

TR 101

VIDEO TWISTED-PAIR RECEIVER

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This unit is produced to comply with Directive 89/336/EEC.

PREFACE

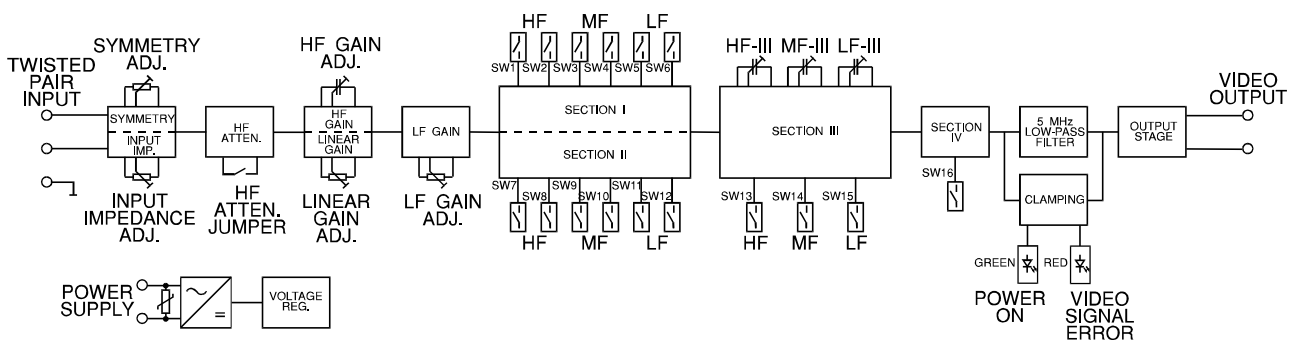
The video twisted-pair receiver TR 101 is a correction amplifier with symmetrical input and the standard asymmetrical video output. It is mounted in ABS casing. The numerous trimmers help to adjust the input impedance, symmetry, linear gain

and rough or fine gain adjustment at different frequencies. There are LED1 and LED2 which indicate the power-on and the video signal error in the video input of the receiver.

FEATURES

- small dimensions
- AC/DC power supply
- low power consumption
- over-voltage protection
- max. +60 dB gain at 5 MHz

BLOCK DIAGRAM



PRINCIPLE OF OPERATION

The input stage enables the setting of the input impedance and symmetry.

The minimal high frequency gain is 6 dB and the high frequency attenuation should be switched-on at short distances.

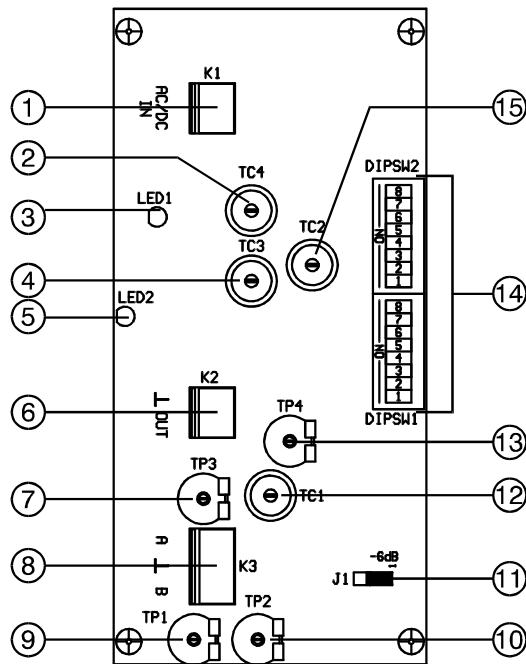
The next two stages enable the linear gain adjustment and the square-wave response adjustment. There follow the filter stages with sixteen switches and their adequate elements for the fine adjustment with total gain from +6 to +60 dB.

In the end there are the low-pass filter and the clamping circuit with the indication of power-on (the green LED) and the video-signal-error indication (the red LED).

With the help of the output stage the standard video output with the impedance of 75 ohm is achieved.

The power is supplied by connecting to the AC or DC power supply unit.

CONTROLS AND CONNECTORS



(1) AC/DC POWER SUPPLY

Power supply terminal block connector.

(2) TC 4

LF-III fine adjustment trimmer.

(3) LED 1

Red LED for video signal error indicator.

(4) TC 3

MF-III fine adjustment trimmer.

(5) LED 2

Green LED as power-on indicator.

(6) VIDEO OUTPUT

Video output terminal block connector.

(7) TP 3

Linear gain adjustment trimmer.

(8) TWISTED-PAIR INPUT

Twisted-pair terminal block connector.

(9) TP 1

Input impedance adjustment trimmer.

(10) TP 2

Symmetry adjustment trimmer.

(11) J 1

HF attenuation (short distance) jumper.

(12) TC 1

HF gain adjustment trimmer.

(13) TP 4

LF gain adjustment trimmer.

(14) SW1-SW16

LF/MF/HF gain switches.

DIPSW2

| | |
|---|---------------|
| 8 | SW16 - HF-V |
| 7 | SW15 - LF-III |
| 6 | SW14 - MF-III |
| 5 | SW13 - HF-III |
| 4 | SW12 - LF-II |
| 3 | SW11 - LF-II |
| 2 | SW10 - MF-II |
| 1 | SW 9 - MF-II |

DIPSW1

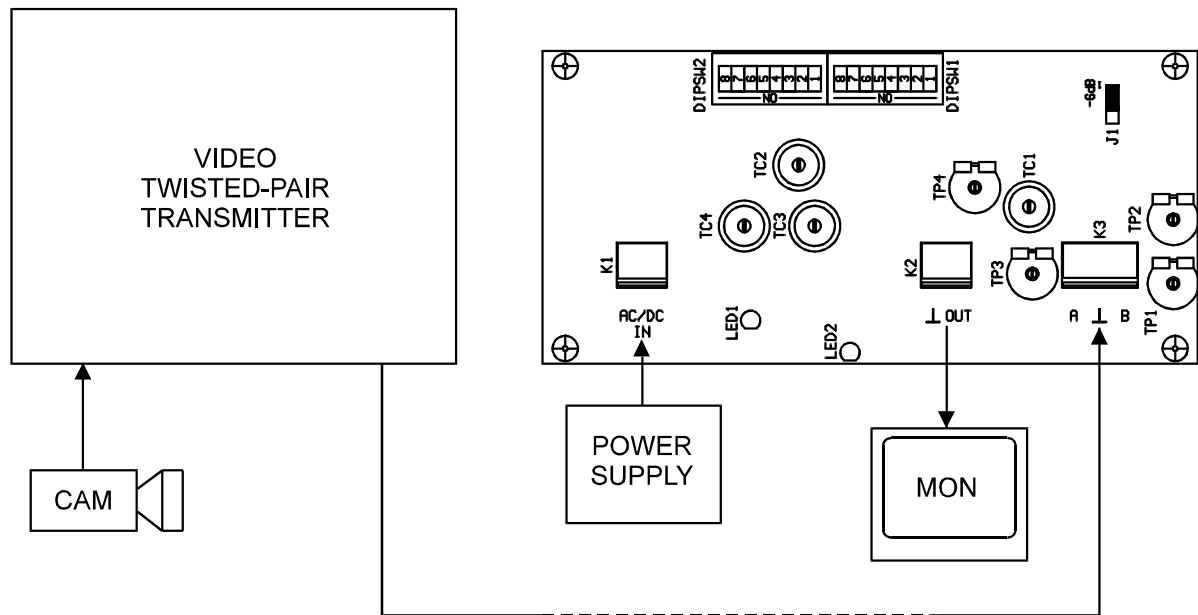
| | |
|---|--------------|
| 8 | SW 8 - HF-II |
| 7 | SW 7 - HF-II |
| 6 | SW 6 - LF-I |
| 5 | SW 5 - LF-I |
| 4 | SW 4 - MF-I |
| 3 | SW 3 - MF-I |
| 2 | SW 2 - HF-I |
| 1 | SW 1 - HF-I |

(15) TC 2

HF-III fine adjustment trimmer.

CONNECTIONS

- Be sure to switch-off the power supply unit before connecting to other equipment.
- Also refer to the instruction manual of the equipment to be connected.



INSTALLATION

- (1) Set the trimmer **TP2** to the middle position.
- (2) Set the trimmer **TP3** to the middle position.
- (3) Set the trimmer **TP4** to the left.
- (4) Switch-off **SW1-SW15**, **SW16** switch-on.
- (5) Set **TC1**, **TC2**, **TC3** and **TC4** to the minimal capacitance.
- (6) In the **Table 1** select the **CABLE** (insulation, impedance Z_L , loss $a_{5\text{MHz}}/\text{km}$) and calculate the cable loss $a_{5\text{MHz}}$. (see **Example 1** and **Example 2**)
- (7) Set the trimmer **TP1** - measure with ohm-meter between **A** and **B**.
Adjust resistance between **A** and **B** to achieve cable impedance Z_L . ($R_{AB} = Z_L$)
- (8) Switch-on the adequate switches (**Table 1**) to compensate the cable loss $a_{5\text{MHz}}$.
In the **SECTION I** or **SECTION II** only one group of switches (**10dB** or **20dB**) can be switched-on in the same time. (see **Example 1** and **Example 2**)
- (9) Connect the power supply unit (AC or DC) to the **K1**.
- (10) Connect the video monitor to the video output **K2**.
- (11) Connect the twisted-pair cable to the **K3**.
- (12) Switch-on the power supply units.
LED2 (green) lights, power supply is switched-on.
If there is a video signal at the input, **LED1** (red) doesn't light.
- (13) Switch-on the video monitor.
- (14) Check the positive video input signal between **A** and \wedge .
- (15) Check the negative video input signal between **B** and \wedge .
- (16) Set the output video signal to 1 Vpp - trimmer **TP3**.
- (17) Do the fine adjustment with **TC2**, **TC3**, **TC4**, correct the sync. pulse with **TP4**, **TC1**. (**Fig. 1**)
- (18) If adjustment with **TC2**, **TC3**, **TC4** is not possible, switch-on **SW13**, **SW14**, **SW15** and do the fine adjustment.
- (19) Set the minimal disturbance - trimmer **TP2**.
- (20) Correct the output video signal to 1 Vpp - trimmer **TP3**.
- (21) If there is too much noise in the signal (gain adj. > 50 dB at 5 MHz), set the pre-emphasis to **+10 dB** in the video twisted-pair transmitter.
- (22) If $a < 6$ dB (short distance), **SW1-SW15** switch-off, **SW16** switch-on, jumper **J1** set to **- 6 dB** and do the fine adjustment.

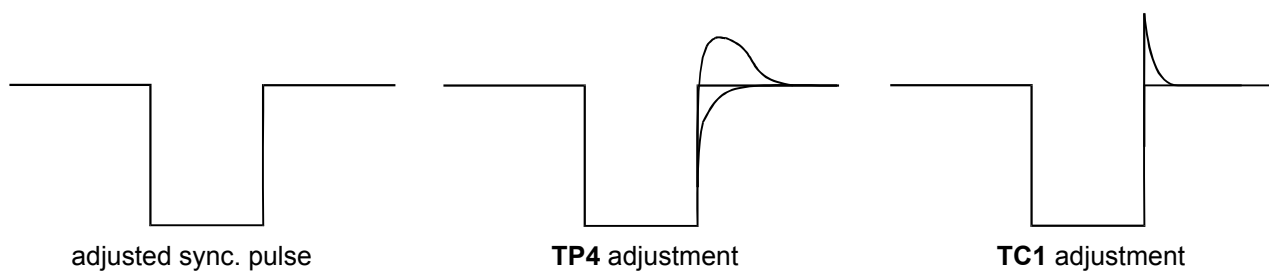


Fig. 1: Sync. pulse correction

Table 1

| CABLE | | | | SECTION I (SW1-SW6) | | SECTION II (SW7-SW12) | |
|------------|------------|---------|----------------------|---------------------|-------------|-----------------------|----------------|
| TYPE | INSULATION | Z_L/W | $a_{5\text{MHz/km}}$ | 10 dB | 20 dB | 10 dB | 20 dB |
| P | paper | 150 | 51 dB | 2 4 | 1 2 6 | 8 10 | 7 8 12 |
| P | paper | 125 | 35 dB | 2 4 6 | 1 2 5 | 8 10 12 | 7 8 11 |
| P | paper | 125 | 33 dB | 2 4 6 | 1 2 4 5 | 8 10 12 | 7 8 10 11 |
| P | paper | 125 | 30 dB | 2 4 6 | 1 2 4 5 | 8 10 12 | 7 8 10 11 |
| Y | PVC | 90 | 65 dB | 2 4 6 | 1 2 4 5 | 8 10 12 | 7 8 10 11 |
| Y | PVC | 100 | 40 dB | 2 4 6 | 1 2 3 5 | 8 10 12 | 7 8 9 11 |
| 2Y,2YF | PE | 130 | 40 dB | 2 4 6 | 1 2 5 | 8 10 12 | 7 8 11 |
| 2Y,2YF,02Y | PE | 135 | 30 dB | 2 4 6 | 1 2 4 5 | 8 10 12 | 7 8 10 11 |
| 2Y,2YF,02Y | PE | 135 | 24 dB | 2 4 5 | 1 2 3 4 5 6 | 8 10 11 | 7 8 9 10 11 12 |
| 02Y | PE | 140 | 21 dB | 2 4 5 | 1 2 3 4 5 6 | 8 10 11 | 7 8 9 10 11 12 |

Example 1:

Cable specifications: $Z_L=125 \Omega$, $a_{5\text{MHz/km}}=30 \text{ dB}$, paper insulation, cable length $L=500 \text{ m}$.

(1) $a_{5\text{MHz}}=a_{5\text{MHz/km}} \times L=15 \text{ dB}$

(2) In **Table 1** find column **10 dB** in **SECTION I** or in **SECTION II**.

Switch-on the switches 2, 4 and 6 or 8, 10 and 12 (page 5).

(3) Do the fine adjustment (+5 dB) with TC1, TC2, TC3, TC4 and TP4.

Example 2:

Cable specifications: $Z_L=100 \Omega$, $a_{5\text{MHz/km}}=40 \text{ dB}$, PVC insulation, cable length $L=1000 \text{ m}$.

(1) $a_{5\text{MHz}}=a_{5\text{MHz/km}} \times L=40 \text{ dB}$

(2) In **Table 1** find column **20 dB** in **SECTION I** and in **SECTION II**.

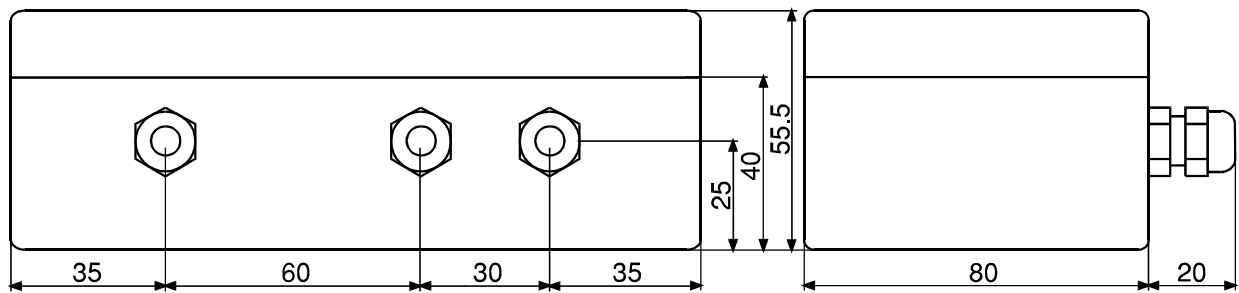
Switch-on the switches 1, 2, 3, 5, 7, 8, 9, and 11 (page 5).

(3) Do the fine adjustment with TC1, TC2, TC3, TC4 and TP4.

Note:

- It is not necessary to keep the instructions in **Table 1** strictly in the practical use.

APPEARANCE



SPECIFICATIONS

| | | |
|-------------------------|---|--|
| Video input | : | 0.12 - 2 Vpp (TP3) |
| Input impedance | : | 45 Ω - 175 Ω (TP1) |
| Video output | : | 1 Vpp, 75 Ω |
| Freq. response | : | 50 Hz - 5 MHz (-3 dB) |
| Disturbance reduction | : | > 70 dB, 50 Hz (TP2) |
| Gain adjustment | : | +6 dB...+60 dB at 5 MHz (SW1-SW16, TC, TP) |
| Noise | : | -50 dB at +40 dB gain adj. -47 dB at +60 dB gain adj. |
| Power supply | : | 24 V, AC/DC, 100 mA max. |
| Input protection | : | noble-gas filled surge arrester, zener diodes |
| Power supply protection | : | varistor |
| Indicators | : | LED2 (green) - power-on LED1 (red) - video-signal-error |
| Casing | : | ABS |
| Dimensions | : | 160(W) x 55.5(H) x 100(D) mm |
| Protection | : | IP - 65 (VDE) |

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