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INNOVATIONS IN VIDEO
and AUDIO TECHNOLOGY

SERVICE MANUAL

PAL DIGITAL TIME BASE CORRECTOR **FA-400PS**

(4th EDITION: S/N. 1531561 ~ Higher)

FOR-A COMPANY LIMITED

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1 INTRODUCTION

1. General

FA-400PS Digital Time Base Corrector was developed using the latest digital video technology.
FA-400PS is compatible with both U-matic VTRs and NON-V-LOCK VTRs such as the 1/2" type.

2. Features and Applications

FA-400PS performs full frame time base correction and provides picture freeze capability. It generates a gen-locked output video signal and it can be connected directly with the optional VEC-400 Video Effect Controller to provide a range of video production effects including compression and multiple move.
FA-400PS is a compact (1 rack unit) product that offers high performance at very low cost and low power consumption. It is very versatile and can be used in a wide range of applications in production studios, ENG and EFP operations and as well as in educational, industrial and institutional video systems.
The most advanced circuit design is employed to ensure that FA-400PS gives reliable performance at all times.

*Full frame time base correction.
*Frame memory provides field or frame freeze with adjustable strobe freeze.
*Component processing.
*Dropout compensator.
*Adjustable automatic freeze to exclude inferior signals.
*Process amp controls (video level, chroma level, chroma phase, black level) easily accessible behind front panel.
*Optional freeze remote control.
*Optional VEC-400 Video Effect Controller to provide wide range of production effects.

3. Installation

FA-400PS is fully assembled and checked prior to shipping. After unpacking, check to ensure that no damage has been done during shipment. When installing this unit near other equipment, take extra care to keep any environmental changes (temperature, humidity, etc.) to a minimum, and make certain that the cooling fan and the radiators are not obstructed.

This unit can be rack-mounted in a standard 19" rack, or used as a table top unit. For rack mounting, a pair of rack slides is required.
Individual AC power cable and a remote control cable are required for the Video Effect Controller VEC-400 (Option) to provide the special effects function.
The unit can be operated on AC 200 - 240V and can be set to use at AC 100 - 115V (Jumper Connector is required to select the voltage range).
Take extra care with voltage selection.

4. Specifications

*Television Format	PAL standard
*Processing Format	Component processing
*Time Base Correction Range	2 fields
*Video Input	VBS 1Vp-p 75Ω
*Gen-lock Input	VBS 1Vp-p or BB 0.45Vp-p High impedance bridge
*DOC Input	RF 0.2V - 2 Vp-p 75Ω
*Video Output	VBS 1Vp-p 75Ω 2 outputs (By-pass can be made at output 1).
*Black Burst Output	BB 0.45Vp-p 75Ω 1 output
*ADV Sync Output	4Vp-p 75Ω
*Sampling Frequency	Luminance 8MHz Chrominance 2MHz
*Quantization	Luminance 8 bit Chrominance 6 bit
*Freeze	Selectable frame, field 1 and field 2
*Strobe Freeze	Auto strobe freeze (Freeze time is adjustable)
*Auto Freeze	When H sync signal is missing from the input signal, picture freezes automatically. (does not work in the shuttle mode)
*V Blanking	Internally selectable ON/OFF
*DG, DP	2%, 2°
*K Factor (2T)	3%
*Frequency Response	Luminance -3dB at 3MHz Chrominance -3dB at 0.8MHz
*S/N	Random Noise 55dB p-p/rms Hum Noise 1mVp-p

*Tilt	Sag H, V 1%
*Ambient Temperature	10 to 40°C (50 to 104°F)
*Power Supply	AC 180 - 264V (AC 90 - 132V)
*Power Consumption	71W (110VA)
*Dimensions	430(W) x 44(H) x 515(D) mm (17" x 1-3/4" x 20-3/8")
*Weight	Approx. 9Kgs (20 lbs)
*Optional Unit	VEC-400 Video Effect Controller with Remote Control Cable
	Remote Control Unit (for freeze operation only)

2 OPERATION

2-2-1 Adjustment and Control Switches

a) Front Panel

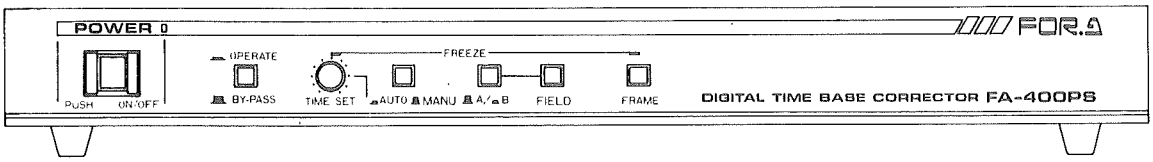


FIG. 1

NORM/BY-PASS	By pushing in the switch, video input can be by-passed to video output. (The switch lights up in the NORM mode.)
FREEZE-FRAME	By pressing the switch, the switch lights up and freeze frame becomes operative. By pressing the switch again, the frozen frame is released.
FREEZE-FIELD	By pressing the switch, the switch lights up and freeze field is operative. By pressing the switch again, the frozen field is released. In the auto freeze mode, if H sync is missed from the input video signal, this field lamp lights up and the auto freeze mode overrides all other controls. Either freeze switch can be selected even if the other mode switch is already pressed. (Latest pressed switch has priority.)
A/B	Designates field 1 or 2 for display. Field can be selected even after picture is already frozen.
AUTO/MAN	By pressing the switch, freeze and release are repeated at regular, predetermined intervals. Duration time of freeze and release are equal.
TIME SET	Duration time of auto freeze can be adjusted by turning this knob - clockwise increases freeze duration.

b) Internal Adjustors

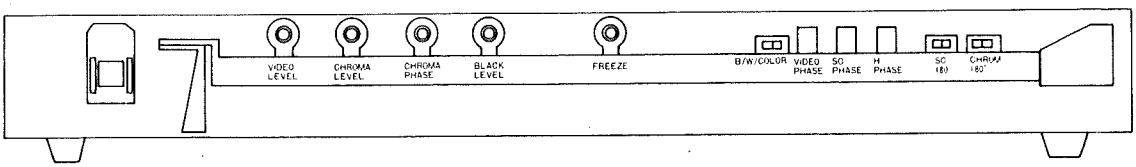


FIG. 2

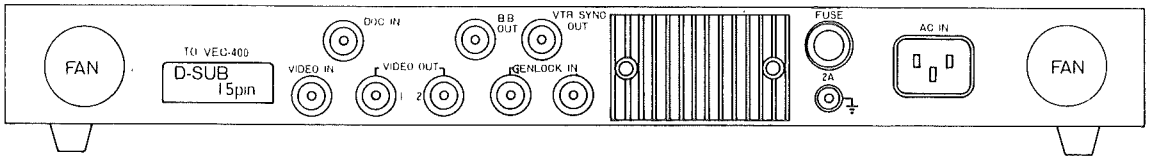
VIDEO LEVEL	Adjustor for the input video signal level. This is used to adjust the output video level of FA-400PS to the correct setting (Center position is standard.)
CHROMA LEVEL	Adjustor for chroma level of the input video signal. (Center position is standard.)
CHROMA PHASE	Adjustor for color phase of the output video signal. (Center position is standard.)
BLACK LEVEL	Adjustor for black level of the output video signal (Center position is standard.)
HORZ. PHASE	Adjustor for system H phase of the output video signal against the gen lock input signal.
SC PHASE	Adjustor for system phase of the output video signal against the input subcarrier signal.
SC 180°	Selection switch to reverse the SC phase of the output video by 180°. 360° phase adjustment can be performed by SC phase adjustor.
CHROMA 180°	Selection switch to reverse chroma phase of the output level by 180°.
MONO/COLOR	Selection switch for monochrome or color video output. When switch is set to MONO, chroma signal and burst signal are removed from output video.

FREEZE — This potentiometer controls the threshold level for the automatic freeze function which freezes the picture whenever an inferior signal is input. Adjust to set the range of missing H sync within the input video signal so that FA-400PS automatically freezes one field if H sync is missing. By turning the adjustor fully counter-clockwise, the range is set over 10H. In this range, most signals will not be frozen. By turning the adjustor fully clockwise, the range is set to approx. 4H. However, this function is not effective against guard band noise from the VTR if the VTR is in the shuttle mode.

DOC ON/OFF — ON/OFFswitch for DOC function.

DOC LEV — Adjustor for detection level (sensitivity) of DOC.

c) Rear Panel



TO VEC-400 — Connector for remote control. The input control signal from the remote connector will operate in parallel with the front panel operations.

VIDEO IN — Connector for the input signal.

VIDEO OUT 1 — Output for the composite video. When in BY-PASS mode, the input signal is bypassed here.

VIDEO OUT 2 — Output for composite video. Even when in BY-PASS mode, this remains the TBC output.

GEN-LOCK IN — Input connector for the reference signal. If no connection is made, internal sync is automatically selected.

VTR SYNC OUT — Sync output for V-LOCK VTRs. To advance VTR playback signal 8-15H against the GEN-LOCK input signal so that the time base is lined up and corrected. In special effect modes the advance rate will be changed.

B.B. OUT — Output connector for the black burst signal which has been synchronized with the VIDEO OUT. It can be used as the reference signal for other units.

DOC IN — By supplying RF signal from the VTR to the FA-400PS. DOC(Drop Out Compensator) function is operational. RF signal is used to detect any dropout of the VTR output signal.

2-2-2 Connection Examples

For connection refer to Fig. 3 and Fig. 4

Video input signal can be bypassed to VIDEO OUT-1.
A NON-V-LOCK VTR, such as 1/2" type, can be used without sync connection.
Some U-matic VTRs do not have external sync input, but can gen lock to an input video signal.
For this kind of VTR, ADV SYNC must be connected to video input of the VTR.
ADV SYNC leads approx. 1 field compared to GEN LOCK input signal.
FA-400PS works by internally generated sync if gen lock reference signal is not supplied.
Ground terminal should be connected to the ground.

FIG. 3 CONNECTION EXAMPLE - 1

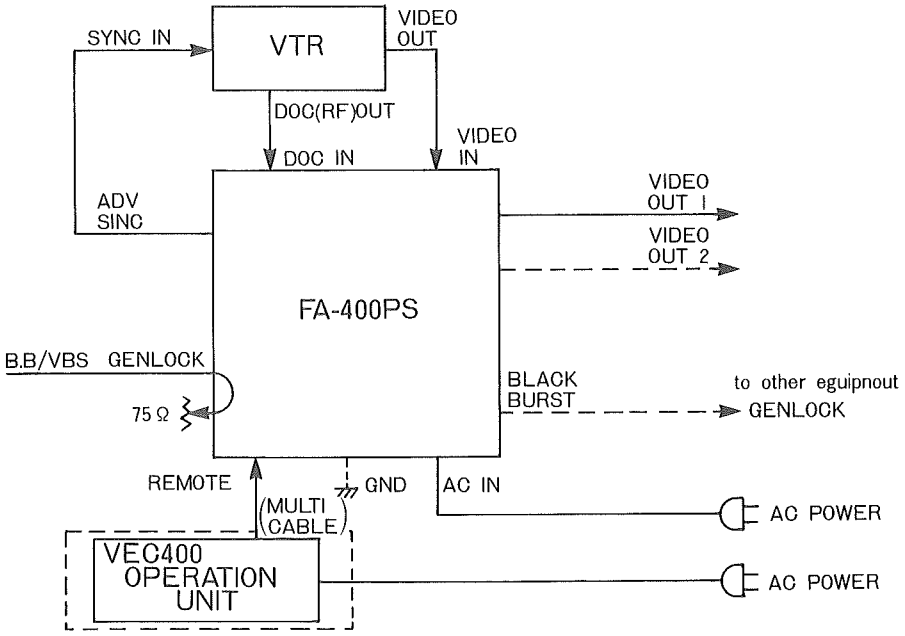
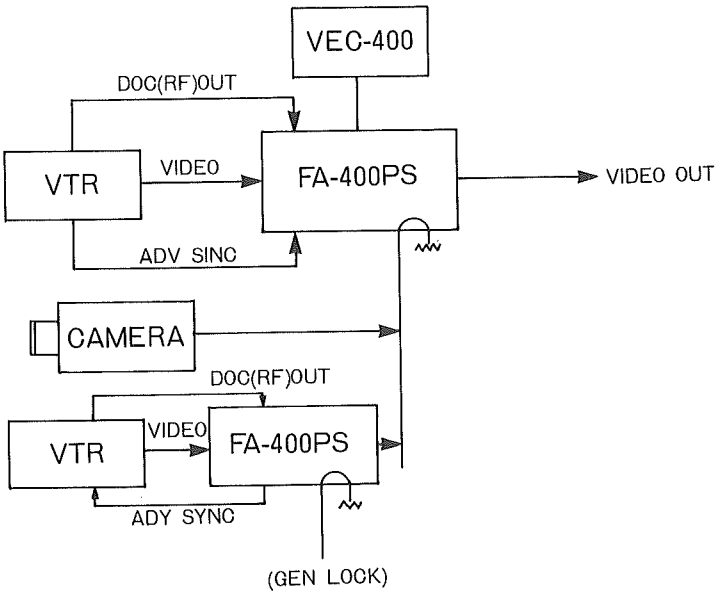


FIG. 4 CONNECTION EXAMPLE - 2



*In the compression mode using VEC-400, GEN LOCK video input signal can be used as background video.
(Direct output signal from VTR cannot be used for GEN LOCK input.)

NOTES

Take special care on the following points regarding the production effects when using VEC-400 Video Effects Controller.

NOTE 1
With a rapid action scene from the playback of a NON-V-LOCK VTR, flicker may occur on the picture due to a timing difference between the delayed field and the non-delayed field.

NOTE 2
Some VTRs have a reversed field relation between sync input and video output.
In this case, place the jumper plug JMP-10 to B on the VIDEO BOARD in the FA-400PS to reverse the field polarity of ADV SYNC output.

NOTE 3
DOC function is not available during INVERT, COMPRESSION and MULTIPLE MOVE modes of VEC-400.
Also DOC will not correct a stored picture from a NON-V-LOCK VTR.

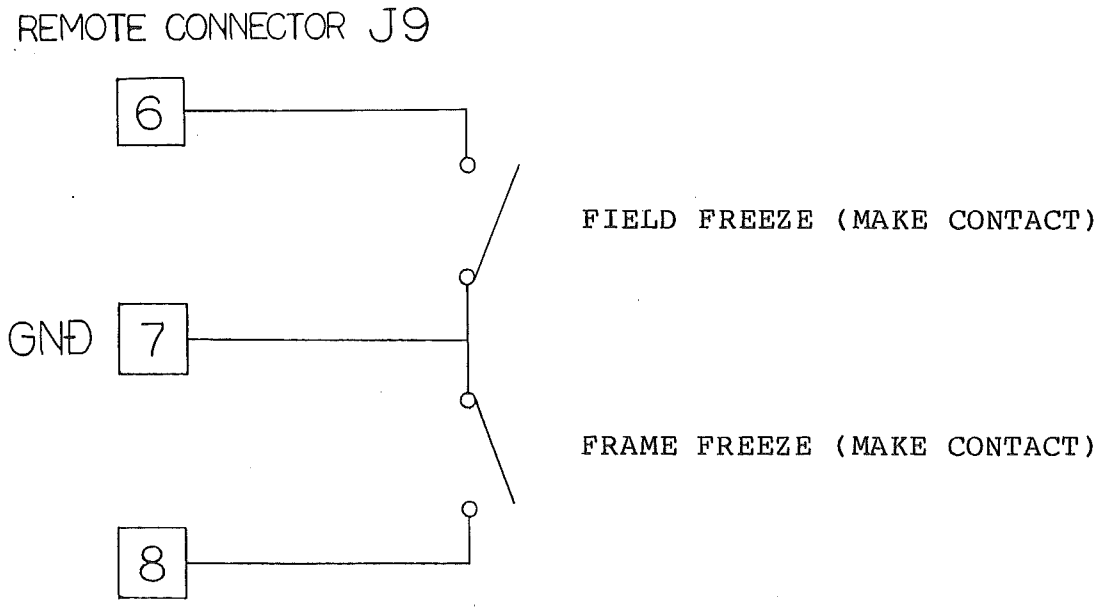
2-2-3 Other Functions

a. The adjustors behind the front panel, such as VIDEO LEVEL are each set to unity (factory adjusted), but can be adjusted if necessary.

b. For the auto freeze mode, both freeze and release duration periods are set to equal before shipping.
Duration can be changed by placing jumpers as follows.

RATE FREEZE/RELEASE	JMP-11	JMP-12	JMP-13	JMP-14
1/9	close	close	close	open
2/8	close	close	open	close
3/7	close	close	open	open
4/6	close	open	close	close
5/5	close	open	close	open
6/4	close	open	close	open
7/3	close	open	open	close
8/2	open	close	close	close
9/1	open	close	close	open

c. REMOTE FREEZE
FREEZE function can be remote controlled by connecting switches to the REMOTE connector on the rear panel. Remote control is not available while freeze switch (either field or frame) on the front panel is set to the REMOTE position, freeze functions on the font panel cannot be controlled locally.



2-2-4 Caution

When transporting the FA-400PS unit, or storing for a long period of time, use the original packing or similar material for packing. Use the 3A slow-blow fuse for AC 90 - 132V input, and 2A slow-blow fuse for AC 180 - 264V input.