DIFFERENCE AMPLIFIER AM1/541

Introduction

The AM1/541 accepts up to three video input signals and provides a variety of output signals[1] which are derived either from the input signals or from an internal calibration-waveform generator. It provides also a d.c. control signal which can be used for the remote operation of an associated clamp unit[2].

The unit contains:

A difference amplifier.

A calibration-waveform generator (together with a calibrated attenuator).

A monitor amplifier.

A stabilised power supplier, which supplies power at +8 volts and −12 volts to the rest of the unit.

The unit is constructed on a CH1/12C chassis with index-peg positions 14 and 28. The three video input connectors are located on the front panel of the unit together with *Mode*, *Select B*, *Gain* and *Clamp On/Off* switches, a calibrated attenuator and a star indicator associated with the *Clamp* switch. Note that the *Gain* switch controls an external distribution amplifier[3] and has no effect on the AM1/541.

General Specification

Gain	0 db or (with external distribution amplifier) 6 dB
Input Impedance (difference amplifier)	75 ohms
Input Impedance (monitor amplifier)	75 kilohms
Output Impedance (difference amplifier)	75 ohms
Max. Output Signal (difference amplifier)	2·8 volts p-p 10-kHz sine-wave
Amplitude/Frequency Response (relative to response at 10kHz)	±0·1 dB at 4·43 MHz ±3 dB up to 15MHz
Pulse to Bar Ratio	within 3%
Calibrator Accuracy	±0·1 dB

Circuit Description

The circuit diagram is shown in Fig. 1 on page 3.

Calibrator

A square-wave signal at a frequency of about 9 kHz is generated in an astable multivibrator comprising transistors TR4 and TR5. This signal is then applied via emitter-follower TR6 to clipper stage TR7. From TR7 the clipped signal is fed to the complementary feedback amplifier comprising transistors TR8 and TR9. Zener diode D6 stabilises the bias of TR9.

The output of the feedback amplifier is applied via variable resistor RV1 and a ladder attenuator to the 1-volt, 0·7-volt and 0·3-volt contacts of switch SB1. Variable resistor RV1 forms a continuously-variable attenuator and is calibrated from −1 dB to +1 dB.

Difference Amplifier

The two input stages of the difference amplifier are formed by emitter-coupled transistors TR10 and TR11. The signal appearing at the emitter of TR10 is applied, via a bridged-T network, to the emitter of TR11: thus the signal appearing at the collector of TR11 is the difference of the two input signals. Preset resistor RV3 is adjusted for low-frequency balance and capacitor C13 for high-frequency balance. Preset resistor RV2 is adjusted on test for zero d.c. at the output of the amplifier.

From the collector of TR11 the difference signal is applied, via complementary emitter-followers TR12 and TR13 and the switching system, either directly to the associated clamp unit[2] or to the clamp unit via an external distribution amplifier[3].

Monitor Amplifier

This amplifier is fed from the A (Green) input to the unit at all times, regardless of the settings of the front-panel switches. It consists of two complementary emitter-follower stages, transistors TR14 and TR15, connected in cascade. The output of the amplifier feeds a trigger unit[4].

Power Supplier

Power supplies at +8 volts and −12 volts are derived from a conventional stabiliser circuit comprising transistors TR1 to TR3. The shunt amplifier TR1 compares any load variations in the −12 volt line with a reference voltage derived

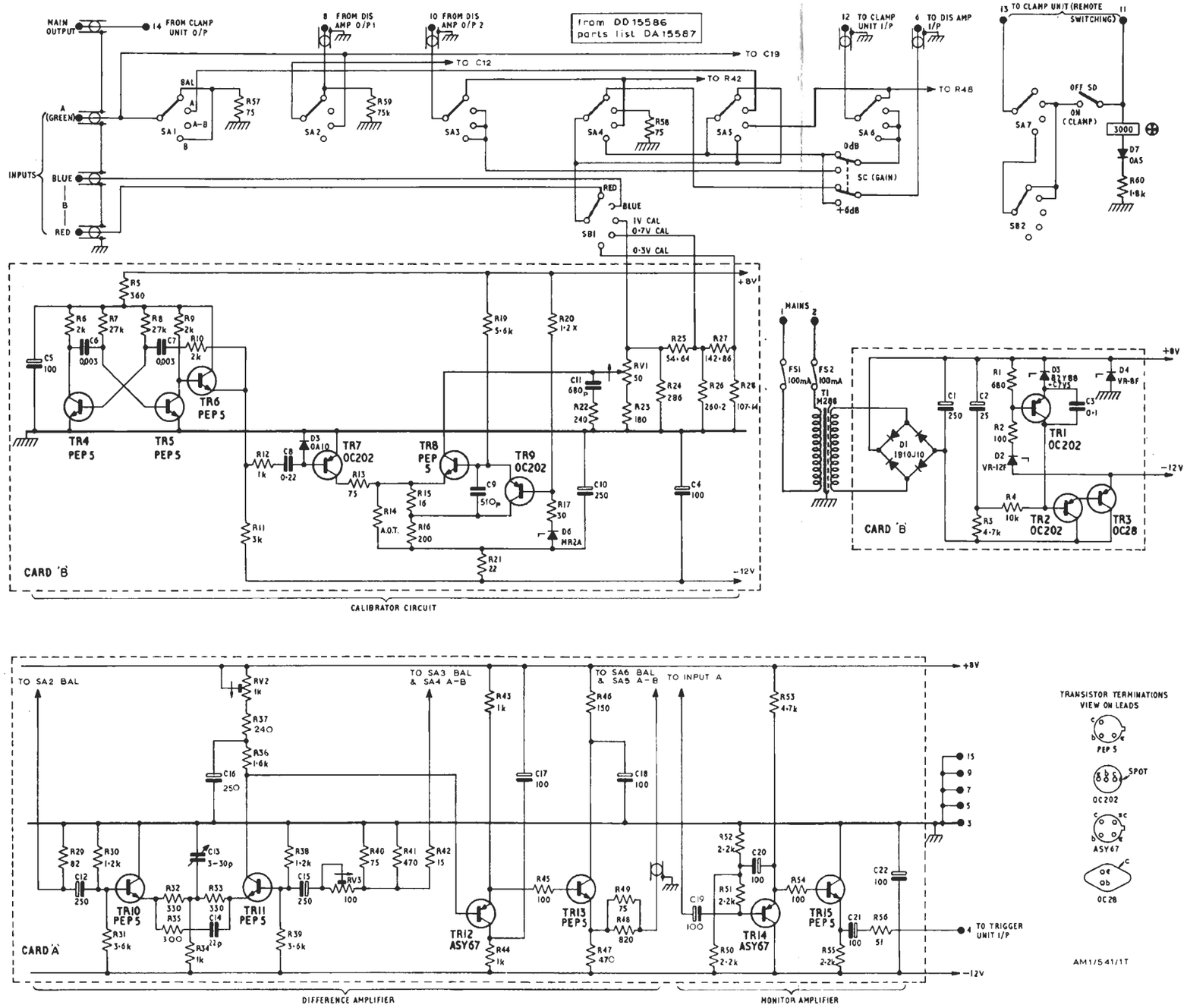

Fig. 1. Circuit of the AM1/541