

SECTION 3

ERROR SIGNAL AMPLIFIER AM3/503

Introduction

The AM3/503 forms the sampling section of a feedback clamp^{1,2}. From a composite video signal and feeds of sampling pulses³ it provides a d.c. output for use in the associated processing amplifier⁴.

The unit is constructed on a CH1/12 chassis with index peg positions 7 and 27. Power supplies at +12 volts, +4 volts and -4 volts are obtained from a stabilised power supplier⁵.

General Specification

The specification is given, in conjunction with associated units, under the AM18/513¹.

Circuit Description

General

A circuit diagram is shown in Fig. 3.1. The AM3/503 is very similar to the AM3/501 (described under AM18/509); therefore only that part of the circuit which differs from the earlier unit will be described.

Fast Correction Circuit

Transistors TR6 and TR7, together with their associated components, form a circuit which reduces the effective time-constant of the clamp if a large error signal occurs. The correct black-level is rapidly re-established by artificially charging or discharging C15 from a low-impedance source, as described below.

When diode bridge D7-D10 conducts C15 charges through R23 and, at the same time, C16 charges through R27. (The time-constant of C16-R27 is very much shorter than that of C15-R23.) The potential developed across C16 is applied to the complementary emitter-follower TR6-TR7; the base-to-emitter potentials of the transistors are of opposite polarity and tend to cancel. In practice the potential drop across TR7 is slightly greater than that across TR6 and this is compensated for

by the potential divider R29-R30.

Four diodes, connected between TR7 emitter and C15, form a network which does not conduct in either direction until there is a potential difference across it of 0.6 volts. Under normal conditions this difference does not exist and the TR6-TR7 circuit does not affect the operation of the clamp. However, immediately after a cut from, say, a black scene to a white scene the potential at the base of TR4 starts to move in a positive direction. Using the C15-R23 time-constant it would take about 20 lines (30 on 625) to reach the correct potential for an all-white picture. However, the C16-R27 time-constant is very much shorter and after 2 lines (3 on 625) TR7 emitter has moved far enough positive for D13-D14 to conduct and C15 charges rapidly to the correct potential. As soon as this potential is reached the flow of line-frequency positive-going error pulses through the sampling bridge stops. Diodes D13 and D14 stop conducting and the clamp returns to the normal C15-R23 time constant.

When a cut from a white scene to a black scene takes place all the potentials concerned move in the opposite direction. After an interval of two lines diodes D11 and D12 conduct to bring about the required rapid change in the potential of C15.

Maintenance and Alignment

See AM18/513. The waveforms and potentials shown in Fig. 3.1 are for 405-line operation and represent conditions when the unit is functioning as part of a stabilising amplifier.

References to Typical Associated Equipment

1. Sync Pulse Stabilising Amplifier AM18/513.
2. Instruction V.2, Section 9, Appendix B.
3. Pulse Generator GE2/519, Instruction V.10.
4. Processing Amplifier AM18/514.
5. Stabilised Power Supplier PS2/10A, Instruction G.2.

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See page 3.3 for Fig. 3.1

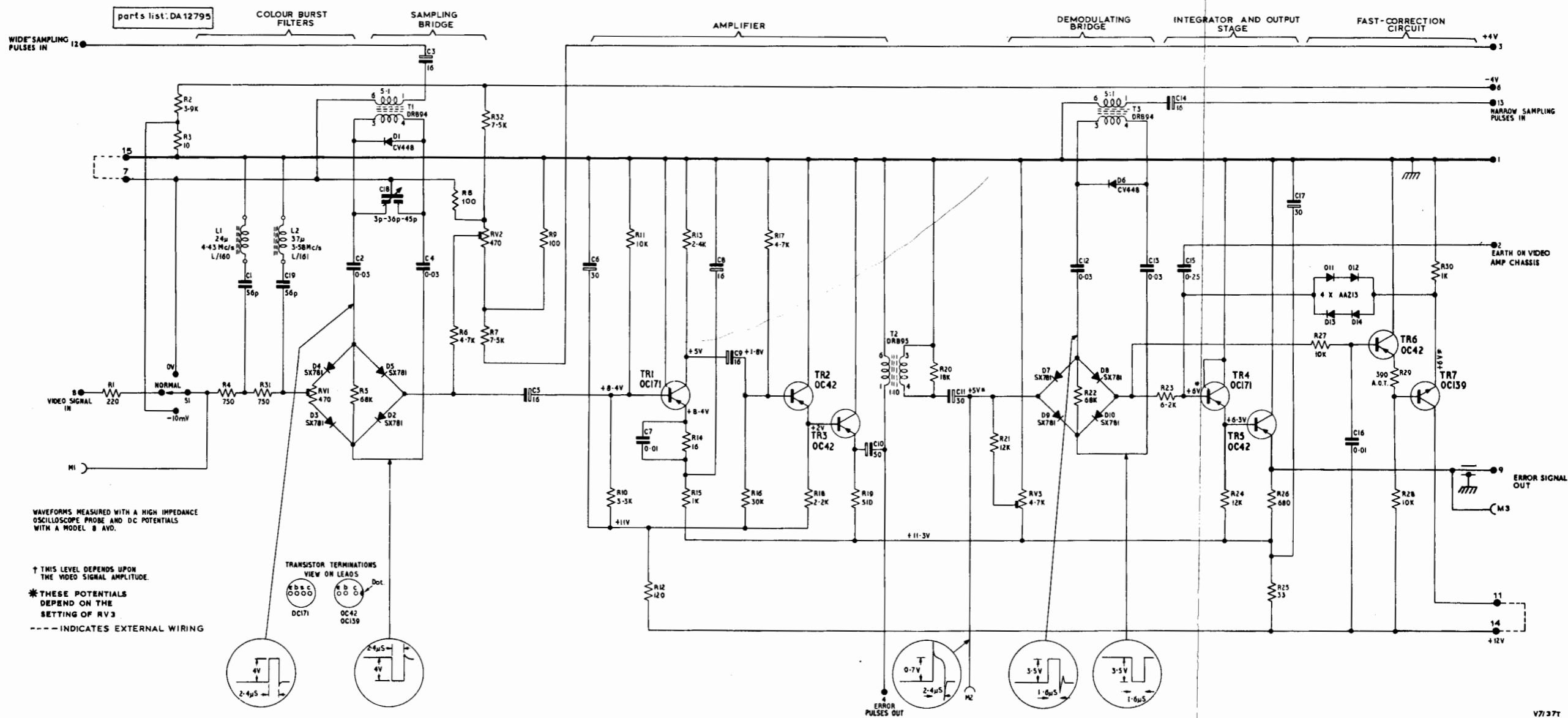


Fig. 3.1 Circuit of the AM3/503