MONITORS MTC 9110
25”” 28””

• MANUALE DI SERVIZIO
• SERVICE MANUAL
• HANDBUCH
• MANUAL DE SERVICIO
• MODE D’EMPLOI
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DETAILS AND INOVATIONS OF THE MTC 9110 - 25''-28''

1) The MTC 9110 monitor has been designed for maximum versatility, so allowing it to be used with almost any logic board.

2) The 'monolithic' construction, using a single printed circuit board, makes maximum use of the automatic insertion of components, which, being free of human error, guarantees a high level of production uniformity coupled with a high level of reliability.

3) Completely new mechanical design with the specific object of making the unit extremely resistant to impact and vibration during transportation.

4) Use of two connectors (CL and CM on the printed circuit board) for the deflexion unit with cross-over wiring which permits easy inversion and reversal of the image — often an indispensable feature.

5) The electronics for the 25''-28''/110° incorporates a thermostat mounted on the heat sink (on the side of TR BU 508) which guarantees an exceptionally high degree of product safety and reliability. The thermostat comes into operation if its temperature reaches 75-80°, interrupting the 130 V d.c. supply so bringing the fault to the attention of the operator. This could happen if, for example, the ventilator failed, or the monitor were used in conditions of extreme ambient temperature.

6) All the controls which affect the display (horizontal and vertical frequency, horizontal and vertical amplitude, horizontal phase and vertical shift) are mounted on a small separate p.c.b. which is normally plugged into a connector on the main board, but may be used in conjunction with a 1.5 metre long extension cable that is available on request. This allows the control card to be mounted in a specially moulded mounting bracket in a position where the operator can easily adjust the monitor while directly viewing the image.

7) The video input is fed via a precision three-gang potentiometer permitting acceptance of input signals in the range 1 to 5 V p.p. without creating changes in colour balance.

8) Utilization of a new integrated circuit for vertical deflexion (TDA 1670A) resulting in the short vertical fly-back time of 0.7 ms, so extending the range of logic board usage.

9) Incorporation of a new integrated circuit in the horizontal sync. circuitry. This I.C. guarantees a positive protection against x-ray radiation and conforms with the principal international public health regulations, such as F.D.A. Federal Drug Administration.
WARNING

1) SUPPLY
   The input supply of the monitor (128 V a.c.) must be fed via a mains isolating transformer.

2) EARTHING
   The chassis and the heat sinks are connected to earth. To measure voltages and to inspect waveforms,
   connect the negative terminals of instruments to the chassis.

3) X-RAYS
   The monitor has been designed to minimize x-ray radiation. Furthermore, a special safety circuit comes
   into operation in the event of failure to limit radiation to below 0.5 mR/h.

4) E.H.T.
   Dangerously high voltages are present inside the monitor, and for safe operation it is imperative to
   follow all safety instructions and warnings.

5) C.R.T.
   The cathode-ray tube is a high vacuum device and its surfaces are subject to high external pressure.
   It is therefore necessary to handle the tube with care and to avoid impact which could cause implosion.
   It follows that personnel handling cathode-ray tubes during installation or during replacement, should
   wear thick gloves and protective clothing to protect against possible flying glass splinters.

6) WEATHER PROTECTION
   To avoid the possibility of electric discharge, do not expose the monitor to rain or excessive humidity.

PROTECTION AGAINST X-RAY RADIATION

(D.H.H.S. accession n. 8720899-05)
The MTC 9110 monitor contains an x-ray protection circuit. A reference voltage is generated from the
E.H.T. transformer and is fed via a resistive divider to pin 8 of I.C. TDA 2595.
The voltage appearing at pin 8 is compared with an accurate reference voltage within the I.C., and if
the E.H.T. exceeds 30 kV the voltage at pin 8 operates a trigger circuit which inhibits the oscillator and
hence the generation of the E.H.T.
The circuit continues to block the oscillator until the cause of the failure has been repaired, and can
only be reset by completely switching-off the monitor and switching-on again.
TECHNICAL CHARACTERISTICS

1) SUPPLY
128 V a.c. + 10 — 10%, 50/60 Hz
The supply to the monitor must be via an isolating transformer with the following characteristics:
primary 120 V a.c. (USA) 220/240 V a.c., secondary 128 V a.c. 150 W.

2) POWER CONSUMPTION
100 W max.

3) DEGAUSSING
100 ± 264 V a.c. automatic.
To change to manually controlled degaussing, remove bridge P34 and insert a twin cable of the desired
length into connector CD terminated in a push-button switch, enabling degaussing to be effected
at any time.

4) VIDEO INPUT SIGNALS
RGB positive-going with an input impedance of 2.2 kOhm. Input sensitivity from 1 to 5 V p.p. Input
connexion as shown on page 37.
For negative-going input signals refer to the description of the «Video Invertor» on page 39.

5) VIDEO PASS BAND
-3 dB at 12 MHz

6) HORIZONTAL BLANKING
12 us

7) VERTICAL BLANKING
1 ms

8) SYNC. SIGNALS
Horizontal and vertical, positive or negative, composite or separate. Input impedance 2.2 kOhm. Input
level between 1.5 and 5 V p.p. Input connexion as shown on page 37.
Selection of positive or negative input is made by switch SW4 (see page 37).

9) SCANNING FREQUENCIES
Horizontal 15.625 ± 0.5 kHz: adjustable.
Vertical 45-65 Hz: adjustable.

10) CONTROLS
Contrast, brightness, focus, horizontal frequency, horizontal phase, horizontal amplitude, horizontal
linearity, vertical frequency, vertical shift and vertical amplitude. For further details see page 37.
INSTALLATION AND SETTING-UP INSTRUCTIONS

1) SUPPLY
Check that the h.t. line voltage of the monitor at test point TP10 is 130 V d.c. ± 3%.

2) HORIZONTAL OSCILLATOR
Remove the incoming sync. signal (for which one may use SW4) and turn RV5 to obtain a stationary image. Reconnect the sync. input signal.

3) VERTICAL OSCILLATOR
Adjust RV1 to obtain a slow roll-over of the image in a downward direction. Turn back until the image locks.

4) FEED VOLTAGE TO VERTICAL DEFLEXION CIRCUIT
Check that the voltage at TP13 is 26 V d.c. ± 5%. See page 35.

5) FEED VOLTAGE TO VIDEO AMPLIFIER
Check that the voltage at TP1 is 24 V d.c. ± 5%. See page 35.

6) FEED VOLTAGE TO VIDEO OUTPUT AMPLIFIER
Check that the voltage at TP14 is 200 V d.c. ± 5%. See page 35.

7) ADJUSTMENT OF BRIDGE COIL
Bridge Coil B3 is adjusted on the production line, but should it become necessary to re-adjust, the following procedure should be adopted:
a) Adjust RV4 on board CG for minimum horizontal amplitude.
b) Adjust the ferrite core of B3 for minimum horizontal amplitude.
c) Re-adjust RV4 to obtain the desired amplitude.

8) ADJUSTMENT OF EAST/WEST CIRCUIT
Adjust pre-set resistor RV401 on module KK (see page 37) to obtain the best vertical geometry.

9) ADJUSTMENT OF GAIN OF RGB VIDEO OUTPUT STAGES
Having inserted RGB signals of equal amplitude to the inputs, turn the blue gain control RV206, located on the c.r.t. neck board ZG, to its mid-position and adjust the Contrast Control P1 so that the video signal measured with an oscilloscope at the blue cathode is 100 V p.p. Adjust the signals at the cathodes of the red and green guns to the same value by adjustment of RV202 and RV201. See page 37.

10) ADJUSTMENT OF «WHITE»
a) Remove the video input signal.
b) Turn RV7 on the c.r.t. grid 1, to maximum brightness.
c) Turn the black level controls situated on the c.r.t. neck board, RV203 red, RV204 green and RV205 blue, to minimum (clockwise).
d) Reduce the brightness by adjusting the voltage on grid 2 by means of the control situated on the line output transformer TH2 so that the dominant colour is only just visible, and then adjust the black level controls to obtain the best white possible.
e) The G2 «Screen» potentiometer functions as the brightness control.

11) FOCUS
Adjust the focus control (FOCUS situated on the line output transformer TH2) using a dot pattern signal, with medium brightness, to give the best focus obtainable.

12) HORIZONTAL LINEARITY
Using a grid pattern signal, adjust for the last square on the right to be equal in size to the first square on the left.
OPERATING INSTRUCTIONS

1) Insert the supply cable to the power input connector CC. See page 37.
2) Insert the signal and sync. cable to the input connector CA. See page 37.
3) Set sync. selector switch SW4 to positive or negative according to the type of input signal. as to
   obtain a locked image horizontally and vertically. See page 37.
4) Next adjust vertical amplitude, vertical frequency, horizontal amplitude, horizontal phase, vertical shift,
   horizontal frequency, East-West, brightness and contrast to match the applied signal. See page 37.
Finally it may be necessary to trim to the colour and white adjustments. See para. 9 and 10 page 10.

MONITOR POWER INPUT CONNEXION SCHEMATIC (U.S.A. ONLY)

REMOTE CONTROL

The following controls are all mounted on a small printed circuit board CG: vertical frequency, vertical
amplitude, vertical shift, horizontal frequency, horizontal phase, horizontal amplitude. The board is fitted
with a socket connector which is plugged into a mating plug connector CF on the main board, and may
be removed and re-connected via a 1.5 metre cable (available on request) enabling the operator to adjust
all those controls from the front of the monitor.
The cable and the special plastic support frame for remotely mounting the control board can be ordered
by quoting part no. 62008440 Remote Control Assembly.
### Ventilator Assembly ALI 1338 UTS 75

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### Packing Assembly 25" 110"

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### East-West P.C.B. Assembly 25" 28"

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<td>25262209</td>
<td>FILM CAPACITOR 1.85 122NF 150V 10%</td>
<td>C 401-402</td>
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### Legend

- FILM CAPACITOR
- FILM CAPACITOR 1 60
- FILM CAPACITOR 1 76
- FILM CAPACITOR 1 73
- FILM CAPACITOR 1.85
- FILM CAPACITOR 22 205
- RADIAL ELECT. CAPACITOR
- CAPACITOR, POLYSTYRENE
- CAPACITOR, METALLIZED POLYESTER
- CAPACITOR, DOUBLE METALLIZED POLYPROPYLENE
- CAPACITOR, METALLIZED POLYPROPYLENE
- CAPACITOR, METALLIZED POLYESTER
- CAPACITOR, POLYSTYRENE
• T.P. DI CONTROLLO E FORME D’ONDA
• CONTROL TEST POINTS AND WAVEFORMS
• TEST-PUNKTE UND OSZILLATORDIAGRAMME
• PUNTO DE PRUEBA PARA CONTROL Y FORMA DE ONDA
• POINTS DE TEST DE CONTROLE ET FORME D’ONDE

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**FORME D’ONDA**

**WAVEFORMS**

**T.P. 2**
Sincronismo verticale
*Vertical sync.*

**T.P. 3**
Pilotaggio deflessione verticale
*Vertical drive*

**T.P. 4**
Segnale di reazione deflessione verticale
*Vertical feedback*

**T.P. 5**
Sincronismo composito
*Composite sync.*

**T.P. 8**
Pilotaggio per transistor finale di riga
*Horizontal drive*

**T.P. 9**
Correzione est/ovest con modulo KK inserito
East/west correction with module KK inserted

**T.P. 11**
Spegnimento orizzontale e verticale
*Horizontal and vertical blanking*

**1.**
Impulso del collettore BU 508
*Pulse at collector of BU 508*

**2.**
Segnale sui catodi finale video RVB
*Signal at cathodes of RGB video output*

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**TENSIONI**

**SUPPLIES**

**T.P. 1**
24/25 V.d.c. Alimentazione amplificatore video
24/25 V.d.c. Video amplifier supply

**T.P. 10**
130 V.d.c. ± 2% Alimentazione stabilizzata
130 V.d.c. ± 2% Stabilized supply

**T.P. 12**
12 V.d.c. Alimentazione sincronismo e oscillatori orizzontale (TDA 2595)
12 V.d.c. Horizontal sync. and oscillator supply (TDA 2595)

**T.P. 13**
25/26 V.d.c. Alimentazione verticale
25/26 V.d.c. Vertical supply

**T.P. 14**
200/210 V.d.c. Alimentazione finale video
200/210 V.d.c. Video output supply
INVERTER VIDEO

Per permettere l’adattamento di logiche con segnale video negato al monitor MTC9110, l’HANTAREX ha studiato una scheda d’interfaccia applicabile direttamente sulla centina metallica dell’elettronica. La scheda è fornita delle istruzioni di montaggio, delle connessioni elettriche e dello schema. Per la richiesta fare riferimento al cod. 63000160 scheda -INVERTER-VIDEO-.

To enable the MTC 9110 to be used with negative going input signals, HANTAREX has designed an interface board which mounts directly into the framework of the monitor. The board is supplied complete with circuit diagram, mounting instructions and connexions to the monitor. To order, quote part no. 63000160 Inverter Video.
ACCESSORI  ACCESSOIRES  ZUBEHÖR  ACCESORIOS  ACCESSORIES

• Trasformatore di alimentazione monitor MTC9110 220/240 Vac / 128 Vac 150 W. (Per richiesta cod. 28070460).
• Isolating transformer for supplying monitor MTC9110 220/240 V a.c. / 128 V a.c. 150 W. To order, quote: cod. 28070460.
• Trenntransformator für die Stromversorgung des Monitors MTC9110 mit 220/240 V Eingang, 128 V / 150 W Ausgang. Bestell-Nr. 28070460.
• Transformador de alimentación monitor MTC9110 220/240 Vac / 128 Vac 150 W. (Para solicitud cod. 28070460).
• Transformateur d’alimentation pour moniteur MTC9110 220/240 V c.a. / 128 V c.a. 150 W. (Code 28070460).

• Trasformatore di alimentazione monitor MTC9110 120/128 Vac 150 W. (Per richiesta cod. 28070440).
• Isolating transformer for supplying monitor MTC9110 120/128 V a.c. / 150 W. To order, quote: cod. 28070440.
• Trenntransformator für die Stromversorgung des Monitors MTC9110 mit 120/128 V Eingang, 128 V / 150 W Ausgang. Bestell-Nr. 28070440.
• Transformador de alimentación monitor MTC9110 120/128 Vac 150 W. (Para solicitud cod. 28070440).
• Transformateur d’alimentation pour moniteur MTC9110 120/128 V c.a. 150 W. (Code 28070440).

• Cablaggio ingresso alimentazione. Viene fornito unitamente al monitor. (Per ricambistica cod. 61000120).
• Input Power Lead. Supplied with each monitor. Spare part no. cod. 61000120.
• Verbindungskabel für Stromversorgung mit Anschlußstecker für Monitor MTC9110. Bestell-Nr. 61000120.
• Cable de entrada de alimentación. Viene incluido con el monitor. (Para recambio cod. 61000120).
• Câblage d’entrée d’alimentation. Il est fourni avec le moniteur. (Pour pièces de rechange code 61000120).

• Cablaggio ingresso segnali. Viene fornito unitamente al monitor. (Per ricambistica cod. 61000140).
• Input Signal Lead. Supplied with each monitor. Spare part no. cod. 61000140.
• Verbindungskabel RGB - Signal mit Anschlußstecker für Monitor MTC9110. Bestell-Nr. 61000140.
• Cable de entrada de señales. Viene incluido con el monitor. (Para recambio cod. 61000140).
• Câblage d’entrée des signaux. Il est fourni avec le moniteur. (Pour pièces de rechange code 61000140).

• Supporto metallico per MTC9110 per fissare l’elettronica al mobile nel caso debba essere disassemblata dal cinescopio. (Per richiesta cod. 50113370).
• Metal support for fixing electronic chassis to a case when the chassis is to be separated from the c.r.t. To order, quote cod. 50113370.
• Metallrahmen für MTC9110 zur Aufnahme von Chassis und der Bildröhre. Bestell-Nr. 50113370.
• Soporte metalico para el MTC9110 para fijar el circuito impreso al mueble, en el caso en que deba ser descollado del TRC. (Para solicitud cod. 50113370).
• Support métallique pour MTC9110 pour fixer l’électronique sur le meuble dans cas où elle devrait être desassemblée du tube image. (Code 50113370).
Monitor MTC9000 10" COD. 02191552
Video R.V.B. positivo analogico, sincronismi compositi, separati, negati o positivi.
Alimentazione: 128 Vac - 70 W.
Dimensioni: L × H × P mm 297 × 250 × 307.

Monitor MTC9000 10" COD. 02191552
Video RGB, positive analogue, composite or separate sync., negative or positive.
Power: 128 V a.c., 70 W.
Dimensions: L × W × D: 297 × 250 × 307 mm.

Monitor MTC9000 14" 90° COD. 02191535
Video R.V.B. positivo analogico, sincronismi compositi, separati negati o positivi.
Alimentazione 128 Vac - 100 W.
Dimensioni: L × H × P mm 372 × 312 × 352.

Monitor MTC9000 14" 90° COD. 02191535
Video RGB, positive analogue, composite or separate sync., negative or positive.
Power 128 Va.c., 100 W.
Dimensions: L × W × D: 372 × 312 × 352 mm.

Monitor MTC9000 15" F.S. COD. 02191870
Video R.V.B. positivo analogico, sincronismi compositi, separati, negati o positivi.
Alimentazione: 128 Vac - 100 W.
Cinescopio: Flat Full Square MR.
Spazio fra le triadi 0,51 mm.
Dimensioni: L × H × P mm 400 × 330 × 360.

Monitor MTC9000 15" F.S. COD. 02191870
Video RGB, positive analogue, composite or separate sync., negative or positive.
Power: 128 V a.c., 100 W.
C.r.t. flat full square MR. Pixel spacing 0.51 mm.
Dimensions: L × W × D: 400 × 330 × 360 mm.

Monitor MTC9000 16" 90° COD. 02191522
Video R.V.B. positivo analogico, sincronismi compositi, separati negati o positivi.
Alimentazione 128 Vac - 100 W.
Dimensioni: L × H × P mm 424 × 340 × 380.

Monitor MTC9000 16" 90° COD. 02191522
Video RGB, positive analogue, composite or separate sync., negative or positive.
Power 128 Va.c., 100 W.
Dimensions: L × W × D: 424 × 340 × 380 mm.
Monitor MTC9000 20” 90° COD. 02191278
Video R.V.B. positivo analogico, sincronismi composti, separati, negati o positivi.
Alimentazione: 128 Vac - 100 W.
Dimensioni: L x H x P mm 512 x 406 x 442.

Monitor MTC9000 20” 90° COD. 02191278
Video RGB, positive analogue, composite or separate sync., negative or positive.
Power: 128 V a.c., 100 W.
Dimensions: L x W x D: 512 x 406 x 442 mm.

Alimentatore a commutazione US 250 COD. 63000131
Basse tensioni: 5 Vdc 10A / 12 Vdc 2A / —5 Vdc 1A / —12 Vdc 1A.
Dimensioni: L x H x P mm 288 x 156 x 124.

Switched Mode Power Supply US 250 COD. 63000131
Low tensions: 5 V d.c. 10A. 12 V d.c. 2A.
—5 V d.c. 1A. —12 V d.c. 1A.
Dimensions: L x W x D: 288 x 156 x 124 mm.

Alimentatore a commutazione US 300 Ventilato
COD. 63000081
Basse tensioni: 5 Vdc 15A / 12 Vdc 2A / —5 Vdc 1A / —12 Vdc 1A.
Dimensioni: L x H x P mm 288 x 188 x 124.

Switched Mode Power Supply US 300 ventilated
COD. 63000081
Mains input: 187 ÷ 264 V a.c. supply without mains transformer. Low tensions: 5 V d.c. 15A. 12 V d.c. 2A.
—5 V d.c. 1A. —12 V d.c. 1A.
Dimensions: L x W x D: 288 x 188 x 124 mm.

Generatore di segnali R.V.B. e sincronismi MOD. K 190 G
COD. 02190280
Utile per la messa a punto di monitors aventi un ingresso segnali R.V.B.
Commutatori frontalì per la selezione delle varie immagini.

RGB Signal Generator with sync. MOD. K 190 G
COD. 02190280
Invaluabale for setting-up colour monitors with RGB input. Front panel switching for selecting a variety of images.