

CONNECTORS

DC Input

J1
JST_XH_vert_01x04

Signal Output

J5
Molex_73100-0154

Board mount BNC receptacle

Auxiliary Output Connector

J6
JST_PH_vert_01x03

Frequency Dials

Frequency Knob

J2
JST_PH_vert_01x03
100K POT

Frequency Range Switch

J7
JST_PH_vert_01x06

SP4T PANEL MOUNT ROTARY SWITCH

Output Select Dial

J4
JST_PH_vert_01x06

SP4T PANEL MOUNT ROTARY SWITCH

Duty Cycle Dial

J3
JST_PH_vert_01x03
2K POT
USE LOWEST VALUE POSSIBLE

(2x)I² / R SHOULD NOT EXCEED POWER RATING

Amplitude Dial

J8
JST_PH_vert_01x03
1M POT

DC Offset Dial

J9
JST_PH_vert_01x03
10K POT

SQUARE-TRIANGLE GENERATOR

Integrator with Schmitt feedback

RV1 10K
TRIM GAIN ADJUST
R5 47K
R7 220
R8 220
R10 100K
U2A ADB26
U2B ADB26
FC 1 10uF
FC 2 10uF
FC 3 1uF
FC 4 0.1uF
C3 10uF
C4 1uF
C5 1uF
C6 0.01uF
C27 27pF
5V NOM AMPLT
SIG_TRI_RAW
GND

SQUARE GENERATOR

Comparator with Schmitt and DC control

DC
R6 1K
R11 100K
U1
C1 0.1uF
C2 0.1uF
C3 0.1uF
C4 0.1uF
C5 0.1uF
C6 0.1uF
C7 0.1uF
C8 0.1uF
C9 0.1uF
C10 0.1uF
C11 0.1uF
C12 0.1uF
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C314 0.1uF
C315

The image contains two circuit diagrams and a panel mount diagram.

Inverting amplifiers: This section shows two identical circuit diagrams. The first diagram, labeled "JP1 S1_OPEN", shows an inverting amplifier using U3A (AD826). The input is TRI_RAW, which goes through a 100K resistor R15 to the inverting input (pin 2). The non-inverting input (pin 3) is connected to GND. The output (pin 1) is SIG_TRI, which is scaled to 1V amplitude. A feedback resistor RV3 (100K) is connected between the output and the inverting input. A TRIM potentiometer is connected between the output and the non-inverting input. The second diagram, labeled "JP2 S1_OPEN", shows an identical circuit for the SQR signal, with input SQR_RAW, resistor R16, and output SIG_SQR scaled to 1V amplitude. A feedback resistor RV4 (100K) is used.

OUTPUT SELECT: This diagram shows a 4-position switch (SP4T SWITCH) that selects between four inputs: SIG_SIN, SIG_SQR, SIG_TRI, and GND (DC). The output of the switch is labeled SIG_PREOUT.

PANEL MOUNT: This is a simple rectangular box representing the panel mount for the circuit.

POWER

+12V

C7 10uF

C9 1uF

C11 0.1uF

C15 0.01uF

C8 10uF

C10 1uF

C12 0.1uF

C16 0.01uF

-12V

ELEC

OUTPUT AMP

Output Amplitude Control
Inverting Amp

U4A AD826

Gain adjustable approx 0 to 12

IG. PREOUT

200K

RV5

APL_1

APL_2

Output DC Offset
Unity gain summing amp

U4B AD826

R17 100K

R19 100K

OFFSET

+12V

C13 0.1uF

U2C AD826

-12V

C14 0.1uF

+12V

C17 0.1uF

U3C AD826

-12V

C18 0.1uF

SCHEMATIC REVISION REFLECTS PRODUCTION CIRCUIT


Ray Sun
EE 90
Analog Electronics Project
California Institute of Technology
Sheet: 7
File: triumph_main_producer.kicad_sch
Title: Triumph Analog
Size: B
Date: 11/1/2019
KiCad E.D.A. kicad (5.1.2)

The output stage of the AD8265 consists of three main components:

- Output Amplitude Control Inverting Amp:** This stage uses op-amp U4A (AD826) to provide gain. The input is SIG_PREOUT through a 200K resistor (RV5). The feedback path is adjustable from 0 to 12V. The output is labeled APL_1 and APL_2 .
- Output DC Offset Unity gain summing amp:** This stage uses op-amp U4B (AD826) to sum the output of the inverting amp with a DC offset. The offset is provided by a 100K resistor (R17) connected to the $OFFSET$ pin. The output is labeled APL_1 and APL_2 .
- Output Buffer:** This stage uses op-amp U5A (AD826) to buffer the output of the summing amp. The output is labeled SIG_OUT .

The circuit also includes a **Not used** op-amp U5B (AD826) and a **Not used** op-amp U3C (AD826).

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Sheet: /
File: triumph_main_production.sch

TRIUMPH

Title: Triumph Analog Function Generator – Main Board

Size: B	Date: 2019-06-12	Rev: B
KiCad E.D.A. kicad	(5.1.2)–1	Id: 1/1