CAPTION PULSE GENERATORS GE2/526 and GE2/526A

Introduction

The GE2/526 and GE2/526A accept a standard video signal, a B-Y video signal or a monochrome letter caption signal and produce a switching waveform for driving associated video switching equipment[1,2]. Also provided is an output of correctly shaped letter pulses for caption overlay infill. The ' holes ' cut in the main picture by the caption waveform can be varied in width in three steps and the letter signals may be positioned in the ' holes ' so that black edges may be formed before and after the vertical edges. The two units are identical except for the polarity of the output switching pulses.

The units are constructed on CH1/12A chassis with index pegs 27 and 28. An external 12-volt supply with negative earth is required.

General Specification

Input Signal (standard waveform)	1 V p-p
Input Clamp Pulses, negative going	4·4 V p-p
Switching Pulse Output, GE2/526 negative going, GE2/526A positive going	1·7 V p-p
Letter Pulse Output (into high impedance)	0·5 V to 0·7 V

Circuit Description

The circuit diagrams are given in Fig. 1 and Fig. 2. The waveforms indicated in the inserts are those to be expected when testing the unit with a sawtooth. The video input, normally generated from white letters on a black background, is applied to terminal 3. Transistors TR1, TR2 and TR3 amplify the signal and provide a low impedance feed to the base of TR4 which is clamped at approximately 4 volts by TR20 and TR21. TR4 and TR5 form a buffer stage, presenting a high impedance to the clamp and, with R16, provide an input match to the delay line DN1.

The clamp pulse input to terminal 4 is produced in an associated unit and consists of a negative-going spike corresponding to the trailing edge of syncs (see inserts on the circuit diagram). TR18 with TR19 clean up both ends of the signal and feed a 9·5 volt pulse to the clamp. The clamping potential, approximately 4 volts, is supplied from an external source via terminal 10.

TR5 feeds TR6 directly and transistors TR7 to TR11 via taps on the delay line. These transistors operate in class A and feed the diode gates D1/2 to D19/20. D1/2, D5/6, D9/10 and D13/14 gate the signal to TR12 depending on the presence of a 12-volt d.c. bias at one of the inputs 6 to 9. The bias is supplied from an associated unit[2].

The gate D3/4 and (depending on the presence of a 12-volt bias on one of terminals 11, 12 or 13), the gates D7/8, D11/12, D15/16 and D19/20 pass the signal from the delay-line transistors to the switching-pulse forming circuit, TR22 to TR25. Diodes 3 and 4 are normally conductive; D3 conducts via R20 and TR6 to E, D4 via R20, D22 and R66. Thus any signal on the base of TR6 is passed direct to TR22. In the absence of any bias on terminals 6 to 9 and 11 to 13, the signal at the base of TR22 is an exact copy of that on the base of TR6 except for a slight shift in the d.c. level due to the base emitter potential of TR6. D22 provides temperature compensation.

TR22 and TR23 form a clipping/limiting circuit. TR22 is cut off except during the positive-going swing of the signal. As the potential at the emitters of TR22 and TR23 moves positively, TR23 starts to conduct when the emitter potential passes that of the base which is held constant by R69, R70 and C9. The output signal at the collector of TR23 is limited in both directions, as indicated in the insert on Fig. 1 for a sawtooth test signal. This signal is inverted by TR24 and appears at the output terminal 5 as a negative-going switching pulse.

If there is a 12-V bias on (say) terminal 12, then gates D7/8 and D11/12 are open and the signal to TR22 is held on until the trailing edge passes TR9. Thus the duration of the output switching signal at terminal 5 is increased.

If there is bias on one of terminals 6 to 9 then the corresponding gate, say D5/9, is open and the letter signal passes, with 0·1 μs delay, from the emitter of TR7 to the base of TR12. TR12/13 strip the syncs and TR14/15/16 limit the white-level excursion; R48 gives some control of the amplitude of the output letter pulse at terminal 15

The switching pulse from TR25 causes an associated video switch to change over to the caption signal channel fed from terminal 15, but as the change over occurs before the arrival of the letter signal and persists for longer (due to the delay introduced by the delay line DN1) the letter has black vertical edges which can be widened as the bias is moved from terminal 11 to terminal 13. The position of the letter in the 'hole' can be altered according to which one of the letter gates is opened by bias.

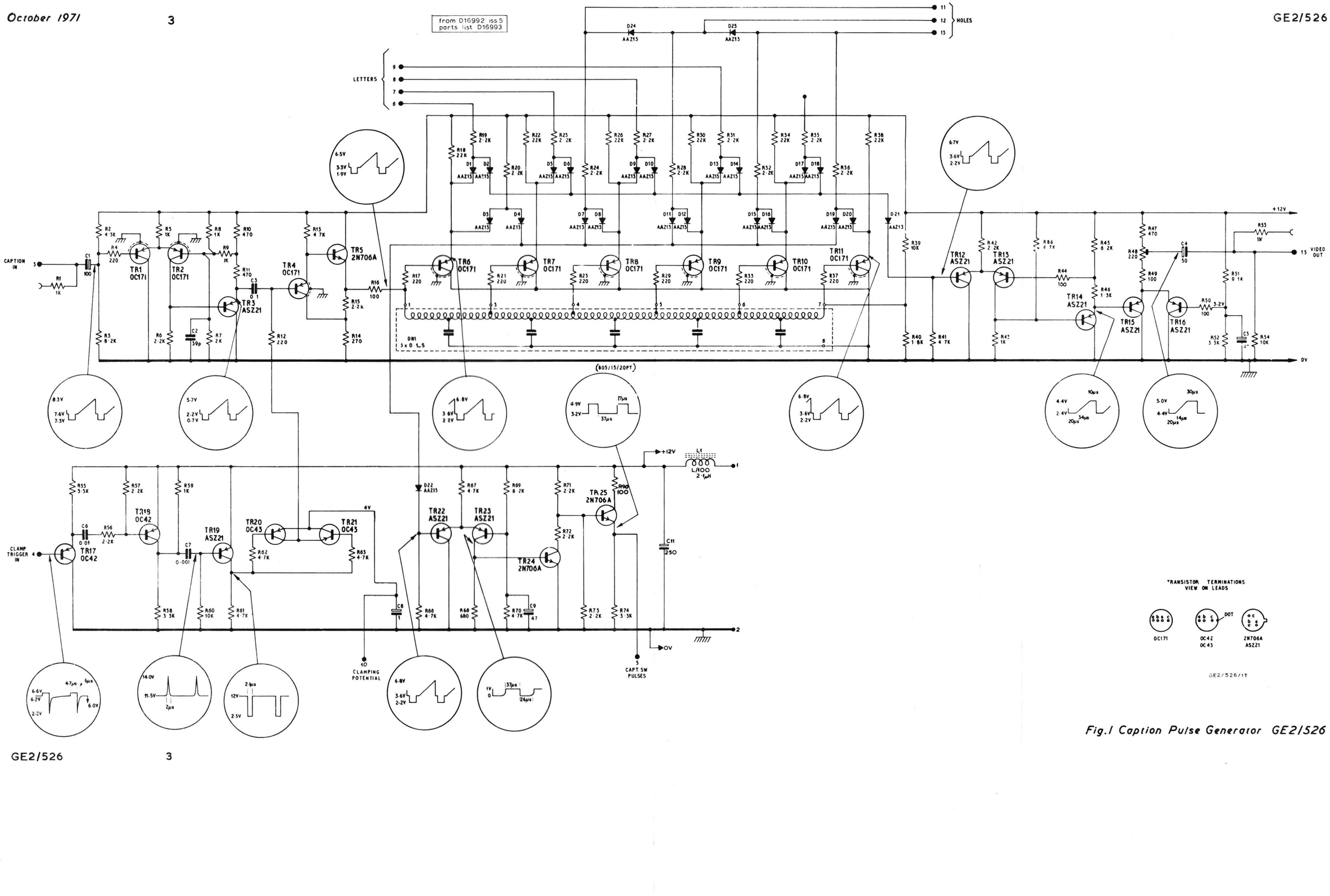
The GE2/526A is identical with the GE2/526 except that TR24 in the GE2/526 becomes an emitter follower and TR25 is omitted.

Maintenance

Routine maintenance is not required. Overall checks should be made in conjunction with the parent unit[1,2]. The unit may be tested in isolation if clamp trigger pulses are applied to terminal 4 and a standard 1-volt sawtooth signal to terminal 3. These two signals must, of course, be synchronous. A 12-volt (negative earth) power supply is required. The waveforms to be expected are indicated in the inserts on Figs. 1 and 2.

References

1. UN4/502B and C for GE2/526.
2. PA18M/518 for GE2/526A.
3. Designs Department Specification No. 8.20 (66)

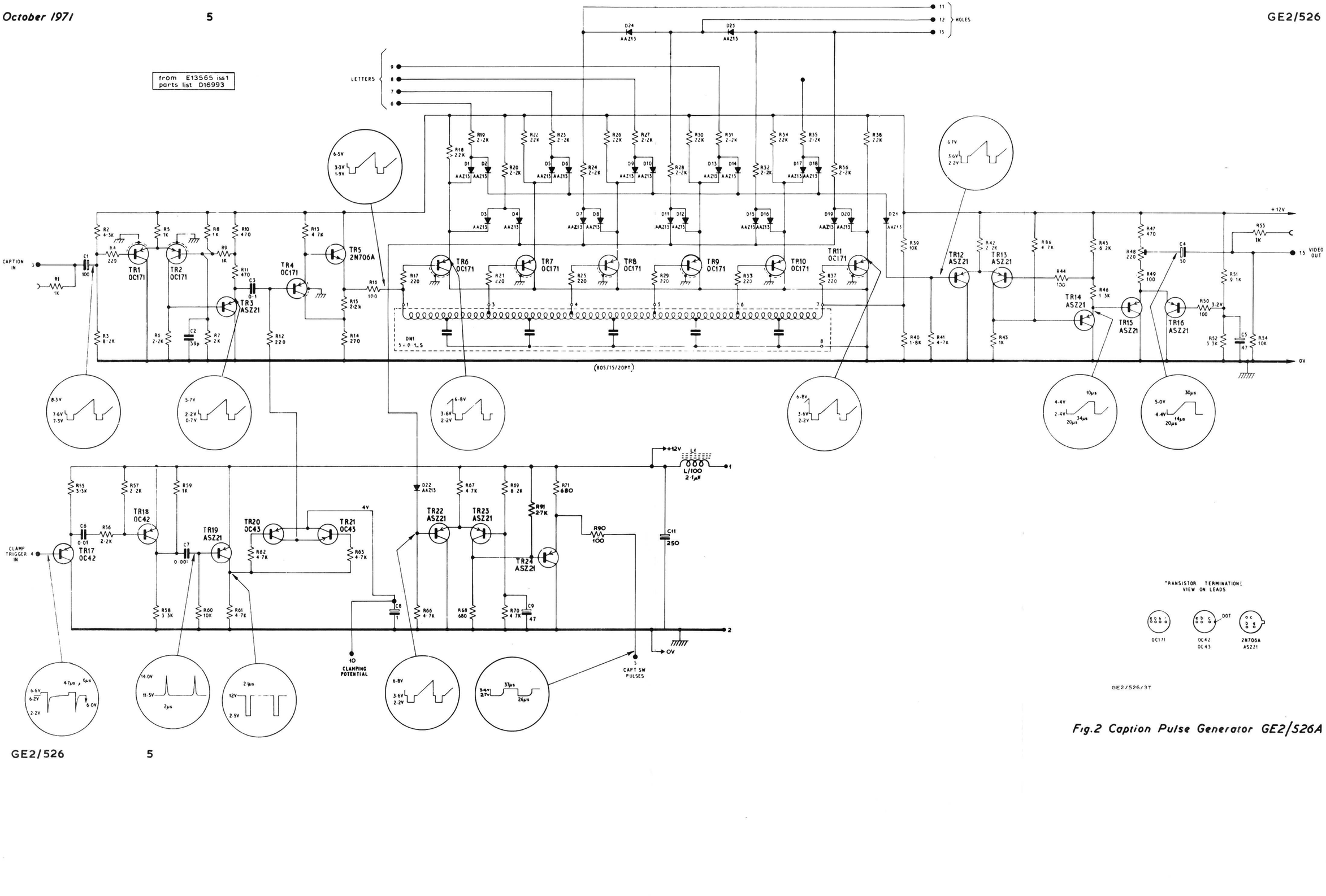


TRANSISTOR TERMINATIONS
VIEW ON LEADS

GE2/526/1T

Fig.1 Caption Pulse Generator GE2/526

from E13565 iss1
parts list D16993



TRANSISTOR TERMINATIONS VIEW ON LEADS

GE2/526/3T

Fig.2 Caption Pulse Generator GE2/526A