

OPTION 15

DESCRIPTION

Option 15 adds two additional outputs to the rear panel of the instrument, CH 2 Signal Out and A GATE Out.

This document contains the Description, Specification, Performance Check, Adjustment Procedure, and Replaceable Parts information for Option 15. The schematic illustration of each circuit is also included with this document.

CH2 Signal Output

The CH 2 SIGNAL OUT Connector located on the rear-panel provides an output signal that is a normalized

representation of the Channel 2 input signal. The output amplitude into a 1 M Ω load is approximately 20 mV per division of input signal. Into a 50- Ω load, the output amplitude is approximately 10 mV per division of input signal.

A GATE Output

The A GATE OUT Connector located on the rear-panel provides a TTL and CMOS Compatible, positive-going gate signal that is HI during the A Sweep and LO when the A Sweep is not running.

SPECIFICATIONS

Electrical Characteristics

CHARACTERISTICS	PERFORMANCE REQUIREMENTS
CH 2 SIGNAL OUT	
Temperature Range	-10 to 55° C.
Dynamic Range	±7 divisions.
Deflection Factor	
Into 50 Ω	10mV/div ±10%.
Into 1 M Ω	20mV/div ±10%.
3dB Bandwidth	DC to 25 MHz.
DC Offset (Adjusted)	< 0.5 div (measured at 2 mV/div).
A GATE OUTPUT	
Output Voltage	3.5 V to 5.25 V positive-going pulse starting at 0 V to 0.7 V.
Output Drive	Will supply 4 mA during HI state, will sink 20 mA during LO state. ^a

^a Performance Requirement not checked in manual.

PERFORMANCE VERIFICATION CHECK

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Equipment Required

Leveled Sine-Wave Generator
 Calibration Generator
 Test Oscilloscope

50- Ω BNC Precision Coaxial Cable
 50- Ω BNC Coaxial Cable
 50- Ω BNC Termination

1. CH 2 Signal Output

a. Set:

VERTICAL MODE	CH 1 and CH 2 (CH 3 and CH 4 Off)
BW LIMIT	Off
VOLTS/DIV	2 mV
Input Coupling	
CH 1 and CH 2	GND
A and B SEC/DIV	1ms
TRIGGER MODE	AUTO LVL
SOURCE	VERT
COUPLING	NOISE REJ

b. Push the CH 2 VERTICAL MODE button so that light is off.

c. Connect the CH 2 signal from the rear-panel CH 2 SIGNAL OUT connector to the CH 1 OR X input connector via a 50- Ω BNC cable.

d. Align the CH 1 trace to the center graticule line.

e. Set CH 1 Input Coupling to DC.

f. CHECK—Displayed trace is within 0.5 division of the ground reference set above (neglect trace width).

g. Connect a 1 kHz, 10 mV standard-amplitude signal from the Calibration Generator to the CH 2 Input Connector via a 50- Ω BNC cable.

h. Set CH 2 Input Coupling to DC.

i. Set CH 1 VOLTS/DIV to 20 mV.

j. CHECK—Display amplitude is 4.5 to 5.5 divisions (neglect trace width).

k. Connect a 50- Ω terminator to the CH 1 Input.

l. Set CH 1 VOLTS/DIV to 10 mV.

m. CHECK—Display amplitude is 4.5 to 5.5 divisions (neglect trace width).

n. Set CH 2 VOLTS/DIV to .1 V.

o. Connect a 50 kHz signal from the Leveled Sine-Wave Generator to the CH 2 input connector via a precision 50- Ω BNC cable and a 50- Ω Termination.

p. Adjust the generator output level to produce a 6-division CH 1 display.

q. Increase the generator frequency to 25 MHz.

r. CHECK—Display amplitude is 4.24 divisions or greater.

s. Disconnect the test setup.

2. A GATE Output

a. Set:

SEC/DIV	0.1 ms
TRIGGER MODE	Auto
HOLDOFF	Minimum (CCW)

b. Connect a test oscilloscope to the A GATE OUT Connector from the rear-panel via a 50- Ω BNC cable.

c. CHECK—Test oscilloscope displays a signal with a high level between 2 V and 5.25 V and a low level between 0 V and 0.7 V.

d. CHECK—Duration of the high level is greater than or equal to 0.2 ms.

e. Set HOLDOFF Control to maximum (CW).

f. CHECK—Duration of the high level is greater than or equal to 2 ms.

g. Disconnect the test setup.

ADJUSTMENT PROCEDURE

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1. CH 2 Signal Output

NOTE

The CH 1 and CH 2 STEP BALANCE Adjustment Procedures (located in the Service Manuals Adjustment Procedure Section) must be completed before continuing with this procedure.

- a. Set CH 2 Input Coupling to GND.
- b. Connect the CH 2 signal from the rear-panel CH 2 SIGNAL OUT Connector to the CH 1 OR X input Connector via a 50- Ω BNC cable.

c. Set CH 1 VOLTS/DIV to 2 mV.

- d. Set CH 1 Input Coupling to GND and align the trace with the center graticule line.
- e. Set CH 1 Input Coupling to DC.
- f. Adjust R1508 until the displayed trace is aligned with the reference set above (neglect trace width).

2. A GATE Output

There are no adjustments for the A GATE Output.

MAINTENANCE

A10—Main Board Replacement

When replacing the A10—Main Board with a new board, two diodes will need to be removed from the old

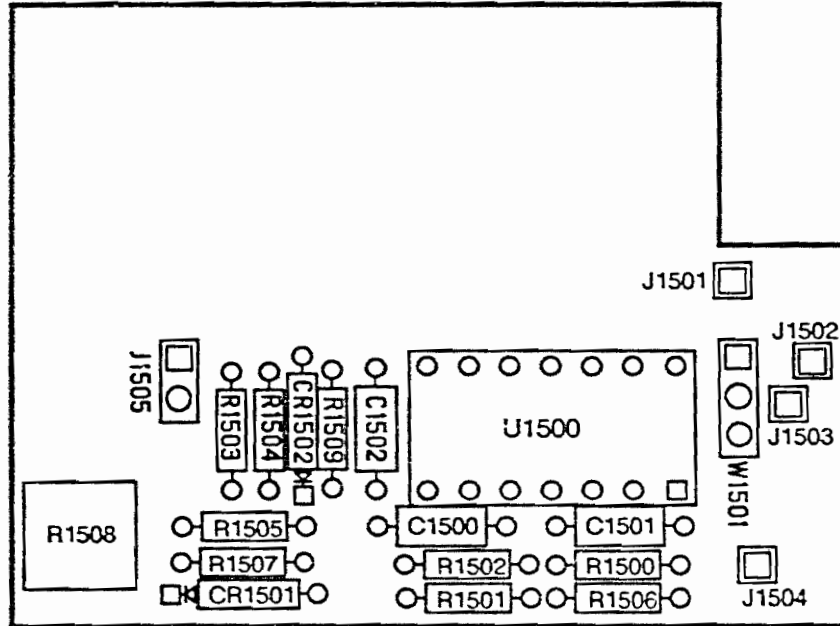
Main Board and added to the new board. These diode are CR601 and CR602. Refer to the A10—Main Board figure in this manual for location of these two diodes.

REPLACEABLE ELECTRICAL PARTS LIST

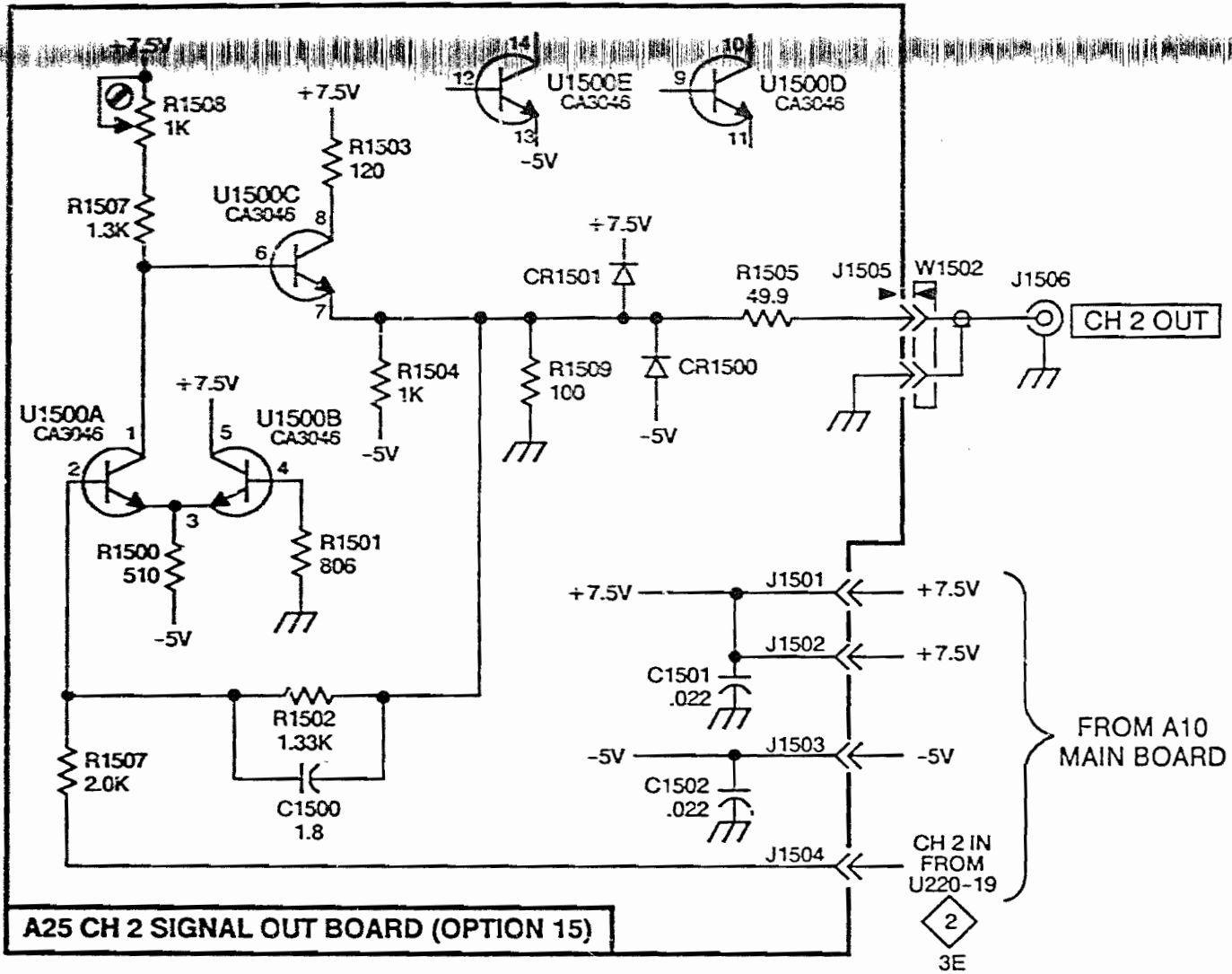
Component No.	Tektronix Part No.	Name & Description
A25	671-1153-00	CIRCUIT BD ASSY: CH 2 OUT OPT
A25C1500	281-0915-00	CAP,FXD,CER DI: 1.8PF,+/-0.25PF,200V
A25C1501	281-0909-00	CAP,FXD,CER DI: 0.022UF,20%,50V,TUBULAR,MI
A25C1502	281-0909-00	CAP,FXD,CER DI: 0.022UF,20%,50V,TUBULAR,MI
A25CR1500	152-0141-02	SEMICON DVC,DI: SW,SI,30V,150MA,30V,DO-35
A25CR1501	152-0141-02	SEMICON DVC,DI: SW,SI,30V,150MA,30V,DO-35
A25E1502	276-0635-00	CORE,EM: TOROID,FERRITE 0.5 OD X 0.281 ID X 0.2
A25J1501	131-0590-00	TERMINAL, PIN: 0.71 L X .025 SQ PH BRZ,GLD PL
A25J1503	131-0590-00	TERMINAL, PIN: 0.71 L X .025 SQ PH BRZ,GLD PL
A25J1504	131-0590-00	TERMINAL, PIN: 0.71 L X .025 SQ PH BRZ,GLD PL
A25J1505	136-0252-00	SOCKET,PIN TERM: U/W 0.019 DIA PINS
A25J1506	131-0955-00	CONN,RCPT,ELEC: BNC,FEMALE
A25R1500	313-1511-00	RES,FXD,FILM: 510 OHM,5%,0.2W
A25R1501	322-3184-00	RES,FXD,FILM: 806 OHM,1%,0.2W
A25R1502	322-3205-00	RES,FXD,FILM: 1.33K OHM,1%,0.2W
A25R1503	313-1121-00	RES,FXD,FILM: 120 OHM,5%,0.2W
A25R1504	313-1102-00	RES,FXD,FILM: 1K OHM,5%,0.2W
A25R1505	322-3068-00	RES,FXD,FILM: 49.9 OHM,1%,0.2W
A25R1507	322-3222-00	RES,FXD,FILM: 2K OHM,1%,0.2W
A25R1507	313-1132-00	RES,FXD,FILM: 1.3K OHM,5%,0.2W
A25R1508	311-2258-00	RES,VAR,NONWW: TRMR,1K OHM,20%,0.5
A25R1509	313-1101-00	RES,FXD,FILM: 100 OHM,5%,0.2W
A25U1500	156-0048-00	MICROCKT,LINEAR: 5 XSTR ARRAY,CA3046,14 DIP,MI
A25W1502	174-1649-00	CABLE ASSY,RF: 50 OHM COAX,16.0 L,W/HARMONICA,9-3
A10CR601	152-0141-02	SEMICON DVC,DI: SW,SI,30V,150MA,30V
A10CR602	152-0141-02	SEMICON DVC,DI: SW,SI,30V,150MA,30V
CHASSIS PARTS		
W1503	174-1841-00	LEAD,ELECTRICAL: 22 AWG,6.0 L,9-N,W/STRAIN RELIEF
J1507	131-0955-00	CONN,RCPT,ELEC: BNC,FEMALE

REPLACEABLE MECHANICAL PARTS LIST

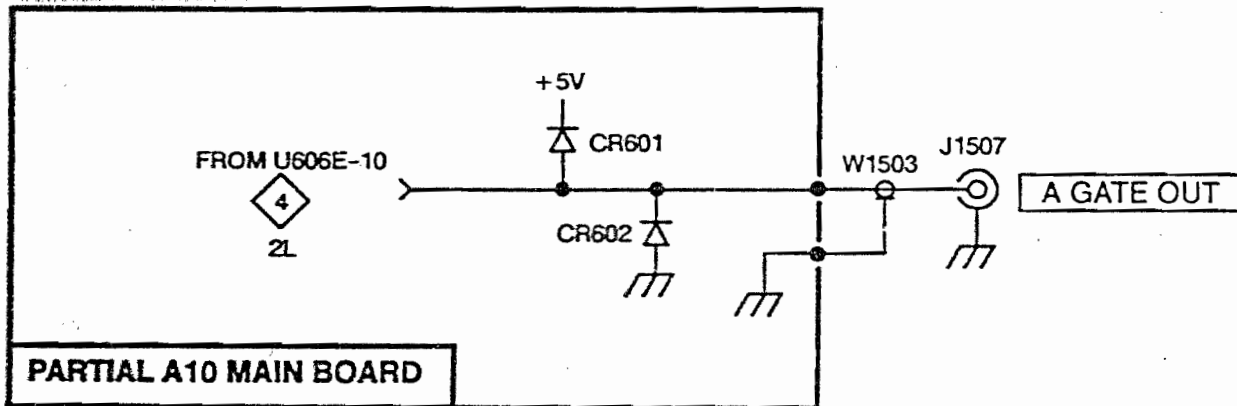
Tektronix Part No.	Qty	Name & Description
361-1535-00	1	SPACER,SLEEVE: 0.45 L X 0.313 OD,AL
211-0690-01	1	SCREW,MACHINE: 6-32 X 0.875,PNH,SST,TORX
210-0255-00	2	TERMINAL,LUG: 0.391 ID,LOCKING,BRS CD PL
334-7486-00	1	MARKER,IDENT: MARKED Z AXIS A GATE OUT CH 2 OUT



A25 CH 2 Signal Out Board.



CH 2 Signal Out Diagram.



A Gate Out Diagram.