR701 as shown in Fig. 2.

FOR TYPE 315D ONLY

( ) 4. Connect wires to the rectifier assembly as shown in Fig. 4.

THIS COMPLETES THE INSTALLATION

( ) Make the necessary corrections to the Parts List in your Instruction Manual.

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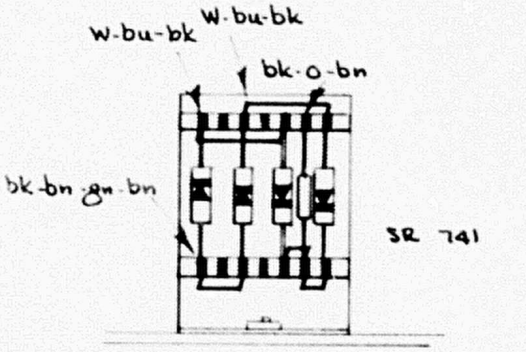
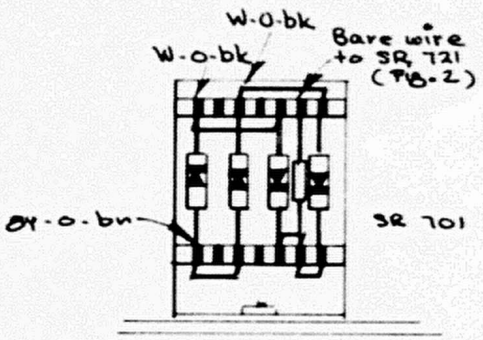
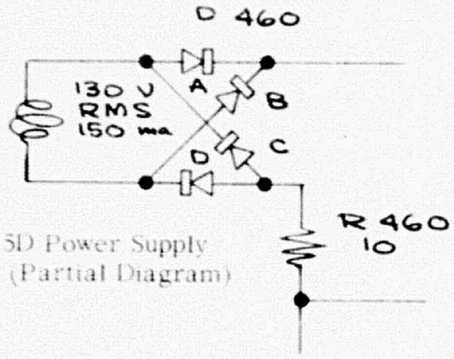


TYPE 180 A
-150 V SUPPLY

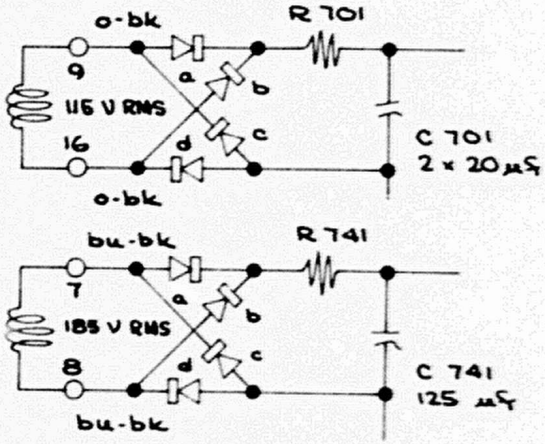


TYPE 180A
+ 350 SUPPLY

Fig. 1



315D Power Supply
(Partial Diagram)



180A Power Supply
(Partial Diagram)

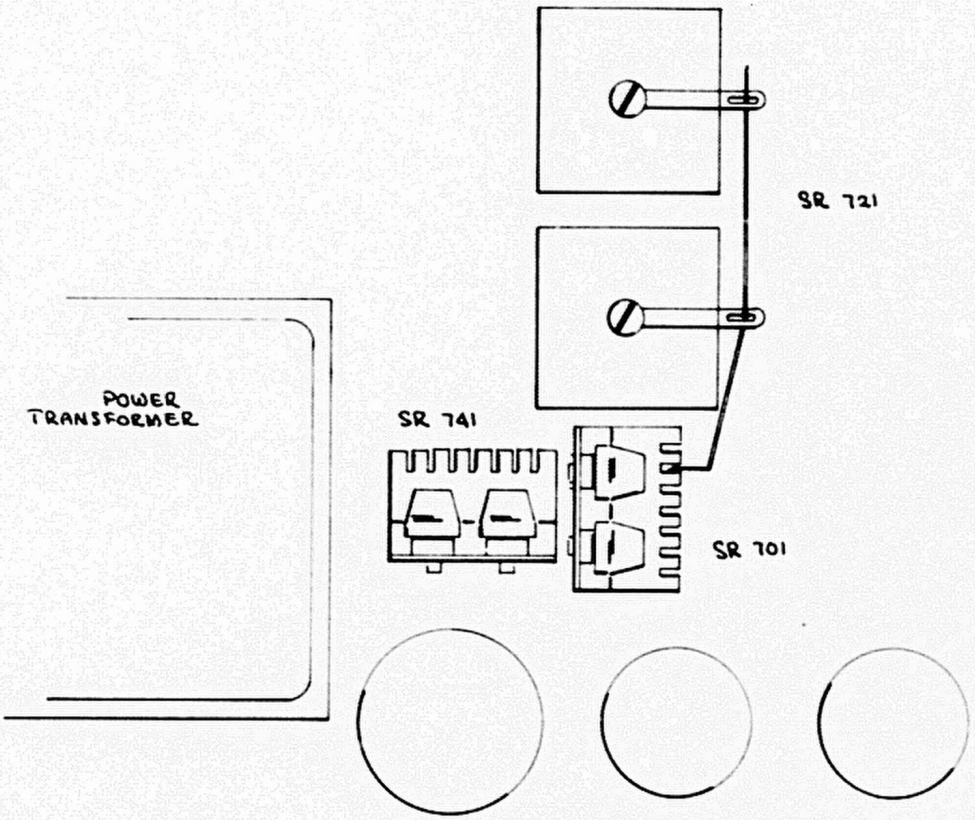


Fig. 2

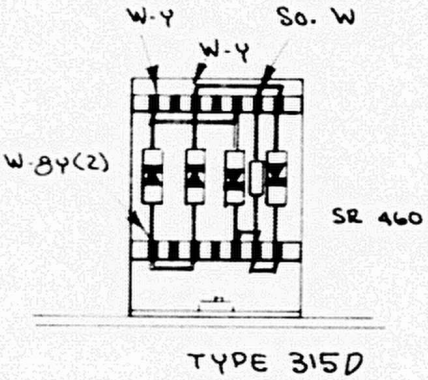


Fig. 3

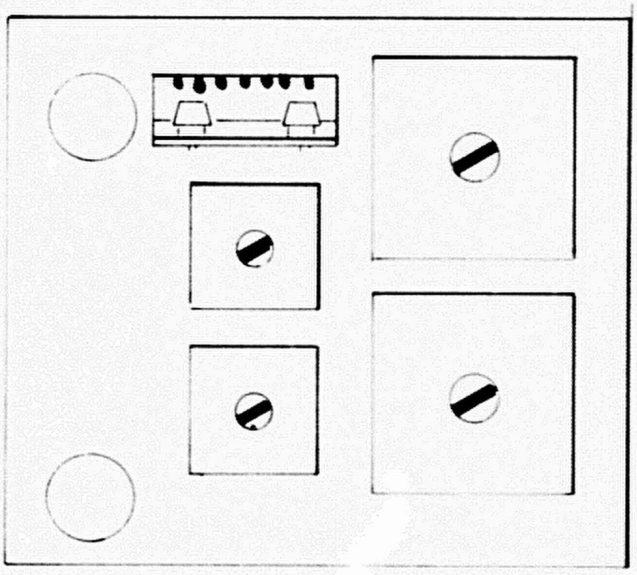


Fig. 4

PARTS REPLACEMENT KIT

SILICON RECTIFIERS FOR DC FAN

For the following Tektronix Oscilloscopes:

Type 315D s/n 101-up
Type 515 s/n 101-up

DESCRIPTION

The selenium rectifier 106-0006-00, which is no longer available, is replaced by silicon diodes. An assembly is provided which includes four silicon diodes (152-0066-00) and mounting bracket.

NOTE: If this kit has already been installed, disregard the instructions and use P/N 152-0066-00 as a direct replacement.

050-0228-00

Publication:
Instructions for 050-0228-00
February 1965

PARTS LIST

Quantity	Description	Part Number
1 ea.	Assembly, silicon rectifier, consisting of:	
2 ea.	Strip, cer, 3/4 x 4 notches (large) clip-mounted	124-0088-00
4 ea.	Diode, silicon 1N3194 400 PIV	152-0066-00
1 ea.	Lockwasher, steel, int #6	210-0006-00
1 ea.	Washer, steel #6L x 3/8 x 0.032	210-0803-00
1 ea.	Screw, 6-32 x 5/16 BHS	211-0507-00
4 ea.	Spacer, nylon-molded, 0.063	361-0007-00
1 ea.	Rod, hex, 1/4 x 7/16	385-0080-00
1 ea.	Bracket, silicon rectifier mounting	406-0531-00
1 ea.	Lockwasher, steel, int #6	210-0006-00
1 ea.	Washer, steel #6L x 3/8 x 0.032	210-0803-00
1 ea.	Screw, 6-32 x 5/16 BHS	211-0507-00
1 ea.	Spool, w/3ft. silver-bearing solder	214-0210-00
2 ea.	Wire, solid, #22 3in. white	(175-0522-00)
2 ea.	Wire, solid, #22 3in. white-red	(175-0522-00)

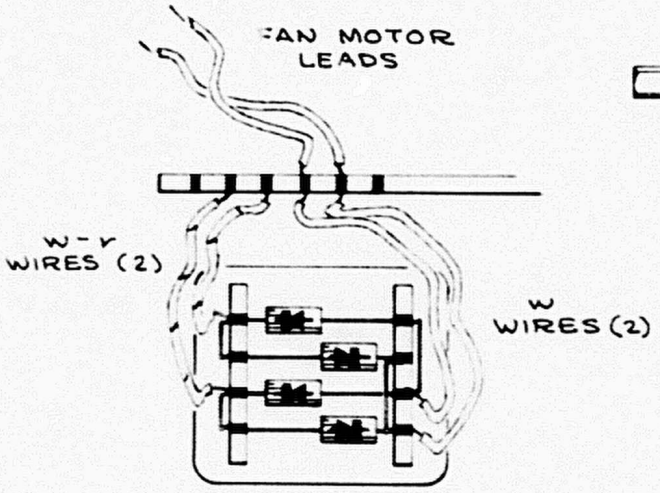


Fig. 1

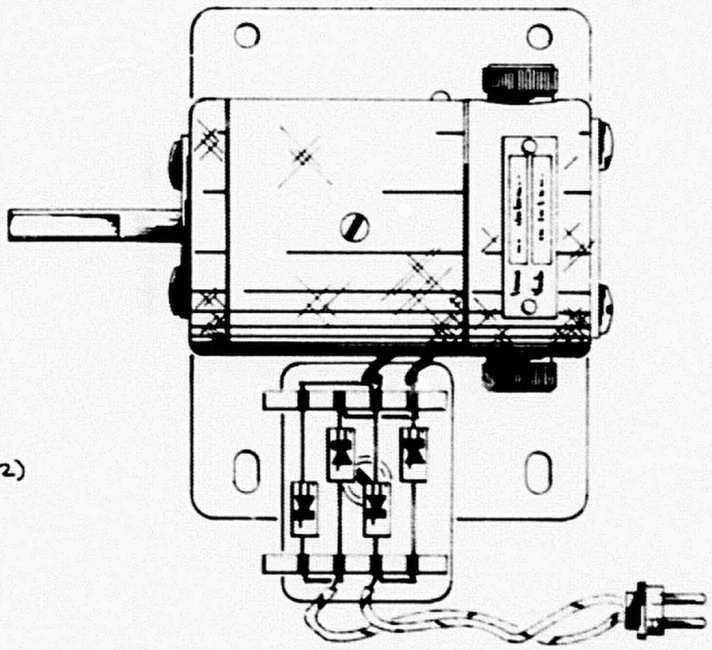


Fig. 2

INSTRUCTIONS

IMPORTANT: When soldering to the ceramic strips, use the silver-bearing solder supplied with this kit.

A. TO REPLACE SELENIUM RECTIFIER IN TYPE 515:

( ) 1. Replace the selenium rectifier on the power chassis with the assembly from the kit. Position the assembly as shown in Fig. 1. Use a lockwasher (from kit) between the assembly and the chassis.

( ) 2. Solder the two white and two white-red wires (from kit) between the assembly and the adjacent ceramic strip as shown in Fig. 1.

B. TO REPLACE SELENIUM RECTIFIER IN TYPE 315D:

( ) 1. Unsolder and remove the selenium rectifier and its mounting bracket.

B. (con'd)

( ) 2. Install the silicon assembly (from kit) using the rear mounting hole of the two used for the selenium mounting bracket. Position the assembly as shown in Fig. 2.

( ) 3. Solder the wires removed from the selenium rectifier to the new assembly as shown in Fig. 2.

THIS COMPLETES THE INSTALLATION

( ) Check wiring for accuracy.

( ) Correct your Instruction Manual Parts List and Power Supply schematic as necessary.

GG/TL:ceb