Optical paper-tape reader — Rev A

Bill of materials · Dots & Dashes · Interfacing Teletypes and Paper Tape, Vol 7

Revision: A **Date:** 2026-11-03 **Lines:** 10 **Source:** https://dots-and-dashes.fubsypoly.com/interfacing-teletypes-and-paper-tape/vol-7/

A hand-pull optical reader for 5- and 8-level tape: nine IR LED / phototransistor pairs on a 0.1 in pitch, an MCP3008 and a Pico, thresholds learned by a calibrate button. Reference designators match tape_reader_schematic.svg. Not yet built by the author.

Tick **Ord** when ordered, **Have** when it is in hand and checked against the part number, **Fit** when it is installed. Write the vendor, order number and price on the last page. Alternates for obsolete (EOL) parts are in **bold**.

Same The original part is still made — buy it. **EOL** Obsolete: buy new-old-stock or the substitute given. **Spec** The value matters more than usual — see the note.

Conflict The sources disagree — the value listed is the one checked against the board. **Choice** A builder's choice — the listed part is one that works; others will.

ORD	HAVE	FIT	QTY	REF. DES.	PART / SPECIFICATION	PART NUMBER	ALTERNATES / SUBSTITUTES	WHERE TO BUY	TAG	NOTES
Electronics										
☐	☐	☐	**1**	—	**Raspberry Pi Pico** MicroPython firmware main.py	SC0915	Pico 2 SC1631	Digi-Key www.digikey.com/en/products/result?keywords=… Mouser www.mouser.com/c/?q=SC0915	**Same**	
☐	☐	☐	**1**	U1	**8-channel 10-bit ADC** SPI, DIP-16, runs at 3.3 V	Microchip MCP3008-I/P	MCP3208-CI/P (12-bit, same pinout)	Digi-Key www.digikey.com/en/products/result?keywords=… Mouser www.mouser.com/c/?q=MCP3008-I/P	**Same**	
☐	☐	☐	**10**	D1–D9 (+1 spare)	**IR LED 940 nm** 3 mm (T-1), narrow beam	Vishay TSAL4400		Digi-Key www.digikey.com/en/products/result?keywords=… Mouser www.mouser.com/c/?q=TSAL4400	**Same**	
☐	☐	☐	**10**	Q1–Q9 (+1 spare)	**Phototransistor** 3 mm (T-1), daylight filter	Vishay TEFT4300		Digi-Key www.digikey.com/en/products/result?keywords=… Mouser www.mouser.com/c/?q=TEFT4300	**Same**	
☐	☐	☐	**3**	R1–R3	**Resistor 47 Ω** ¼ W — LED strings ≈30 mA	Yageo MFR-25FBF52-47R		Digi-Key www.digikey.com/en/products/result?keywords=… Mouser www.mouser.com/c/?q=MFR-25FBF52-47R	**Same**	
☐	☐	☐	**9**	R (×9)	**Resistor 22 kΩ** ¼ W — phototransistor loads; try 47 kΩ for dense tape	Yageo MFR-25FBF52-22K		Digi-Key www.digikey.com/en/products/result?keywords=… Mouser www.mouser.com/c/?q=MFR-25FBF52-22K	**Same**	

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☐	☐	☐	**1**	C1	**Capacitor 0.1 µF** ceramic, MCP3008 decoupling	KEMET C320C104K5R5TA		Digi-Key www.digikey.com/en/products/result?keywords=… Mouser www.mouser.com/c/?q=C320C104K5R5TA	**Same**	
☐	☐	☐	**1**	SW1	**Pushbutton** momentary, CAL	Omron B3F-1000		Digi-Key www.digikey.com/en/products/result?keywords=… Mouser www.mouser.com/c/?q=B3F-1000	**Same**	

Mechanics

ORD	HAVE	FIT	QTY	REF. DES.	PART / SPECIFICATION	PART NUMBER	ALTERNATES / SUBSTITUTES	WHERE TO BUY	TAG	NOTES
☐	☐	☐	**1**	—	**Tape guide and aperture plates** two plates with a 0.1 in row of 1.5 mm holes, 1 in and 11/16 in channels	–	drill from 3 mm acrylic, or print	make it	**Choice**	The aperture sets the resolution: keep holes ≤ 1.5 mm.
☐	☐	☐	**1**	—	**Perfboard** 0.1 in	–		any supplier	**Choice**	

Orders

VENDOR	ORDER NO.	DATE	TOTAL	RECEIVED	LINES / NOTES

Build total: _____ **Started:** _____ **First power-up:** _____

Notes