I.DEN®
CORPORATION

INSTRUCTION MANUAL

IVT-7

NTSC

DIGITAL TIME BASE CORRECTOR

I.DEN CORPORATION

NO. TB-

Technical Bulletin

for model: IVT-7

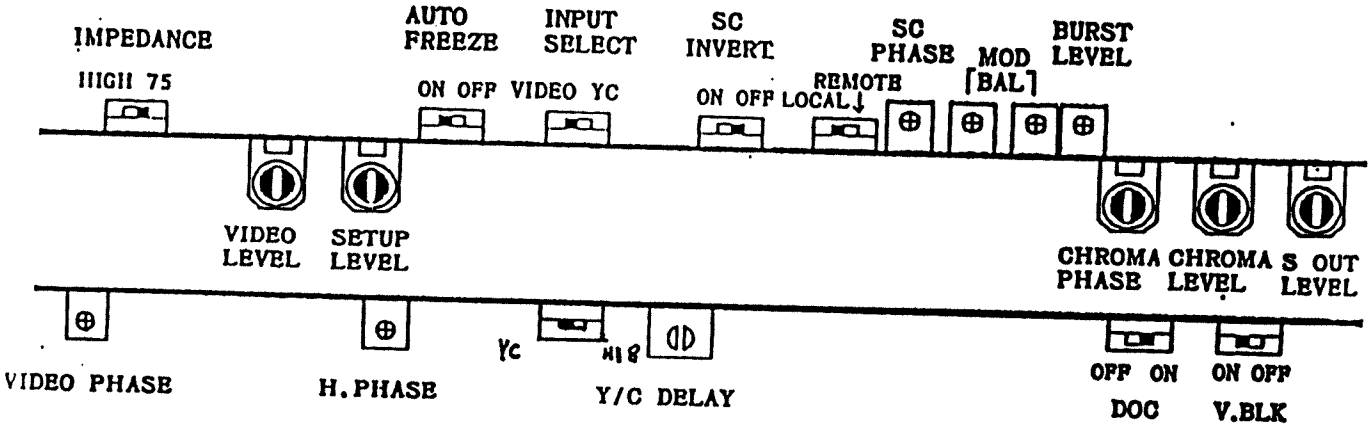
DATE: 9/20/90

SUBJECT: HI-8 Modification in units serial numbers 10050400 and higher.

This unit has been modified to accept HI-8 and be adjustable in Y/C delay. When using in HI-8 format, make sure input select switch is in YC and that the HI-8 switch is in HI-8 position.

○ Page16 3-2 FRONT OF PRINTED CIRCUIT BOARD

The front panel of IVT-7 will be altered accordingly as below:



CHANGES in IVT-7 INSTRUCTION MANUAL

○ Page11 2-3-1 VIDEO IN

additional information:

Products after serial No.10050201 have a 5.5MHz frequency bandwidth apart from the sub-carrier filter. If there is a large variation of the color signal at the output video signal of the IVT-7,adjust the characteristics of the sub-carrier filter.

○ Page12 2-3-2 YC358 IN

additional information:

A Y signal input impedance selection switch is installed at the front of the PCB in products after serial No.10050101. Make sure this switch is set to 75 ohm.

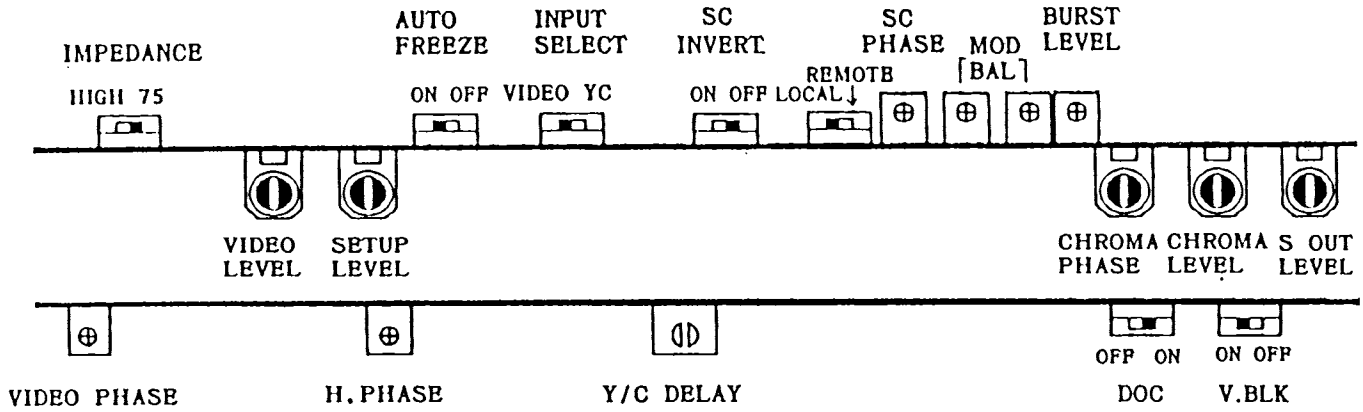
○ Page13 2-3-3 DUB IN

additional information:

A Y signal input impedance selection switch is installed at the front of the PCB in products after serial No.10050101. Set it so that it matches the DUB Y output impedance of the VTR.

○ Page16 3-2 FRONT OF PRINTED CIRCUIT BOARD

The front panel of IVI-7 will be altered accordingly as below:



additional information:

● I M P E D A N C E S E L E C T HIGH/75ohm (after S/No.10050101)
This switch is for switching the Y input impedance between YC input or DUB input.

● B U R S T L E V E L
This adjusts the burst level of VIDEO OUT and S OUT.

○ Page18

Current entry in IVI-7 Hanual reads:

● C H R O M A L E V E L
V I D E O O U T (Standard position ⓘ)

However customers should note the Hanual now reads:

● C H R O M A L E V E L (standard position ⓘ)

(CHROMA LEVEL refers to the chroma level of the Video Output and YC Output.)

Current entry in IVT-7 Manual reads:

YC OUT(standard position ⓘ)

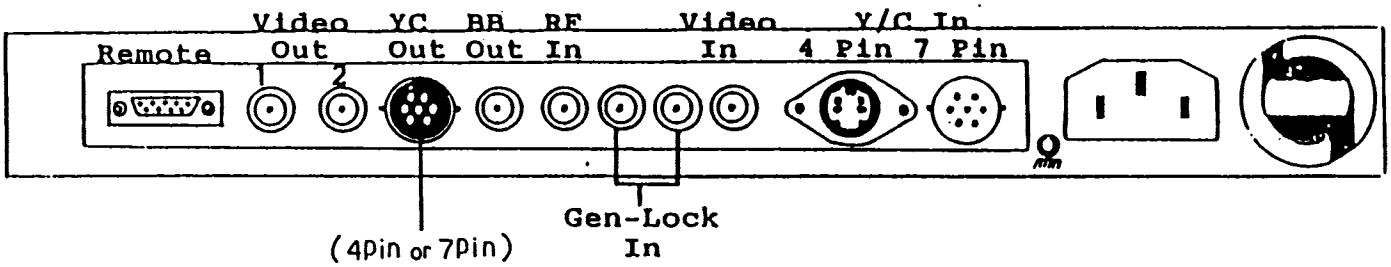
However customers should note the Manual now reads:

●S OUT LEVEL(standard position ⓘ)

(S OUT LEVEL refers to YC358(S-VHS) output level)

○ Page20 3-3 REAR PANEL

The rear panel of IVT-7 will be altered accordingly as below:



○ Page25 (1) Noise reduction

additional information:

Products after serial No.10050201 have high VIDEO INPUT bandwidth characteristics. Because YC separation is carried out in the SC TRAP, the chroma signal is insufficiently removed from the Y signal. So, by using a circuit to reduce noise in this Y signal, chroma components are completely removed from the Y signal. Therefore, VR10 sets the voltage at TP14 to +0.12～+0.14V with respect to the voltage at TP17.

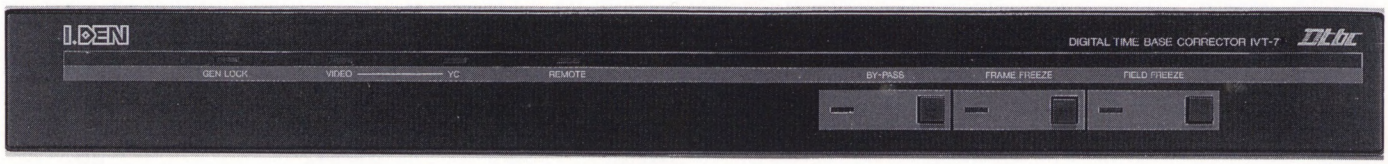
○ Page27 SPECIFICATIONS

Current entry in IVT-7 Manual reads:

Freq.response Composite :3.0Mhz -3dB

However customers should note the following improvement in specification:

Freq.response Composite :5.5MHz -3dB(Except SC TRAP)



DIGITAL TIME BASE CORRECTOR

IVT-7

NTSC

IVT-7 INSTRUCTION MANUAL

Table of Contents

1-1 GENERAL DESCRIPTION

The IVT 7 is a small but multifunctional digital time base corrector. Because it incorporates a frame memory, it can be used to synchronize with reference signals the recorded signals of a VTR which has no input terminal for external synchronizing signals. Therefore, a VHS VTR or the like can be used for a system using a video mixer or switcher.

Acceptable input signals are composite video signals as well as YC358 and DUB signals. Both U-MATIC DUB and VHS DUB signals are acceptable. For connection, see Section 2-3. Inputting YC358 or DUB signals provides a high resolution of 5.5 MHz results.

The functions of this equipment are summed up under Section 1-3. If there is any point you want to have clarified, please contact us.

1-2 SPECIFICATIONS

(1) Video input signals

Composite video	Y:1.0Vpp	75 ohm
YC358 (4PIN or 7PIN)	Y:1.0Vpp	75 ohm
	C:0.286Vpp	75 ohm (burst level)
U-DUB	Y:1.0Vpp	75 ohm

	C: Composite video	
VHS DUB	Y:1.0Vpp	75 ohm
	C: Composite video	
(2) GEN-LOCK input signal	BB: 0.45Vpp	75 ohm or through out
or Composite video:	1.0Vpp	75 ohm or through out
(3) RF signal	0.2-2.0Vpp	75 ohm
(4)Video output signal		
Composite video-1	1.0Vpp	75 ohm
Composite video-2	1.0Vpp	75 ohm
YC358	Y: 1.0Vpp	75 ohm
	C: 0.286Vpp	75 ohm
(5) Black burst output signal	0.45Vpp	75 ohm
(6) Internal processing	Component	
(7) Sampling frequency	Y: 13.5 MHz	
	C: 6.75 MHz	
(8) Quantization	Y: 8 bits	
	C: 8 bits	
(9) Frequency characteristics	Y: 5.5 MHz -3 dB	
(10) DG,DP	2%, 2	
(11) Waveform characteristic	1%	
	(In case of Video-in, 3%)	
(12) S/N	58 dB	

1-3 FUNCTION

The principal functions and features of this equipment are as follows]:

(1) Freeze function

In addition to frame freeze and field freeze from the front panel, there is an auto-freeze function which freezes and outputs the image immediately preceding the stoppage of input signals. This auto-freeze function can be turned on/off at the front of the printed circuit board.

(2) ACC function

This is to detect the burst level of input signals and automatically controls the chroma level.

(3) Chrominance signal line shift function

Chrominance signal line shifts which may occur in a VHS VTR or the like can be corrected. This correction can be made within the range of -1H, OH-, +1H, +2H by moving the jumper pin of J1 on the digital circuit board. For how to take out the digital circuit board, see Section 4.

(4) GEN-LOCK function

The output signal of this equipment can be phase-synchronized with the GEN-LOCK input signal by connecting the GEN-LOCK input connector on the rear

panel with a black burst signal which makes a reference or a stable composite video signal (e.g., color bar signal).

(5) DOC function

When the RF signal (for DOC) of a VTR is connected to the RF IN connector on the rear panel, and when the DOC ON/OFF switch on the front panel is set to ON, dropout compensation can be made line by line.

(6) V, blanking can be turned on/off.

VITC and other input signals during the vertical blanking period can be passed by turning off the V. Blanking switch at the front of the printed circuit board.

(7) Noise reduction function

The chroma signal noise reduction function is always at work, bringing about an improvement of about -3 dB.

When the Y-signal noise reduction function is brought into play, vertical resolution deteriorates. Therefore, a function which detects vertical correlation is provided so as to prevent the deterioration of vertical resolution.

The variable resistor VR10 within the digital circuit board (underside performs the function of adjusting vertical correlation detection sensitivity.

When set at the extreme counterclockwise, the Y-signal noise reduction function does not work at all.

When turned clockwise gradually, the function goes into operation. When set at the extreme clockwise, Y-signal noise reduction operates perfectly, but vertical resolution deteriorates.

1-4 STANDARD CONFIGURATION

The IVT-7 is composed of two main circuit boards and a power supply.

On the front panel of the chassis is a printed circuit board mounted with a switch and an LED and is connected with the main circuit boards by cables.

The rear panel forms one body with the shield board on which the main boards are mounted.

When the front panel board and the main board are to be removed, be sure to cut off the power supply. A simple configuration drawing is shown in Section 4.

1-5 ACCESSORIES

Standard accessories	Power cable	1
	Spare fuse	1
	Rack mount adapter	2

	Rubber legs	4

Optionals

TR-7	Remote control unit. The functions of TR-7 are field freeze, frame freeze and bypass control.
CA3-2	Cable for YC358 input (for 7-pin input) YC358 input connectors provided are 4-pin and 7-pin connectors. Connect with either.
CA4-2	Cable for YC358 output. A 7/4-pin cable for connections the YC358 output signal of this equipment with an S-VHS or ED-BETA VTR equipped with a 4-pin input connector.
CA2-2P	7/7-pin cable. This cable is to connect this equipment provided with a 7-pin YC358 input or output connector.
CA2-2	U-DUB input cable. This connector is provided with a 7-pin connector at one end and 7-pin and BNC connectors at the other end. Connect one of the 7-pin connectors

with the YC input connector of the IVT-7. Connect the other 7-pin connector with DUB OUT and the BNC connector with VIDEO OUT.

DUB output signals sent out by YC separation can be connected with a 3/4" VTR (U-MATIC) or VHS VTR.

2-1 UNPACKING AND INSPECTION

The IVT-7 is shipped in adequately packed form. If the product is found to be damaged when unpacked, contact the express company or supplier without delay. The product is packed in such a manner that it can be transported easily. When the product is to be moved or transported, use the packing material used for delivery and take care not to apply abrupt shocks.

At the time of unpacking, make sure of the accessories (1-5).

2-2 INSTALLATION

The IVT-7 not only permits desk-top use, but it also can be mounted on the 19-inch standard rack with the aid of the standard accessory adapter.

If the IVT-7 is to be used in the best condition, it should be kept permeable inside. For internal ventilation, the air for cooling is sucked in from both sides and blown out by the rear fan. Therefore, the inlet and outlet ports should be kept apart from the wall and the floor to ensure sufficient ventilation.

When used on the desk top, it should have the

standard accessory rubber legs at four points.

Do not place on the equipment any heavy object exceeding 20 kg.

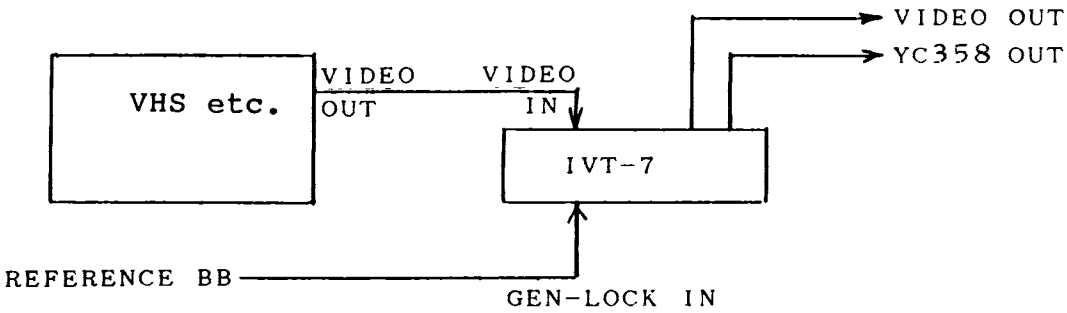
If anything is placed on the equipment, a board of wood or the like should be placed between the equipment and the object.

2-3 SYSTEM CONFIGURATION

Here is an example of IVT-7 connection.

In case of no GEN-LOCK IN connection, the IVT-7 operates with the aid of the internal synchronizing signal generator. When a GENLOCK signal is connected, the output signal of the IVT-7 is synchronized with it.

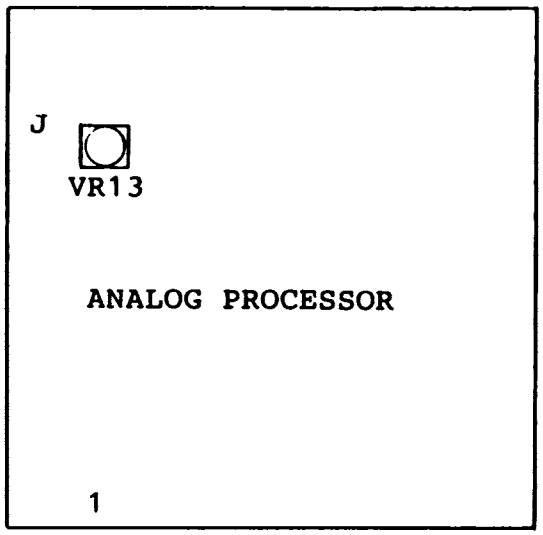
▼2-3-1 VIDEO IN



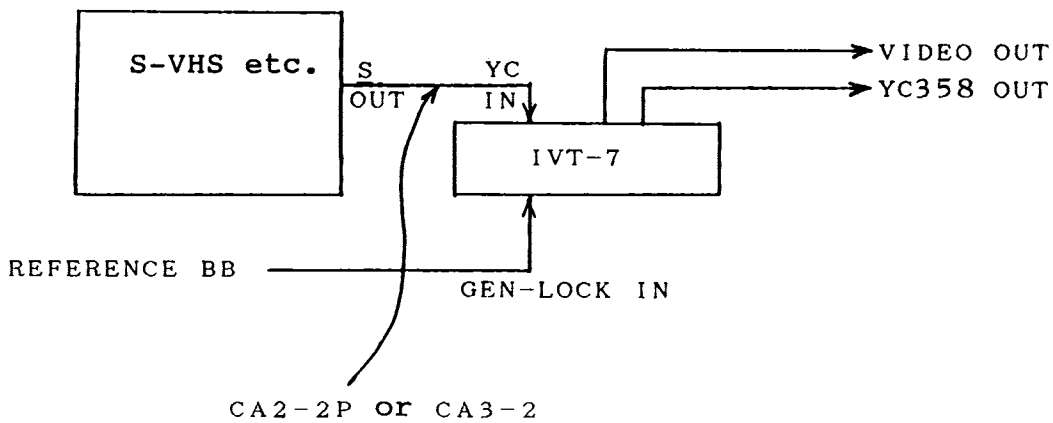
Open the front panel and set the input selection switch at VIDEO. LED display "VIDEO" on the front panel will light up.

Two kinds of output signals are outputted at the same time, but in the bypass mode or when the power supply is off, VIDEO-IN signals are outputted directly at VIDEO OUT-1.

The frequency characteristic of the VIDEO-IN mode turn VR13 on the analog circuit board clockwise. Then a characteristic exceeding 3.0 MHz, -3 dB will be obtained.



▼2-3-2 YC358 IN

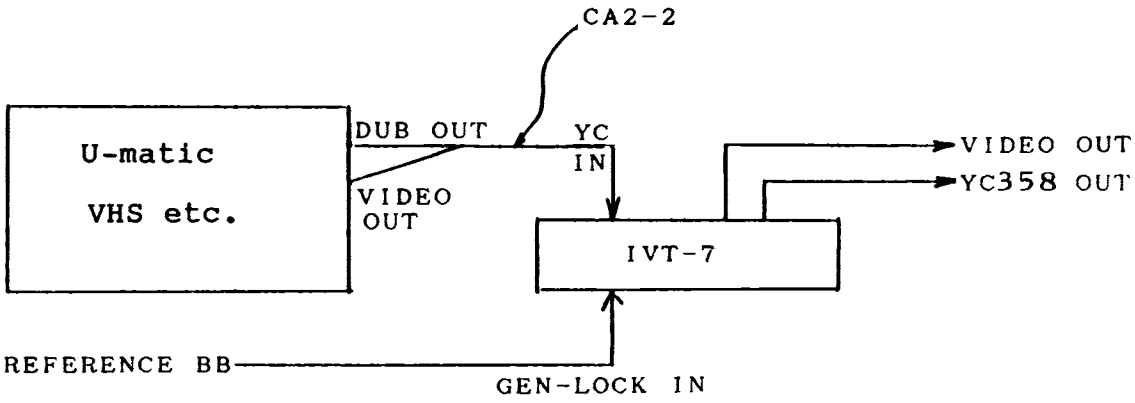


Open the front panel and set the input selection switch to "YC". LED "YC" on the front panel will light up.

Two kinds of output signals are outputted at the same time, but in the bypass mode or when the power supply is off, YC input signals are outputted directly

at YC OUT.

▼2-3-3 DUB IN

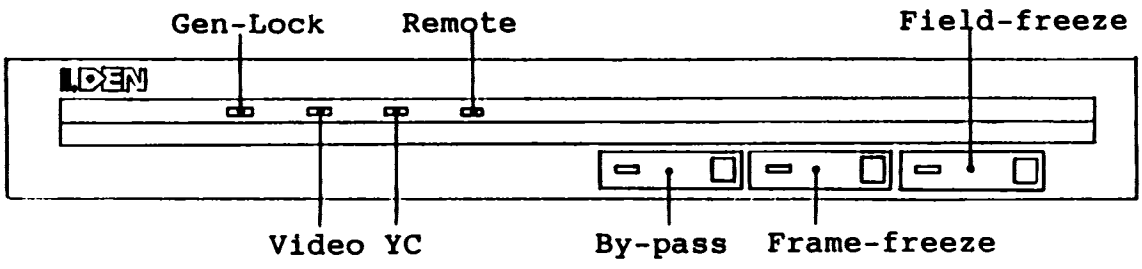


The IVT-7 permits input of DUB OUT signals from a U-MATIC VTR or VHS VTR. For the input cable connect the optional CA2-2 as shown in the chart.
Open the front panel and set the input selection switch at "YC". LED "YC" on the front panel will light up.

In the bypass mode or when the power supply is off, the Y signal of a VTR's DUB OUT is outputted directly as a Y signal at YC OUT while the VIDEO OUT signal from the VTR is outputted directly as a C signal at YC OUT.

When inputting a DUB signal, make sure of the DUB (Y) output level and impedance of the VTR.

3-1 FRONT PANEL



Open the front panel and turn on the power switch, and one of the LEDs on the front panel will light up:

"GEN-LOCK"

This lights up when the reference signal is connected to GEN-LOCK IN on the rear panel. The output signal will synchronize with the reference signal.

When the reference signal is not supplied, the GEN-LOCK LED does not light up. In this case, the IVT-7 operates with the aid of the internal synchronizing signal generator.

"VIDEO"

Opening the front panel and setting the input selection switch at "VIDEO" light up this lamp and put the equipment in the VIDEO input mode.

"YC"

Opening the front panel and setting the input selection switch at "YC" will light up this lamp. The signal connected with YC IN on the rear panel becomes an input signal for this equipment.

"REMOTE"

Opening the front panel and setting the REMOTE/LOCAL switch at "REMOTE" will light up this lamp. The BYPASS, FRAME FREEZE and FIELD FREEZE functions cannot be controlled from the front panel. They are controlled by a signal from the REMOTE connector on the rear panel.

"BYPASS" switch and LED

While the LED is turned on after the press of the switch, the IVT-7 is in the bypass state. This LED remains lit under remote control when the IVT-7 is in the bypass state.

"FRAME" freeze switch and LED

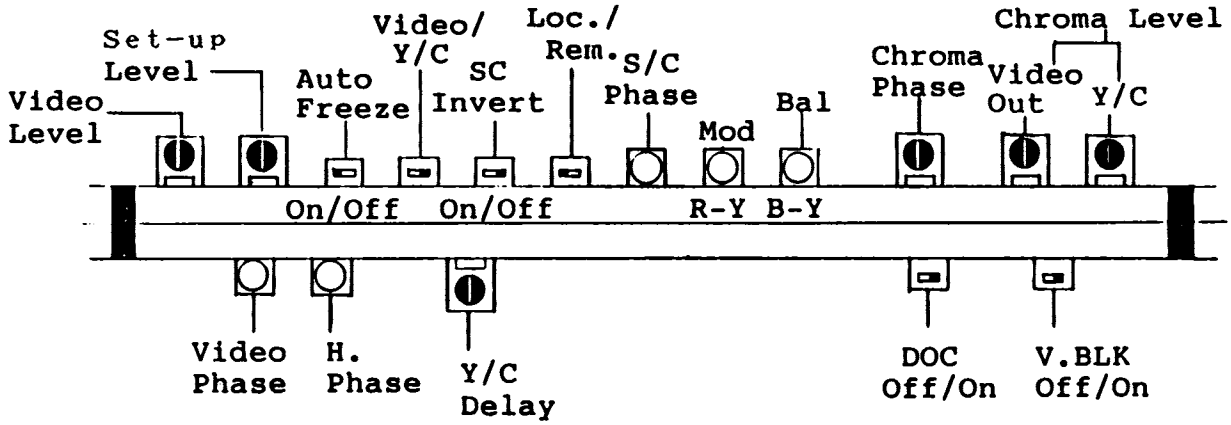
When this switch is pressed while the IVT-7 is in operation, the LED lights up, indicating the frame

freeze state. When the switch is pressed again, the LED goes out, releasing the frame freeze.

"FIELD" freeze switch and LED

When this switch is pressed while the IVT-7 is in operation, the LED lights up, indicating the field freeze state. When the switch is pressed again, the LED goes out, releasing the field freeze state.

3-2 FRONT OF PRINTED CIRCUIT BOARDS



•VIDEO LEVEL (Standard position ⓘ)

This is to control the luminance signal level of input signals.

•SET-UP LEVEL (Standard position ⓘ)

This is to correct the Set-up level of input signals.

•AUTO FREEZE ON/OFF

ON: When input signals are cut off, the immediately preceding signal is outputted in the freeze state. Under certain cutoff conditions a black strip signal might appear in the freeze picture.

OFF: When input signals are cut off, the output signal turns black.

•VIDEO/YC (Input selection switch)

VIDEO: The signal connected with VIDEO IN on the rear panel is made into an input signal for the IVT-7. In this case, LED "VIDEO " on the front panel lights up.

YC: The signal connected with YC IN on the rear panel is made into an input signal for the IVT-7. In this case, LED "YC" on the front panel lights up.

•SC INVERT ON/OFF

This switch is to invert the SC phase. The system SC phase can be adjusted by not less than 360 by means of the SC phase adjuster and this switch.

●LOCAL/REMOTE

LOCAL: Bypass, frame freeze and field freeze are controlled from the front panel. Remote control is impossible.

REMOTE: Bypass, frame freeze and field freeze are remote controlled. Control from the front panel is impossible.

●SC PHASE

This is to adjust the output-signal SC phase relative to the GEN-LOCK input signal.

●MOD BAL (R-Y/B-Y)

Adjust this in such a manner that the carrier leak of output signals can be minimized.

●CHROMA PHASE (Standard position ⓘ)

This is to adjust the chroma phase of output signals.

●CHROMA LEVEL

VIDEO OUT (Standard position ⓘ)

For adjustment of the VIDEO OUT and YC OUT chroma level.

YC OUT (Standard position ⓘ)

For adjustment of the YC OUT chroma and burst level.

●VIDEO PHASE

VIDEO PHASE adjuster.

●H. PHASE

This is to adjust the H phase of output signals relative to the reference signal when the reference signal is connected with GEN-LOCK IN on the rear panel.

●YC DELAY

This is to adjust horizontal luminance and chrominance phases. The adjustment can be made in 74-ns steps.

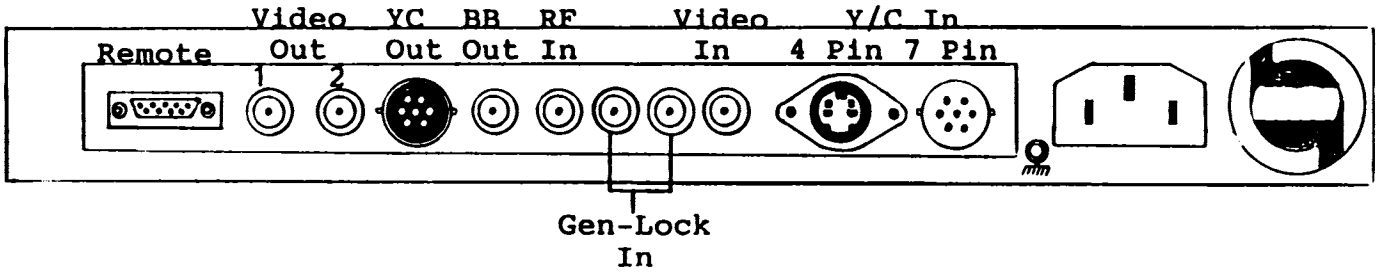
●DOC ON/OFF

When this switch is turned on while the RF output signal (for DOC) of a VTR is connected with RF IN on the rear panel, dropout compensation is made line by line.

●V. BLK ON/OFF

This switch is to remove before output VITS, VITC and other signals superinposed on the V. blanking of input signals or not to remove them (when OFF).

3-3 REAR PANEL



•VIDEO IN

For inputting composite video signals. When these are to be accepted as input signals for the IVT-7, open the front panel and set the input selection switch at "VIDEO".

•YC IN

This connector is for inputting YC358 and DUB signals. When they are to be accepted as input signals for the IVT-7, open the front panel and set the input selection switch at "YC".

•GEN-LOCK IN

This is for inputting the reference signal for synchronizing IVT-7 output signals. Connect stable BB or VBS signals to this. When no reference signal is

connected, the IVT-7 operates with the aid of the internal synchronizing signal generator.

●RF IN

When the DOC function is to be brought into operation, input the regenerated RF signal of a VTR to this connector and turn on the DOC ON/OFF switch.

●VIDEO OUT 1 and 2

Composite video signal output connectors. During the bypass time, VIDEO IN signals are outputted directly at VIDEO OUT 1.

●B B OUT

For outputting black burst signals synchronized with output signals. (Black burst signals can be used as reference signals for other equipment.)

●YC OUT

Output connector for YC358 signals. Refer to 1-5 for the cable to be used.

●REMOTE

Connector for connection with the TR-7 remote control unit. If the IVT-7 is to be operated by a signal from this connector, open the front panel and set the REMOTE/LOCAL switch to "REMOTE".

The signal arrangement of this connector is as shown below:

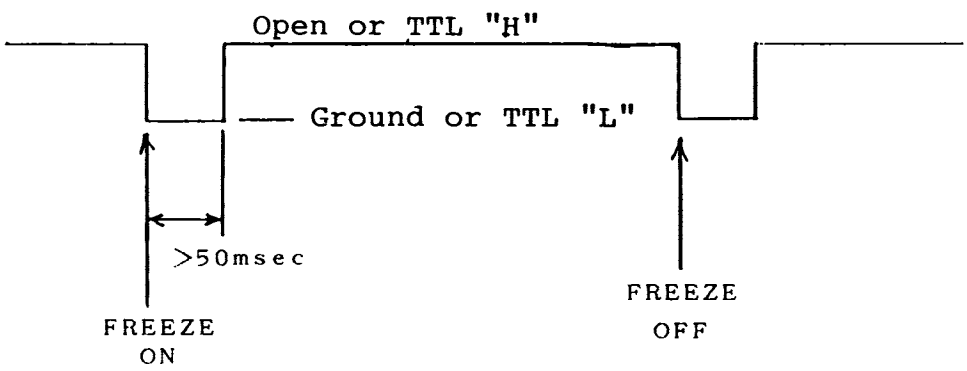
PIN 1 +5V

PIN 2 Ground

PIN 3 NC

PIN 4 Field freeze control input

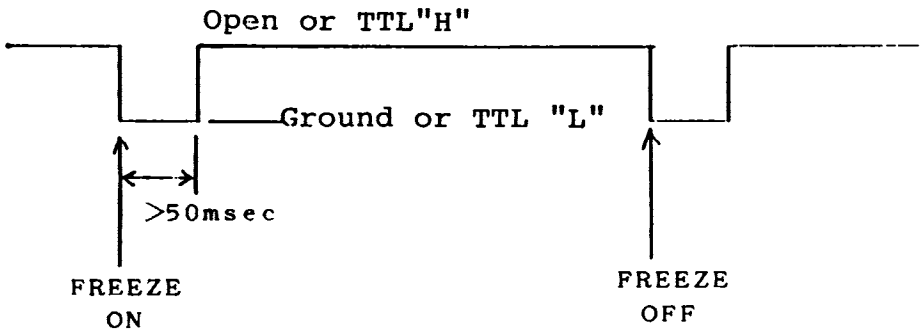
The field freeze state is obtained when this terminal and the ground are shorted, or when a TTL negative pulse (about 50 msec min.) is inputted. When the pulse is inputted again, the freeze state is brought to an end.



PIN 5 Frame freeze control input

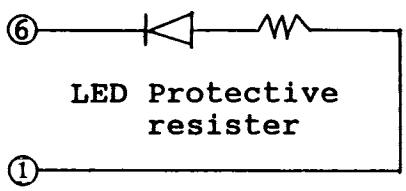
When this terminal and the ground

are shorted, or when as TTL negative pulse (about 50 msec min.) is inputted, the frame freeze state is obtained. This state is brought to an end when the pulse is inputted again.



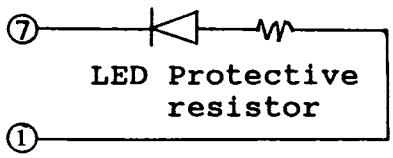
PIN 6 FIELD FREEZE ANSWER

TTL "L" when the IVT-7 is in the frame field state. When LED display is to be made outside , a protective resistor and an LED should be connected between this terminal and +5V.



PIN 7 FRAME FREEZE ANSWER

TTL "L" when the IVT-7 is in the frame field state. When LED display is to be made outside, connect a protective resistor and an LED between this terminal and +5V.



PIN 8 BYPASS CONTROL INPUT

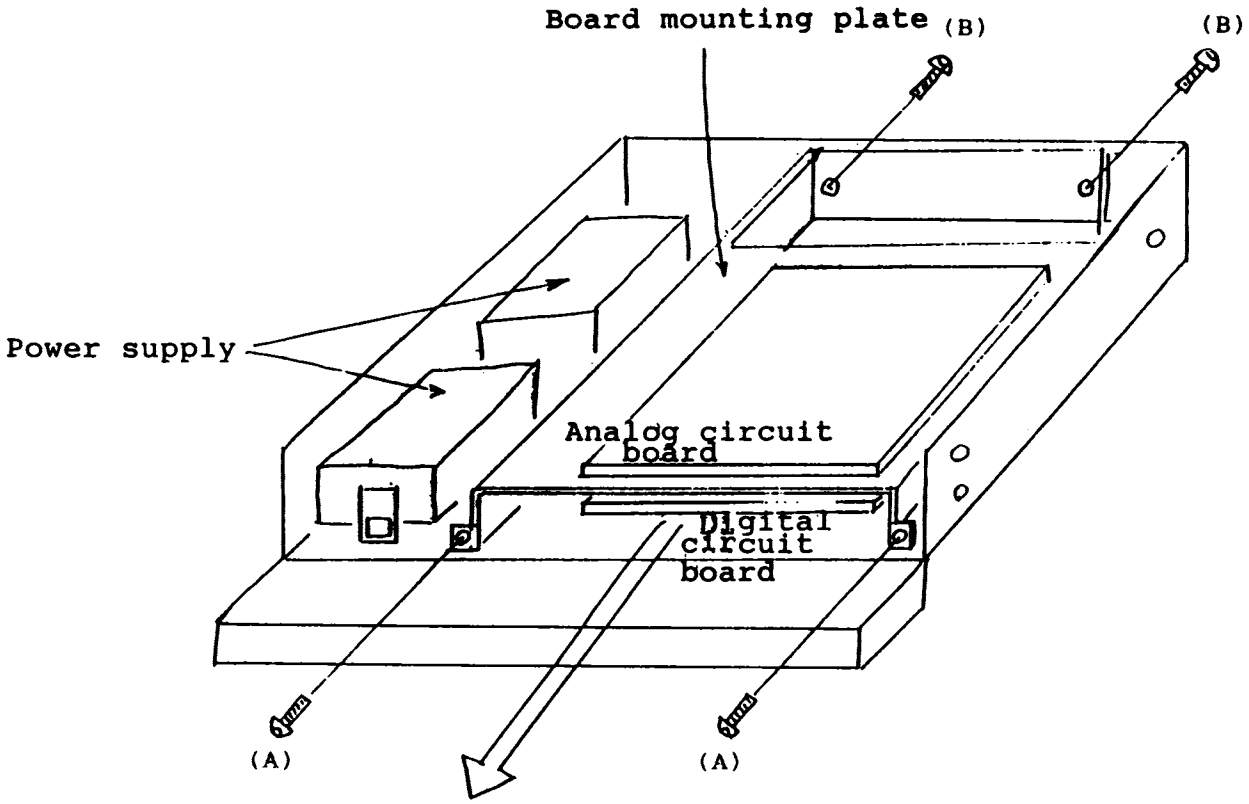
While this terminal and the ground are shorted, or while TTL "L" is inputted, the bypass state is held.

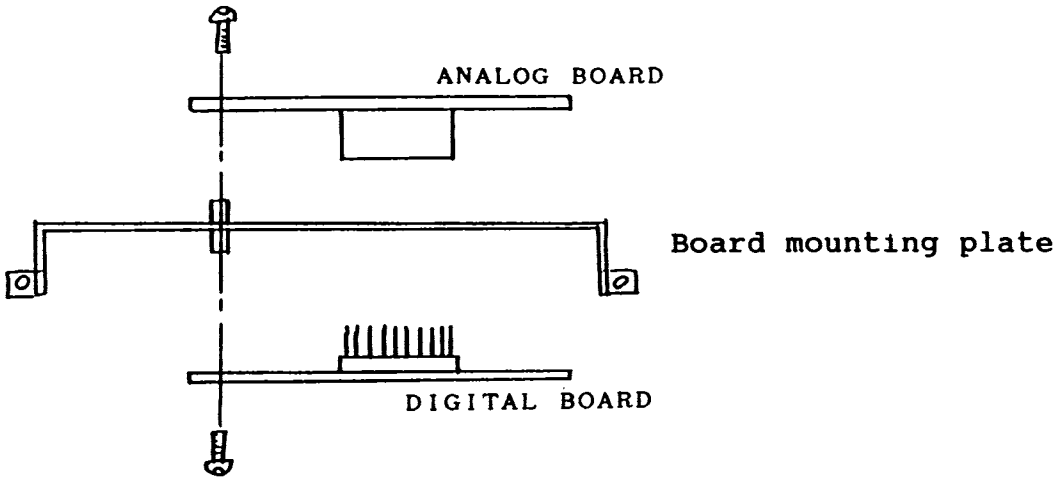
PIN 9 NC

(1) Noise reduction

When a noisy signal is inputted, turn VR10 on the digital printed circuit board clockwise. Then the Y-signal noise reduction circuit goes into operation, resulting in an about −3dB improvement. However, vertical resolution deteriorates slightly.

(2) How to pull out the board





1. Remove the cable connected with the rear panel connector.
2. Remove the screw (A) fixing the board mounting plate from the front side.
3. Remove the screw (B) fixing the board mounting plate from the front side.
4. Pull out the board mounting plate slowly toward the front.
5. Because the analog and digital boards are connected by a connector, take adequate care when detaching them.

(3)ABOUT YC IN

Although 4-pin and 7-pin connectors are provided as YC input connectors, use only one of them.

SPECIFICATIONS

Video Input	1) Composite	1 Vp-p 75 Ω
	2) S-Signal	Y : 1 Vp-p
	(Y/C 358)	C : 0.286 Vp-p burst level
Video Output	1) Composite 1	1 Vp-p 75 Ω
	2) Composite 2	1 Vp-p 75 Ω
	3) S-Signal	Y : 1 Vp-p
	(Y/C 358)	C : 0. 286 Vp-p burst level
Genlock In	Composite	1 Vp-p or BB 0.45 Vp-p 75 Ω
DOC In	RF 0.2 ~ 1.0 Vp-p 75 Ω	
System	Full Component Processing	
Sampling Freq.	Y : 13.5 MHz, C : 6.75 MHz 4:2:2 ratio (CCIR-601)	
Quantization	Y : 8 bit, C : 8 bit	
Correction Range	Full Frame Correction	

Automatic Chroma Control	Built-in	
Freeze Operation	Field Freeze / Frame Freeze	
DG, DP	2 %, 2°	
K-Factor (2T)	Composite	: Less than 3 %
	S-Signal	: Less than 1 %
Freq. response	Composite	: 3.0 MHz −3 dB
	S-Signal	: 5.5 MHz −3 dB
	Chroma	: 3.58 MHz ± 0.5 MHz −3 dB
S / N ratio	58 dB p-p/rms	
Ambient Temp.	10 ~ 40 °C (50 ~ 104°F)	
Humidity	0 ~ 90 %	
Power Supply	90 ~ 132 V (Switching regulator)	
Dimensions	424 (W) × 44 (H) × 380 (D)mm	
Weight	Approx. 5.5 kg	

Designed & Manufactured by

I.DEN® CORPORATION

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