

VIDEO MATRIX OUTPUT AMPLIFIER
AM1/512

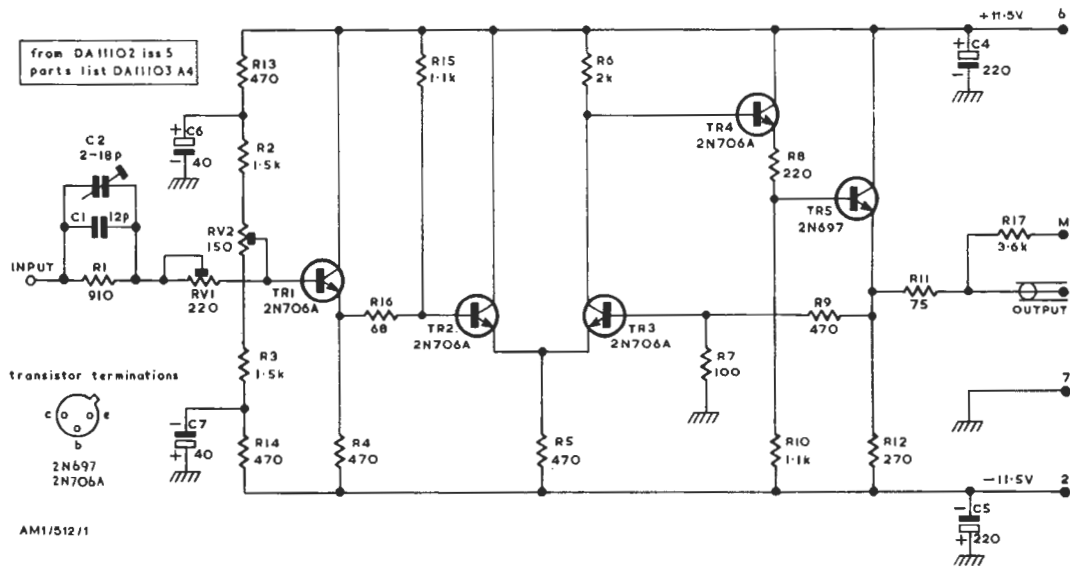


Fig. 1. Circuit of the AM1/512

Introduction

The AM1/512 was designed as an isolating amplifier to accept the video signal from an output bus-bar of a Matrix Unit PA9/504 and to provide a 75-ohm output. The amplifier is constructed on a special chassis which is bolted to the frame of the Matrix Unit.

Circuit Description

The circuit of the AM1/512 is given in Fig. 1. This is a direct-coupled amplifier using silicon npn transistors. The input impedance is 1.8 kilohms and the output impedance is 75 ohms.

The input signal is fed through R1 and RV1 to the base of the emitter-follower TR1. R1 provides isolation for other destinations in the event of amplifier failure and RV1 controls the effective gain of the amplifier. C1 gives high frequency compensation for the input capacitance of TR1. RV2 provides a means of varying the base potential of TR1 and it is adjusted to set the mean potential at the output of the amplifier to zero volts when zero volts are applied to the input.

It is also necessary to maintain the mean potential at the base of TR1 at zero volts to ensure that, when a source is connected to the amplifier, a voltage step is not fed back through the relay contacts to the input bus-bar and thence to other destinations connected to the same source. This is achieved by the use of a suitable coupling circuit between transistors TR1 and TR2. A direct con-

nection is made through resistor R16 and there is also a connection from the base of TR2 to the positive line through R15; this enables the bases of TR1 and TR2 to be at zero volts simultaneously because the voltage drop across R16 compensates for the potential difference between the base and emitter of TR1.

TR2 and TR3 form an emitter-coupled pair and the signal developed across the collector load of TR3 is applied to the base of TR4. The emitter of TR4 is connected to the base of TR5 and the two transistors together form a compound emitter-follower output stage. Negative feedback from the emitter of TR5 is applied to the base of TR3; this feedback reduces the impedance at the emitter of TR5 to a fraction of an ohm and so the effective output impedance of the amplifier, provided by R11, is 75 ohms.

Since the base of TR3 is at roughly zero potential it is desirable to set the collector to a positive potential great enough to prevent large negative signal swings from causing TR3 to bottom. This is achieved by the choice of values for R8 and R10; these are such that the mean potential on the emitter of TR4 is 2.9 volts and the mean potential on the base of TR4, and hence the collector of TR3, is 3.5 volts.

A balanced power supply of ± 11.5 volts is required. Because of the resistance of fuses the supply rails are decoupled to earth. Current consumption is 110 mA from each rail.

TES 9/65