FIELD MODIFICATION KIT

IMPROVED -100V SUPPLY AND CALIBRATOR REFERENCE

For the following Tektronix instruments:
Types 561 all serial numbers
RM561 all serial numbers

INTRODUCTION:

Installation of this modification adds a transistor amplifier in the feedback loop of the -100V supply, thereby improving power supply regulation and ripple. The improved regulation reduces drift in the 3S76 Sampling Plug-in.

This modification kit also supplies a precision resistor to replace one of the resistors in the calibrator circuit, therefore providing an accurate voltage reference when using 50 Ω systems, such as the Type 3S76 Sampling Plug-in.

KIT LIST:

Quantity	Description				Tek Number
1 ea.	Transistor,	J3138			151-087
1 ea.	Tube, vacuum,	6DJ8			154-187
1 ea.	Resistor, comp.	3 K	1/2 w.	5%	301-302
1 ea.	Resistor, comp.	10 meg	1/2 w.	10%	302-106
1 ea.	Resistor, comp.	180 K	1/2 w.	10%	302-184
1 ea.	Resistor, comp.	2.2 K	1/2 w.	10%	302-222
2 ea.	Resistor, comp.	47 K	1/2 w.	10%	302-473
1 ea.	Resistor, WW	10 K	1/2 w.	1% (Daven)	308-226
1 ea.	Resistor, prec.	100 Ω	1/2 w.	1%	309-112
1 ea.	Resistor, prec.	250 Ω	1/2 w.	1%	309-178
1 ea.	Tag, ECC88/6DJ8	(cut special)			334-767
1 ea.	Tubing, plastic, #20 black,		1-3/4 in.	(162-504)	
2 ea.	Wire, #22 solid, pre-bent,		3-notch jumper	(176-125)	
3 ea.	Wire, #22 solid, pre-bent,		4-notch jumper	(176-126)	
1 ea.	Wire, #22 solid,		6 in.	black-red-black-black	
1 ea.	Wire, #22 stranded,		9 in.	black-brown-black-brown	
1 ea.	Wire, #22 solid,		24 in.	bare	
1 ea.	Wire, solder, silver-bearing,		24 in.		

INSTRUCTIONS:

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

NOTE: Steps 1 through 31 apply to Standard 561 instruments. For Rack-mounted instruments, begin with Step 32.

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INSTRUCTIONS: (continued)

STEPS 1 THROUGH 31 APPLY TO STANDARD 561's

( ) 1. Locate the ceramic strips, CSA, CSB, CSC & CSD, which are supporting the components associated with the -100 V supply (see Fig. 1). Also, note the slot numbering arrangement (i.e., CSA-1 indicates ceramic strip "A" and the first notch).

NOTE: Fig. 1 shows the completed modification.

CONNECTIONS ON TOP OF STRIPS ONLY

CONNECTIONS BELOW TOP OF STRIPS

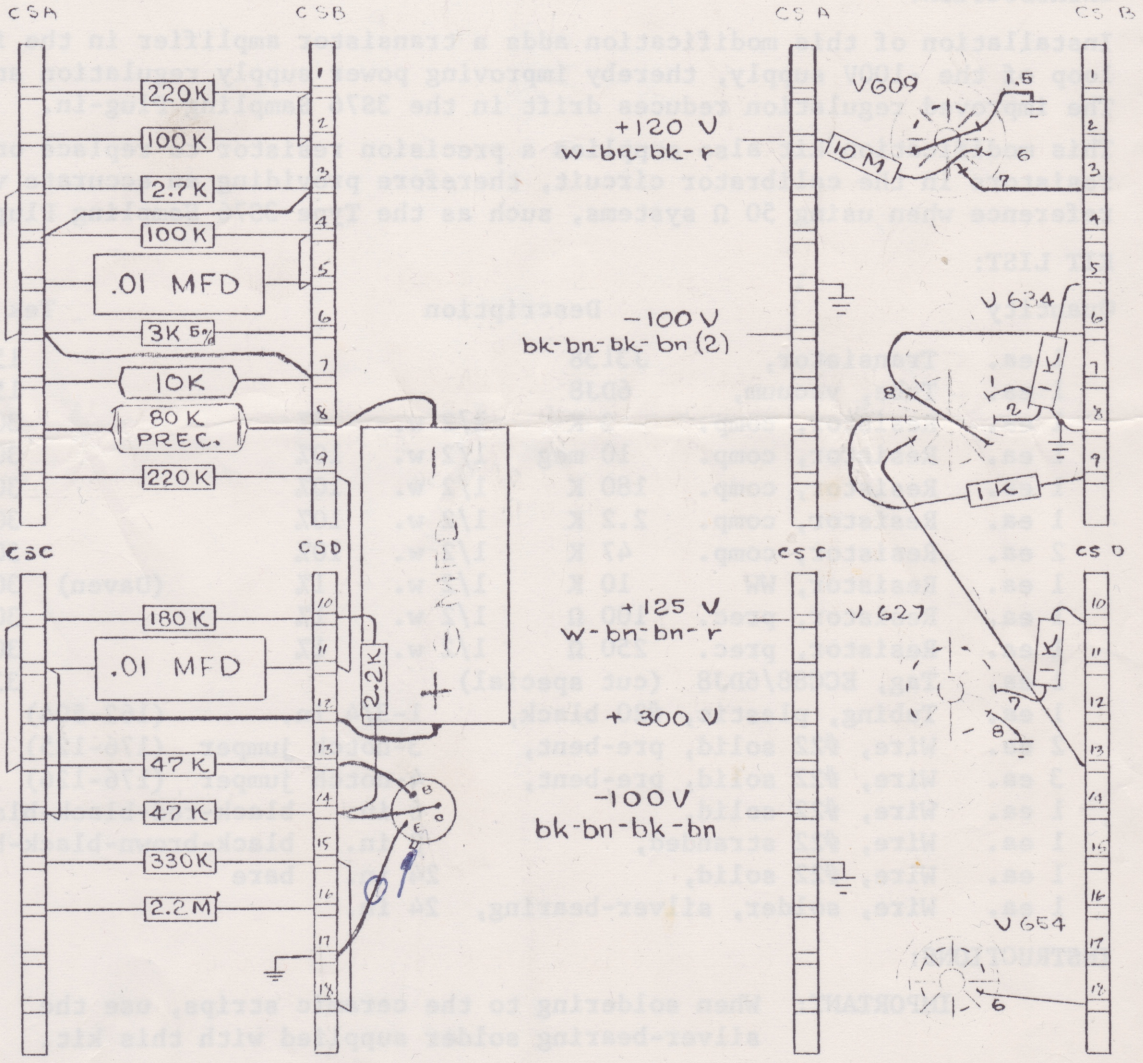

FIG. 1

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INSTRUCTIONS: (continued)

( ) 2. Carefully unsolder the following components and wires:

DO NOT DISCARD ANY PARTS UNTIL THE MODIFICATION IS COMPLETED.

FOR INSTRUMENTS BELOW s/n 1280

( ) 100 K resistor between CSA-2 and CSB-2
( ) 2.7 K resistor between CSA-3 and CSB-3
( ) strap from CSA-3 to ground
( ) end of strap from CSB-3 to pins 1 and 5 of V609, at CSB-3 only
( ) .01 µf capacitor between CSA-5 and CSB-5
( ) end of strap from CSA-5 to pin 7 of V609, at CSA-5 only

FOR INSTRUMENTS ABOVE s/n 1279

( ) 100 K resistor between CSA-2 and CSB-2
( ) 10 meg resistor between CSA-3 and CSB-3
( ) .01 µf capacitor between CSA-5 and CSB-5
( ) end of strap from CSA-4 to pins 1 and 5 of V609, at CSA-4 only
( ) end of strap from CSA-5 to pin 7 of V609, at CSA-5 only
( ) 2.7 K resistor from CSA-4 to ground

FOR ALL INSTRUMENTS

( ) 27 K resistor between CSA-6 and CSB-6
( ) black-brown-black-brown (-100 V) wires from CSA-5 and CSA-6
( ) strap between CSA-5 and CSA-6
( ) 80 K Daven resistor between CSA-7 and CSB-7
( ) 7 K Daven resistor between CSA-8 and CSB-8
( ) 220 K resistor between CSA-9 and CSB-9
( ) strap between pins 7 and 8 of V634. Leave pin 8 connected to CSB-6.
( ) strap between CSC-10 and CSD-10
( ) 8 µf capacitor between CSD-10 and CSD-17
( ) .01 µf capacitor between CSC-11 and CSD-11
( ) 1 K resistor from pin 2 of V634 to CSD-11
( ) 1 K resistor from pin 9 of V634 to CSB-5
( ) 330 K resistor between CSC-12 and CSD-12
( ) 3-notch jumper strap between CSC-10 and CSC-12
( ) NE-2 neon bulb and holder from CSD-12, CSD-14 and CSC-13
( ) 680 K resistor between CSC-14 and CSD-14
( ) tubing covered strap from CSD-12 to pin 6 of V634
( ) strap between pins 1 and 3 of V634
( ) white-brown-brown-red (+125V) wires from pin 1 of V634
( ) strap from CSC-11 to ground

( ) 3. Remove the silk-screening "ECF80/6BL8" from both sides of the chassis, with lacquer thinner or other similar solvent. Use caution not to remove the "V634" silk-screening.

( ) Install the "6DJ8" tag from the kit.

NOTE: Refer to Fig. 1 while performing Steps 4 through 19.

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INSTRUCTIONS: (continued)

( ) 4. Solder a 4-notch jumper strap (from kit) on outside of strip CSC (on side away from V627), between CSC-10 and CSC-13.

( ) 5. Solder the two (2) white-brown-brown-red (+125V) wires (removed from pin 1 of V634 in Step 2) to CSC-10.

( ) 6. Solder the free end of the bare wire, attached to pins 1 and 5 of V609, to the nearest tube socket ground lug.

( ) 7. Solder the end of the strap attached to pin 7 of V609 to CSB-3.

( ) 8. Solder a 4-notch jumper strap (from kit) between CSA-3 and CSA-6.

( ) 9. Solder the 10 meg, 1/2 w. resistor (from kit) from pin 6 of V609 to CSA-2.

( ) 10. Solder a length of bare wire (from kit) between CSA-4 and CSB-3. (This strap is already on instruments BELOW s/n 1280).

( ) 11. Solder a length of bare wire (from kit) from pin 1 of V634 to the nearest tube socket ground lug.

( ) Solder a length of bare wire (from kit) from CSA-5 to the nearest tube socket ground lug.

( ) 12. Solder a 1 K, 1/2 w. resistor (removed in Step 2) from pin 2 of V634 to CSB-5.

( ) 13. Solder a length of bare wire (from kit) between pins 3 and 8 of V634 and CSB-6.

( ) 14. Remove the end of the 1 K, 1/2 w. resistor from CSD-14 and solder it to CSD-10 (the other end goes to pin 7 of V627).

( ) 15. Solder a length of bare wire (from kit) to pin 6 of V634.

( ) Slip a 1-3/4 in. length of tubing over the strap, cut to length and solder the other end to CSD-13.

( ) 16. Solder a 1 K, 1/2 w. resistor (removed in Step 2) from pin 7 of V634 to CSB-9.

( ) 17. Solder a 4-notch jumper strap (from kit) between CSC-11 and CSC-14 on the inside of the strip (side nearest V627).

( ) 18. Solder the two (2) #26 black-brown-black-brown (-100V) wires (removed in Step 2) to CSA-6. (Do not solder the #22, -100V wire at this time).

19. Solder in the following components and wire:

( ) 100 K, 1/2 w. resistor (removed in Step 2) between CSA-2 and CSB-2

( ) 2.7 K, 1/2 w. resistor (removed in Step 2) " CSA-3 " CSB-3

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INSTRUCTIONS: (19. continued)

( )	.01 µf capacitor	(removed in Step 2)	between	CSA-5 and CSB-5
( )	3 K, 1/2 w. 5% resistor	(from kit)	"	CSA-6 " CSB-6
( )	10 K, WW 1% resistor	(from kit)	"	CSA-7 " CSB-7
( )	80 K, WW 1% resistor	(removed in Step 2)	"	CSA-8 " CSB-8
( )	220 K, 1/2 w. resistor	(removed in Step 2)	"	CSA-9 " CSB-9
( )	180 K, 1/2 w. resistor	(from kit)	"	CSC-10 " CSD-10
( )	2.2 K, 1/2 w. resistor	(from kit)	"	CSD-10 " CSD-14
( )	.01 µf capacitor	(removed in Step 2)	"	CSC-11 " CSD-11
( )	a length of bare wire	(from kit)	"	CSC-12 " CSD-12
( )	47 K, 1/2 w. resistor	(from kit)	"	CSC-13 " CSD-13
( )	47 K, 1/2 w. resistor	(from kit)	"	CSC-14 " CSD-14
( )	8 µf electrolytic cap.	(removed in Step 2)	with '+' end to	CSD-12
			and '-' end to	CSB-8

( ) transistor (from kit) with the base lead going to CSD-13, the collector to CSD-14 and the emitter to CSD-17 (ground)

IMPORTANT: To avoid damaging the transistor, use pliers on the leads to dissipate the heat.

( ) 20. Remove V634 (6BL8) from its socket and replace it with the 6DJ8 from the kit.

( ) 21. Disconnect the two (2) black-brown-black-brown wires from the time-base plug-in connector, terminal 23.

( ) 22. With an ohmmeter, determine which of these wires is unsoldered, near CSA-6 (see Step 18).

( ) 23. Clip this wire at both ends, as close to the cable as possible.

( ) 24. Solder one end of the 9 in. black-brown-black-brown wire (from kit) to the negative terminal (mounting lug) on C640 (opposite V627).

( ) 25. Dress this wire under the cables, as close to the chassis as possible, and solder it, along with the remaining black-brown-black-brown wire (left disconnected in Step 21) to terminal 23 of the plug-in connector.

FOR INSTRUMENTS BELOW s/n 430, WITH EXCEPTIONS

NOTE: If your instrument does not have the strap shown in dotted lines between the 150 Ω and 220 Ω resistors, as indicated in Fig. 2, disregard Steps 26 through 28.

( ) 26. Remove the 220 Ω, 2 w. resistor (R744) from notch 10 of the ceramic strips (see Fig. 2, on page 6).

( ) 27. Remove the end of the strap (shown in dotted lines) from notch 10 of the upper strip, trim it and resolder to notch 10 of the lower strip (see Fig. 2).

( ) 28. Replace the 220 Ω, 2 w. resistor removed in Step 26.

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INSTRUCTIONS: (28. continued)

( ) Remove the 100 Ω, 1/2 w. 10% resistor (R898) mounted betweeen the Calibrator switch and the Cal Out connector, and replace it with the 100 Ω, 1/2 w. 1% precision resistor from the kit.

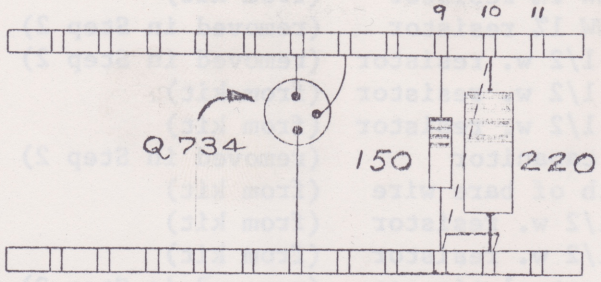

FIG. 2

( ) 29. THIS COMPLETES THE INSTALLATION for the Type 561. Check wiring for errors.

( ) 30. Insert the modified -100 V supply and Manual parts list pages in your instruction manual.

( ) 31. It will be necessary to re-adjust the power supplies. Refer to the CALIBRATION Procedure in your instruction manual.

STEPS 32 THROUGH 52 APPLY ONLY TO RACK-MOUNTED INSTRUMENTS

( ) 32. Locate the ceramic strips supporting the components associated with the -100 V supply in Fig. 3, and note the numbering arrangement.

NOTE: Fig. 3, on page 7, shows the completed modification.

( ) 33. Carefully remove the following:

DO NOT DISCARD ANY COMPONENTS UNTIL THE MODIFICATION IS COMPLETED.

( )	all parts and straps connected	between	CSA and CSB, notches 1-11			
( )	bare wire	"	CSC-1 and CSD-1			
( )	1 K resistor	from	CSA-1	to	pin 9 of V634	
( )	jumper wire	"	CSA-1	"	CSA-3	
( )	jumper wire	"	CSA-2	"	CSA-5	
		(leave ground strap connected to CSA-2)				
( )	straps	from	CSA-4	to	pin 7 or 8 of	V634
( )	1 K resistor	"	CSA-6	"	pin 2 "	V634
( )	strap	"	CSA-7	"	pin 7 or 8 "	V634
( )	strap	"	CSA-8	"	pin 6 "	V634
( )	jumper wire	"	CSA-9	"	CSA-11	
	(leave 1 K resistor in place	"	CSA-9	"	pin 7 "	V627)
( )	strap	"	CSA-10	"	pin 3 "	V627
	(leave 10 meg " " "	"	CSA-10	"	pin 6 "	V609)

NOTE: Instruments BELOW s/n 260 do not have this 10 meg resistor. It will be installed on the instrument later.

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INSTRUCTIONS: (33. continued)

( ) jumper wire from CSB-1 to CSB-2
(leave white-green wire connected to CSB-1)

( ) jumper wire from CSB-3 to CSB-4
(leave strap to -100 V connected to CSB-4)

( ) strap from CSB-8 to +300 V on adjacent ceramic strip
( ) strap " CSC-1 " CSD-1
( ) strap " CSC-1 " pin 4 or 7 of V609
( ) strap between pins 1 and 3 " V634
( ) strap " " 7 " 8 " V634

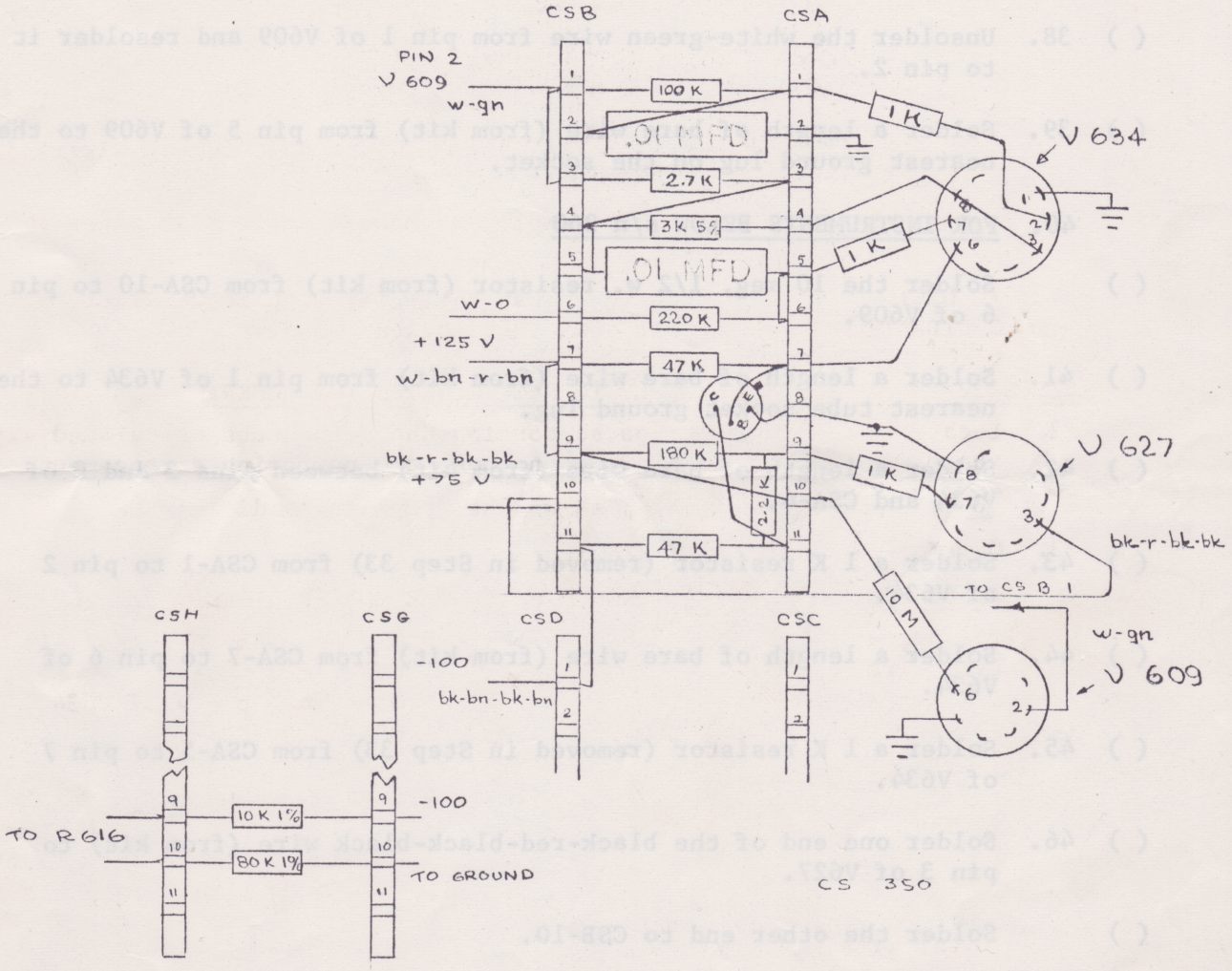

FIG. 3

( ) 34. Remove the silk-screening "6BL8" from both sides of the chassis with lacquer thinner or other similar solvent. Use caution not to remove the "V634" silk-screening.

( ) Install the "6DJ8" tag from the kit.

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INSTRUCTIONS: (continued)

NOTE: Refer to Fig. 3 while performing Steps 35 through 49.

( ) 35. Locate the 7 K and 80 K Daven resistors on strips CSG and CSH.

( ) Remove the 7 K Daven resistor between CSG-10 and CSH-10.

( ) 36. Unsolder the 80 K Daven resistor between CSG-9 and CSH-9, and resolder it between CSG-10 and CSH-10.

( ) 37. Solder the 10 K Daven resistor (from kit) between CSG-9 and CSH-9.

( ) 38. Unsolder the white-green wire from pin 1 of V609 and resolder it to pin 2.

( ) 39. Solder a length of bare wire (from kit) from pin 5 of V609 to the nearest ground lug on the socket.

40. FOR INSTRUMENTS BELOW s/n 260

( ) Solder the 10 meg, 1/2 w. resistor (from kit) from CSA-10 to pin 6 of V609.

( ) 41. Solder a length of bare wire (from kit) from pin 1 of V634 to the nearest tube socket ground lug.

( ) 42. Solder a length of bare wire (from kit) between pins 3 and 8 of V634 and CSA-4.

( ) 43. Solder a 1 K resistor (removed in Step 33) from CSA-1 to pin 2 of V634.

( ) 44. Solder a length of bare wire (from kit) from CSA-7 to pin 6 of V634.

( ) 45. Solder a 1 K resistor (removed in Step 33) from CSA-5 to pin 7 of V634.

( ) 46. Solder one end of the black-red-black-black wire (from kit) to pin 3 of V627.

( ) Solder the other end to CSB-10.

( ) 47. Solder a length of bare wire (from kit) from CSA-8 to the nearest tube socket ground lug.

( ) 48. Solder the following components and wire straps between the points specified:

( )	length of bare wire	(from kit)	from	CSA-5	to CSA-6
( )	3-notch jumper	(pre-bent, " ")	"	CSB-1	" CSB-3

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INSTRUCTIONS: (48. continued)

( )	length of bare wire	(from kit)	from	CSB-4	to CSB-5
( )	3-notch jumper	(pre-bent, " ")	"	CSB-7	" CSB-9
( )	length of bare wire	(" ")	"	CSA-1	" CSB-2
( )	length of bare wire	(" ")	"	CSA-3	" CSB-4
( )	length of bare wire	(" ")	"	CSA-10	" CSB-9
( )	2.2 K resistor	(" ")	"	CSA-9	" CSA-11
( )	100 K resistor	(removed in Step 33)	"	CSA-1	" CSB-1
( )	.01 µf capacitor	(" " " 33)	"	CSA-2	" CSB-2
( )	2.7 K resistor	(" " " 33)	"	CSA-3	" CSB-3
( )	3 K resistor, 5%	(from kit)	"	CSA-4	" CSB-3
( )	.01 µf capacitor	(removed in Step 33)	"	CSA-5	" CSB-5
( )	220 K resistor	(" " " 33)	"	CSA-6	" CSB-6
( )	47 K resistor	(from kit)	"	CSA-7	" CSB-7
( )	180 K resistor	(" ")	"	CSA-9	" CSB-9
( )	47 K resistor	(" ")	"	CSA-11	" CSB-11

( ) 49. Solder in the transistor with the base at CSA-7, the emitter at CSA-8 (ground) and the collector at CSA-11.

IMPORTANT: To avoid damaging the transistor, use pliers on the leads to dissipate the heat.

( ) 50. Remove V634 (6BL8) from its socket and replace it with the 6DJ8 from the kit.

( ) Remove the 100 Ω, 1/2 w. 10% resistor (R898) mounted between the Calibration switch and the Cal Out connector, and replace it with the 250 Ω, 1/2 w. 1% precision resistor from the kit.

( ) 51. THIS COMPLETES THE INSTALLATION for RM561's

( ) Insert the modified -100 V supply schematic and Manual parts list pages in your instruction manual.

( ) 52. It will be necessary to re-adjust the power supplies. Refer to the CALIBRATION Procedure in your instruction manual.

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IMPROVED -100V SUPPLY AND CALIBRATOR REFERENCE

TEK 040-288

Types 561/RM561 -- all serial numbers

GENERAL INFORMATION:

Installation of this modification adds a transistor amplifier in the feedback loop of the -100V supply, thereby improving power supply regulation and ripple. The improved regulation reduces drift in the 3S76 Sampling Plug-in.

This modification kit also supplies a precision resistor to replace one of the resistors in the calibrator circuit, therefore providing an accurate voltage reference when using 50 Ω systems, such as the Type 3S76 Sampling Plug-in.

PARTS LIST: *

RESISTORS

R609	10 meg	1/2 w.	Fixed	comp.	10%		302-106
R618	10 K	1/2 w.	Fixed	WW	1%	(Daven)	308-226
R624	47 K	1/2 w.	Fixed	comp.	10%		302-473
R625	2.2 K	1/2 w.	Fixed	comp.	10%		302-222
R626	180 K	1/2 w.	Fixed	comp.	10%		302-184
R633	47 K	1/2 w.	Fixed	comp.	10%		302-473
R635	3 K	1/2 w.	Fixed	comp.	5%		301-302
R898 (Standard only)	250 Ω	1/2 w.	Fixed	prec.	1%		309-178
R898 (RMs only)	100 Ω	1/2 w.	Fixed	prec.	1%		309-112

TRANSISTORS

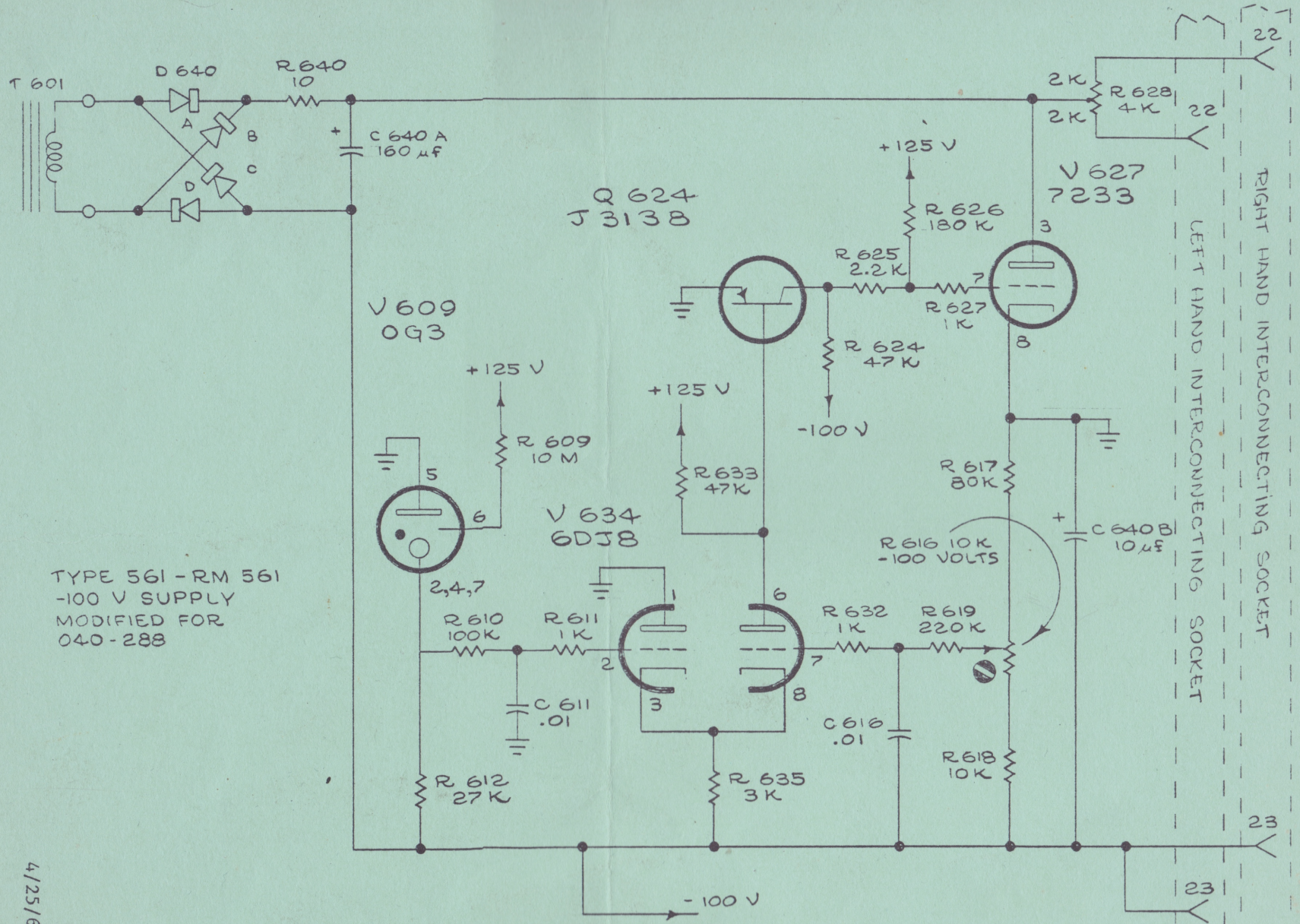
Q624	J3138	151-087

TUBES

V634	6DJ8	154-187

* only new parts listed

4/25/62



TYPE 561 - RM 561
-100 V SUPPLY
MODIFIED FOR
040 - 288

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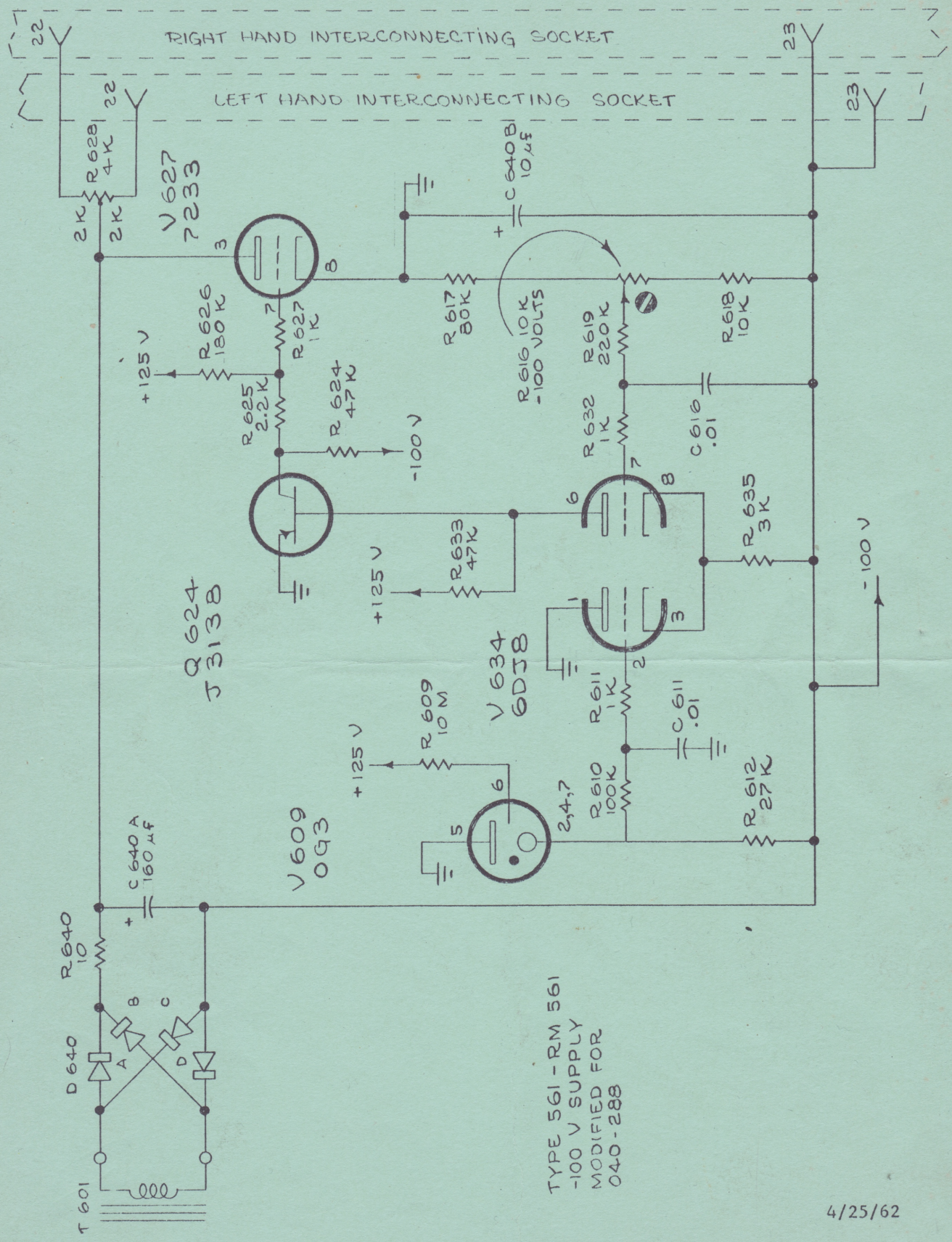

TYPE 561 - RM 561
-100 V SUPPLY
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