



Tunnel Diode Pulse Generator Calibration (includes specifications)

Equipment Required:

- 1 Sampling plug-in (1S1, 4S1, or 3S76) and scope.
- 1 Type 575 curve tracer.
- 1 Triplett VOM or equivalent.
- 1 General Radio coaxial connector tool kit 874TOK, p/n 003-0038-00.
- Inspect pulser for wiring errors, unsoldered joints, shorted coaxial cable connections and loose hardware. Separate wrap-around from pulser and unplug both cables.
- Measure resistance to ground from secondary side of power switch (SW129). Resistance should be about 10 to 20K using Triplett 630 Meter. (common is negative)
- Install batteries, plug (+) end to ground and insert transistors;
 151-0083-00 in Q100 socket and 2N1304 in Q123.
- 4. Connect VOM to battery terminal and ground. Meter should indicate about 22.5 volts. Turn power switch to ON, meter reading with fresh batteries should show 0.5 to 1V drop.
- 5. Connect PRETRIGGER cable from wrap-around housing to pretrigger connector on chassis. Connect a GR cable from PRETRIGGER GR connector on housing to input of sampling plug-in. Pretrigger signal, as viewed on sampling scope, should have a rise time of 1.0 nSEC or less for 0 to 200MV amplitude. Total pulse amplitude should be 400 MV. 151-0083-00 transistors will have to be selected to meet these specs.

- 6. With the tunnel diode correctly installed and checked (see separate tunnel diode installation procedure) in the airline, plug it into the input of the sampling plug-in.
- 7. Position the pulser assembly so the cable for the tunnel diode drive will plug on to the LR119 isolation network which will then plug on to the coax connector on the side of the airline.
- 8. With power switch ON, advance DRIVE control clockwise and trigger sampler until a negative step is viewed on the sampling scope. Decrease DRIVE until tunnel diode just fires and is stable, and foot of negative step is the flatest. Check for the following specs: risetime, equal to the sampler plug-in; fast-pulse step amplitude, 400 mV; pulse-base amplitude (foot), 200 mV 100 mV; pulse length, 35 nSEC.
- 9. Turn off pulser power and disconnect pulser from sampling scope. Assemble pulser in wrap-around housing being careful not to get internal cables between airline and coiled delay line cable. Connect pretrigger internal cable to chassis-mounted connector and tunnel-diode drive cable to right-angle connector of isolation network which is connected to side of airline. Install bottom cover plate and secure by attaching feet.
- 10. Using two 2-nSEC cables into each channel of the sampling plug-in, display both the PULSE OUTPUT and the PRETRIGGER signals on a dual trace. Trigger on the plus polarity of the PRETRIGGER signal and measure the time difference. If the 1S1 is the sampling plug-in used, a dual trace display is not possible; but by using two 2X GR attenuators on the two pulse outputs and connecting through the two 2-nSEC cables into a GR "Tee", the "Tee" output can be displayed on a single trace. In either case, trigger positive on the plus (+)

step of the PRETRIGGER pulse and identify the PRETRIGGER pulse from the negative step of the PULSE OUTPUT. With the sampling timing at 10 nSEC/cm and the pulser DRIVE fully clockwise, check that the time difference is 55 nSEC or greater. (55 nSEC) the PRETRIGGER pulse should be on the left (early) side of the display.

Specifications:

Pulse Output

Risetime: 30 pSEC (Not checked) Amplitude: - 0.4 V Duration: 35 nSEC

Pretrigger

Amplitude: + 0.4 V into 50 Ω approx. 60 nSEC early

Recommendations:

To be used for risetime checks on Tektronix sampling systems.

Tunnel Diode Installation Procedure.

A. To remove diode:

- Remove airline completely from wrap-around by unscrewing knurled retaining nut.
- Remove locking nut and unscrew small coaxial connector where the LR isolation network plugs on. Remove connector and spring contact. Tweezers may be necessary to get spring contact out.
- Unscrew and remove knurled clamp nut at end of airline. Diode removed at this time.
- Using the GR tools, loosen the coupling nut at the output end of the airline. Unscrew by hand.
- Remove the outer transition GR conductor along with the insulator bead, inner conductor and airline center conductor.
 Do not lose delrin center-conductor spacer.
- B. To install diode:
 - 1. First prepare new diode according to diagram.
 - 2. Be sure center conductor and GR inner conductor are tight to GR insulator bead. Replace bead if crazed and tighten with GR inner conductor wrench. Insert bead into outer transition piece. Slip on center conductor spacer on taper. Install in housing. (See A-4 above)
 - 3. Install center conductor assembly into housing, lining up slot on airline housing with GR transition piece. Tighten coupling nut on outer transition piece. Use GR tools.
 - 4. Insert tunnel diode in threaded hole, disc side out, so knurled clamp nut will make the electrical connection to the disc on the diode.

- 5. Install knurled clamp nut; finger tight only.
- 6. Check electrical diode connections with the Type 575. Set 575 up for 100 mA TD check and connect airline center conductor to negative and airline housing to positive.
- 7. Install spring contact into small coaxial connector with the long end out. Insert long end of spring contact into small hole on side of airline and screw small connector into place on airline finger tight. Check electrical connection as in step 7 only connect negative to center conductor of small coaxial connector. Tighten connector more if connection is not made.
- Install lock nut on small coaxial connector and reinstall airline in wrap-around housing.



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NEW ITEM	or 1-3	PART NUMBER	TOTAL QUANT	QTY PER	DESCRIPTION	CIRCUIT #
		006-0506-00	2		Battery, 22.5V Meda 215	
ŝ		E108-0364-00	1		Coil, 0.1mh LR-109	
		120-0247-00	1		Toroid, TD 43	
		120-0264-00	1		Toroid, TD 61	
		124-0158-00	4		Strip, ceramic, 7 notch	
		E129-0086-00	4		Post, hex spacer	Dwg. #1313-A
		E129-0087-00	2		Post, delay line cord	Dwg. #1314-A
		131-0155-00	2		Connector, Amph. 27-1,500 cable	
		131-0156-00	1		Connector, Amph, 27-3, 50Ω chass	sis
_0		E131-0156-02	1		Connector, 131-0156-00 reworked	Dwg. #1322-A
·		E131-0370-00	1		Connector, Amph. 27-2, 50Ω	
		131-0394-00	1		Connector, Amph. 50Ω snap on	
		132-0001-00	2		Nut, coupling, GR 874-62	
	-	132-0002-00	2		Conductor, outer, GR 874-60-3	
		132-0007-00	2		Ring, snap, GR 874-81	
		132-0016-00	2		Nut, retaining, GR 874-620	
		132-0026-00	1		Outer, transition, GR 874-653	
in _{3.}		132-0027-00	1		Inner transition, GR 874-654	
		132-0028-00	2		Insulator, GR 874-70	· · · · · · · · · · · · · · · · · · ·
94 		132-0029-00	2		Inner conductor, GR 874-61-4	
		132-0040-00	2		Adapter, panel, Zamak #5	
		136-0181-00	2		Socket, transistor, 3-pin	
0		151-0069-00	1		Transistor, 2N1304	
		151-0083-00	1		Transistor, 2N964, selected	
		152-0008-00	1		Diode, T-12-G	
		152-0115-00	2		Diode, snap off	

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NEW ITEM	or. 1-3	PART	TOTAL	QTY PER	DESCRIPTION	CIRCUIT #
		F152-0254-01	1		Tunnel diode (w/disc) ass'y	Dwg. #1469 (Cir. #D-119)
£		166 0221 00	1		Tube formula $0.089 \times 1/4$	
		166-0221-00	1		lube, leitule, 0.009 x 1/4	Pro #1/17_P
		E200-02/7-01	1		Cover, top	Dwg. #141/-B
Disputs and our distriction of the		E200-0277-02	1		Cover, bottom	Dwg. #1419-B
		E205-0061-00	1		Shell ass'y (RF XMSN Line)	
					1)E204-0058-00 Dwg. #1323-A	
					1)E205-0059-00 Dwg. #1319-A	Shell ass'y Dwg. #1412-B
Common 2 201 data Alexand					1)E205-0060-00 Dwg. #1321-A	
		210-0004-00	4		Lockwasher, Int. #4	
0		210-0046-00	1		Lockwasher, Int.	
		210-0215-00	3		Lug, solder, pee wee	
		210-0223-00	1		Lug, solder, 1/4"	
Glanap Schrönen Strategergege		210-0562-00	2		Nut, hex 1/4-32 x 1/16	
an ad man was a constant		210-0940-00	2		Washer, flat, 1/4"	
		211-0007-00	8		Screw, 4-40 x 3/16 BHS or PHS PH	il.
		211-0014-00	4		Screw, 4-40 x 1/2 BHS or PHS Ph	11.
		211-0071-00	1		Screw, 4-40 x 3/8 PHS Phil.	
h,a		211-0507-00	2		Screw, 6-32 x 5/16 BHS or PHS P	nil.
The Contract Connected and		213-0055-00	3		Screw, 2-32 x 3/16 PHS Phil. Th	rd form
8.		213-0123-00	4		Screw, 6-32 x 3/8 FHS P hil.	
		E213-01 45-00	1		Screw, thumb	Dwg. #1317-A
		E214-0685-00	1		Conductor, inner, RF XMSN line	Dwg. #1318-A
0		E214-0686-00	1	-	Contact, elec., spring action	Dwg. #1326-A
		260-0643-00	1		Switch, toggle	
		E276-0110-00	1		Bushing, insulator	Dwg. #1320-A
		281-0524-00	1		Capacitor, 150 pf 500V	

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NEW ITEM	or 1-3	PART NUMBER	TOTAL	QTY PER	DESCRIPTION	CIRCUIT #
Historya yoon, goor dawa goo goo goo		283-0003-00	2		Capacitor, 0.01uf 150V discap	
and the second second		283-0026-00	1		Capacitor, 0.2uf 25V discap	
		283-0065-00	2		Capacitor, 0.001 ±5% 100V discap	
		283-0590-00	2		Capacitor, button, 7.5pf ±5% 500	v
		E311-0160-00	1		Pot, 50K ±10% 3/8 x 3/8	
		315-0102-00	4		Resistor, 1K 1/4W 5%	
		315-0223-00	1		Resistor, 22K 1/4W 5%	
		315-0510-00	4		Resistor, 51Ω 1/4W 5%	
		316-0124-00	1		Resistor, 120K 1/4W 10%	
\bigcirc		316-0684-00	1		Resistor, 680K 1/4W 10%	
		E333-0928-00	1		Panel, top (front) Film #3023	Dwg. #1316-A
		334-0679-00	1		Tag, serial number insert	
		E344-0128-00	2		Clip, battery, spring tension	Dwg. #1315-A
		348-0005-00	1		Grommet, rubber, 1/2"	
		348-0037-00	4		Foot, rubber, 1/2"	
		354-0234-00	2		Ring, transistor socket	
		E358-0295-00	1		Bushing, insulator, inner cond.	Dwg. #1325-A
		E358-0297-00	1		Bushing, form, delay line	Dwg. #1416-B
		361-0007-00	8		Spacer, ceramic strip	
		366-0153-00	1		Knob, charcoal	
		E380-0098-00	1		Housing, wraparound	Dwg. #1289-C
		E386-1046-00	1		Plate, top, delay line	Dwg. #1413-B
0		E386-1047-00	1		Plate, bottom, delay line	Dwg. #1414-B
		E441-0673-00	1		Chassis, (S/S #2254)	Dwg. #1415-B
					Shell assembly instructions	Dwg. #1418-B
					Schematic	Dwg. #1534-B

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NEW ITEM	or 1-3	PART NUMBER	TOTAL QUANT	QTY PER	DESCRIPTION	CIRCUIT #
		162-0020-00	1		Tubing, ins. #6 black 3/8"	
		162-0531-00	3		Thermofit, #12 black 1"	
		175-0068-00	1		Cable, coax, RG174 8-66 20 ft.	
		175-0068-00	1		Cable, coax, RG174 8-34 20 ft.	
		175-0068-00	1		Cable, coax, RG174 8-55 9 1/2"	
		175-0527-00	1		Wire, #22 strand. 9-6 5"	
		175-0527-00	1		Wire, #22 strand. 9-6 3 3/4"	
0		PACKAGING				
and control in particular states and states						
		004-0212-00	1		End cap	
II C (II C SIN		004-0409-00	1		Box	
		004-0521-00	2		Pad	
		006-0640-00			'Popcorn' - packing material	
		006-0768-00	1		Bag, poly, 8 x 12"	
	5	067-0513-00	1		Tunnel Diode Pulse Generator	
18 ₁₄			1		Cal. procedure, parts lists, spe	25.
0						



TUNNEL DIODE PULSE GENERATOR

CALIBRATION FIXTURE 067-0513-00