

TELECINE COMMAG RELAY AND METERING UNIT UN1/59

Introduction

The UN1/59 forms part of a telecine machine^{1,2} and performs two functions:

- (a) the relay section of the unit performs specific switching functions in the correct sequence to enable a Commag recording to be made.
- (b) the metering section of the unit measures either the Commag recording-head current or the Commag erase-head current. Normally the meter measures the recording head current, but the erase head current can be measured instead by pressing a non-locking pushbutton on the front panel of the unit.

For Commag working one head, known as the programme head, combines the functions of the recording and reproducing heads. The term recording head is used here for the sake of clarity.

The unit is mounted on a CH1/18C chassis with index-peg positions 18 and 24. Power supplies at 24 volts and 50 volts are required.

General Description

Relay Section

The relay section of the unit is required to:

- (a) Operate the erase-head solenoid to bring the erase head into contact with the film.
Operate the programme-head solenoid if it is not already operated.
- (b) Short-circuit the associated reproducing amplifier. (This is necessary to prevent cross-talk from the recording amplifier being fed to line via the reproducing amplifier. This cross-talk is mainly caused by capacitance between the contacts of the programme head change-over relay).
- (c) Change over the programme head from the reproducing amplifier to the recording amplifier.
- (d) Remove a short-circuit from the recording amplifier output. (This short-circuit is required during reproduction to prevent cross-talk from the recording amplifier to the reproducing amplifier if programme is inadvertently connected to the recording amplifier input).
- (e) Apply bias and erase currents to the programme and erase heads respectively by

connecting power to the bias and erase oscillator.

- (f) Indicate that the sequence of operations is completed and that the telecine machine is in the recording mode.

The operations are carried out in the reverse order when the recording mode is cancelled.

Metering Section

A voltage proportional to the current flowing in the recording head is generated across a resistor in series with the head. A voltage proportional to the current flowing in the erase head is generated in the same manner. The voltage selected for monitoring is applied via the pushbutton to the metering circuit where it is amplified, rectified and fed to the meter.

Circuit Description

The circuit diagram of the UN1/59 is shown in Fig. 1.

Relay Circuit

The relay circuit is described below in tabular form.

Relay	Function
RLA	Energised (after a 10 to 20 ms delay caused by R9 and C5) when an earth is applied to PLB pin 8. RLA-1 applies power to RLB and RLA-2 applies an earth to PLB pin 11 to operate the heads solenoid unit.
RLB	Energised (after a 10 to 20 ms delay) by the operation of RLA-1. RLB-1 applies power to RLC; RLB-2 energises RLBA. The earth path for relay RLA is now via RLBA instead of via PLB pin 8.
RLBA	Energised by the operation of RLB-2. RLBA-1 applies a short-circuit to the reproducing amplifier; RLBA-2 is not used.
RLC	Energised (after a 10 to 20 ms delay) by the operation of RLB-1. RLC-1 applies power to RLD; RLC-2 energises relay RLCA (mounted on the rear of the associated PA1M/49 panel). The earth path for relay RLB is now via RLCA instead of via PLB pin 8.

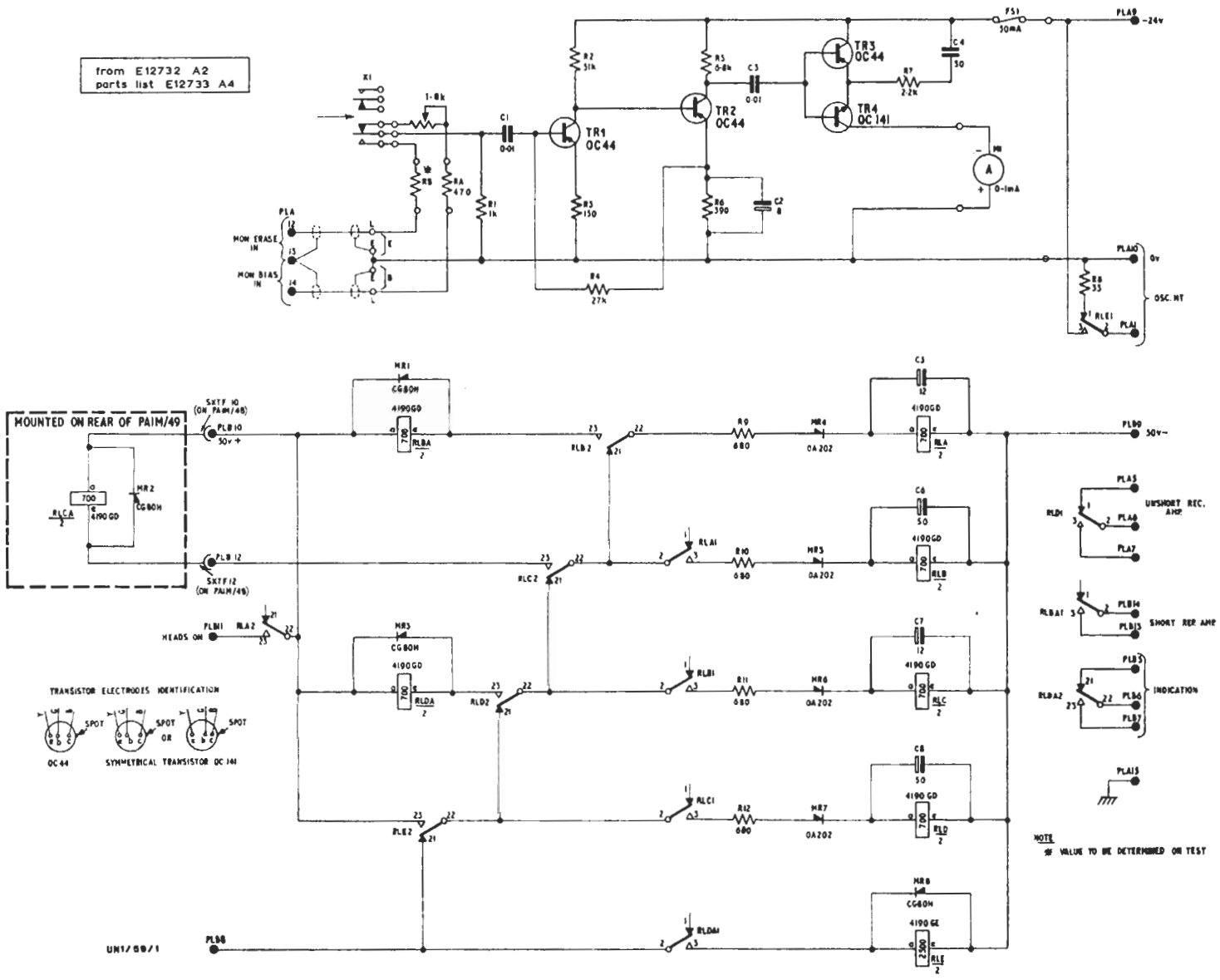


Fig. 1 Circuit of the Metering Unit UN1/59

- RLCA** Energised by the operation of RLC-2. The contacts of this relay (not shown in Fig. 1) change over the programme head from the reproducing amplifier to the recording amplifier.
- RLD** Energised (after a 10 to 20 ms delay) by the operation of RLC-1. RLD-1 removes the short-circuit from the recording amplifier output; RLD-2 energises RLDA. The earth path for relay RLC is now via RLDA instead of via PLB pin 8.
- RLDA** Energised by the operation of RLD-2. RLDA-1 energises RLE; RLDA-2 gives an indication that the apparatus is in the record mode.
- RLE** Energised by the operation of RLDA-1. RLE-1 applies power to the bias and erase oscillator; RLE-2 changes the earth path of RLD from PLB pin 8 to PLB pin 10.

Metering Circuit

The selected input signal is amplified in a feedback amplifier comprising transistors TR1 and TR2 and is then applied to the complementary transistors TR3 and TR4. When the input is positive-going, TR4 conducts and a current flows through the meter and R7 to charge C4; when the input is negative-going, TR3 conducts and discharges C4. Thus the signal is rectified by the action of the two transistors and the meter deflection is proportional to the input voltage.

Resistor RA is connected in series with a variable resistor so that the bias reading can be reset to half-scale deflection for different recording stocks. Resistor RB is adjusted on test so that the correct erase current gives half-scale deflection of the meter.

References

1. 16-mm Vidicon Telecine EP6/501 (see Designs Dept. Technical Memorandum No. 7.133).
2. 16-mm Colour Telecine Equipment EP6/505.

TES 10/68