

## SYNC SEPARATOR UN1/540 SERIES

### Introduction

The UN1/540 is a sync separator which accepts a composite video signal at 1 volt p-p and provides outputs of:

composite video signal at 1 volt p-p

mixed sync pulses at 2 volts p-p

back-porch pulses, positive-going, at 6 volts p-p.

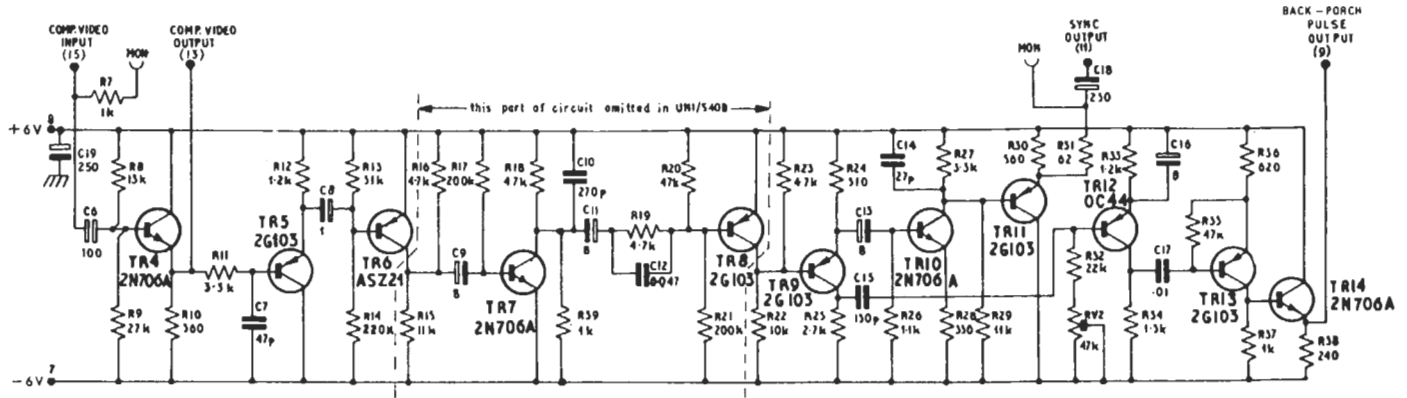
The back porch-pulses are derived from the positive-going transitions in the mixed-sync waveform

The unit contains a power supplier which can provide d.c. outputs at 12 volts (stabilised) and 18 volts (unstabilised) for ancillary equipment<sup>1</sup>.

The unit exists in three versions:

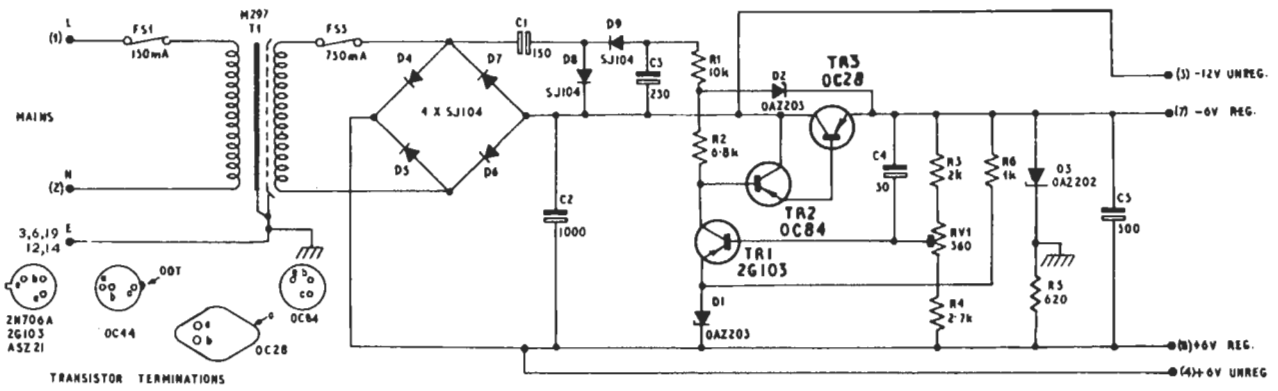
- the basic UN1/540;
- the UN1/540A which was made obsolete by modifications to the UN1/540;
- the UN1/540B in which sync-pulse jitter is improved, but which is more susceptible to noise.

The unit is constructed on a CH1/12A chassis with index peg positions 8 and 30.



UN1/540 from DB12614 iss7 parts list DA 12615  
 UN1/540B from D24594 A4 iss1 parts list DA 2495

Fig. 1. Circuit of the UN1/540



TRANSISTOR TERMINATIONS  
 2N706A  
 2G103  
 ASZ21  
 OC44  
 OC64  
 OC28

UN1/540/1

**General Specification**

<i>Signal Input</i>	composite video signal at standard level
<i>Input Impedance</i>	high-impedance bridging
<i>Signal Outputs</i>	
Mixed syncs	2 volts p-p into 75 ohms
Burst gating pulses	6 volts p-p positive-going, 4 $\mu$ s duration
<i>Power</i>	
Input	240 volts nominal, a.c.
Outputs	12 volts ( $\pm 6$ volts) stabilised 18 volts (+6 volts, -12 volts) unstabilised (Total current must not exceed 500 mA)
<i>Temperature Range</i>	0°C to 40°C ambient
<i>Weight</i>	0.9 kg (2 lb)

**Circuit Description**

The circuits of the UN1/540 and UN1/540B are given in Fig. 1. The circuits are similar except for minor component changes and that the B version omits TR7 and TR8 with ancillary components.

**Sync Separator**

Transistor TR5 is connected as an emitter-follower input stage. Transistors TR6 to TR8 are connected as common-emitter stages which are biased so as to conduct only during the lower portion of the sync-pulses. Resistor R11 and capacitor C7 integrate the video signal thereby reducing the effect of chrominance information which can occur below blanking level. The filter between transistors TR7 and TR8 reduces the effect of noise and hum on the input signal.

Transistor TR9 is used as a phase-splitter. The positive-going sync-pulses at the emitter are inverted by transistor TR10 and fed to the output emitter follower TR11.

**Back-Porch Pulse Generator**

The negative-going sync pulses at the collector of transistor TR10 are differentiated by capacitor C14 and resistors R32 and RV2. The trailing (positive-going) edge cuts off transistor TR12 for a period which is set at 4  $\mu$ s by resistor RV2. A negative-going pulse is produced at the collector of transistor TR12. The pulse, inverted by transistor TR13, is fed to the output emitter follower TR14.

**Power Supplier**

The 12-volt circuit is a conventional stabilised circuit with the collector load resistor R2 of transistor TR1 fed from a zener diode rather than from

the more usual capacitor. The output-terminal potentials (pins 7 and 8) are set by resistor RV1, the voltage balancing circuit resistor R5 and zener diode D3. The 12-volt supply is normally balanced about earth potential (+6 volts and -6 volts). It is possible to earth the negative rail if desired by short-circuiting the zener diode.

The bridge rectifier supplies also an unstabilised output.

**Test Schedule****Apparatus Required**

Avometer Model 8.  
Tektronix oscilloscope Type 535.  
Sine-squared Pulse and Bar Generator GE4/504C.  
10-dB 75-ohm attenuator.  
Source of coded video colour bars.  
Dummy loads: 24 ohms, 6 watts.  
510 ohms, 1 watt.

**Test Procedure**

- Switch on and adjust RV1 to set the voltage between pins 7 and 8 at 12.0 volts. Check that the voltage at pin 8 is 6.0  $\pm$  0.2 volts. Connect the 24-ohm load between pins 7 and 8 and check that the change in voltage between these pins is less than 50 mV. Connect the 510-ohm load between pins 5 and 8. Check that the voltages across the loads are not less than:
 

24-ohm load	11.97 volts.
510-ohm load	17 volts.

 Check that the mains ripple across the 24-ohm load is less than 10 mV p-p. Remove the loads.
- Feed the pulse and bar waveform to the terminated input and connect the unterminated input of the oscilloscope to pin 13. Check that there is no deterioration of the waveform.
- Replace the pulse and bar input with the feed of encoded video colour bars. Connect the terminated input of the oscilloscope to pin 11 and observe the *Sync Output* waveform. Check that sync separation occurs correctly at input levels of +6 dB, 0 dB and -10 dB. The amplitude of the waveform should be 2.0  $\pm$  0.2 volts p-p. With an input level of 0 dB, check that the rise time of the output waveform is less than 250 ns.
- Connect the unterminated input of the oscilloscope to pin 9. Adjust resistor RV2 to give a pulse width of 4  $\mu$ s. Measure the pulse amplitude which should be 6.0  $\pm$  0.5 volts.

**References to Typical Associated Equipment**

- Burst Locked Oscillators OS1/502, OS1/513, OS1/519.