



OPERATION MANUAL

Multifex DIGITAL IMAGE PROCESSOR

**MF-3000
MF-3000P**

FOR-A COMPANY LIMITED

OPERATION MANUAL

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**MF-3000
MF-3000P**

(2nd EDITION)

FOR-A COMPANY LIMITED

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New Beautiful 3D Effects from FOR.A

We're very pleased to announce the availability of the new upgraded version of the MF-3000P--the MF-3000PS. The MF-3000PS is the "friendliest", most affordable 3D DVE system available and now comes standard with page turn effects! Plus wave, burst, cross split, page scroll, accordion, split and ripple effects. As an added bonus, all MF-3000P can be easily upgraded!

New Features

- * Larger joystick makes controlling the MF-3000PS even faster
- * Easier to read LCD
- * Page turn effects now standard on all units. This makes the MF-3000PS the lowest cost DVE with page turn effects.
- * Inexpensive plug-in upgrade to dual channel—Most other units require the purchase of an expensive CPU.

FOR.A is extending its leadership in low cost DVE effects units by adding even more outstanding features and accessories in the months to come.

New Accessories

* MF-3000FD --- Off-line Storage Disk Drive

External dual disk drive for storage of approximately 80 programs per disk. Available from the end of May.

* Key Input

New PROM will be available from September 92.

* Page Turn 3D Effect EEPROM

18 Preprogrammed special page turn effects available immediately by simply selecting either "Move 1" or "Move 4" from the keypad.

Now available.

* Editor I/F, Light Source, Soft Edge, Soft Border, Cylinder Effects

Now being planned.

For further information, please refer to the attached confidential DVE comparison chart. The new operation manual is being printed this week and will follow in the mail next week.

By now, you should have received the new demonstration tape showing the new page turn effects.

Confidential DVE Comparision Chart

	FOR.A	Abekas	Abekas	Ampex	Pinnacle	GVG
Model Name	MF-3000PS	A-53D	A-51	ADO 100	New Prizm	DPM 700
Composite Input	Yes	Yes	Yes	Yes	Yes	Yes
Y/C Input	Yes	No	No	No	No	No
Frame Processing	No	No	No	Yes	Yes	Yes
TBC	Yes	No	No	No	No	No
Upgrade from 2D	Yes	No	No	Yes	No	Yes
Curve/Twist	Yes	Warp Option	Warp Option	Warp Option	Yes	No
Trail	Image Tracer	No	Warp Option	Option	Option	Option
Page Turn	Yes	Option	Warp Option	No	Yes	No
	1 Pass	2 Pass	2 Pass	2 Pass	1 Pass	?
One Touch Effect	Yes	No	No	No	No	No
Key Input	9/92 PROM	Option	Option	Option	Option	Yes
Dual Channel	Optional Card	Option	Option	Option	Option	Option
Intersection	Optional Card	No	No	No	No	No
Price	3,500K¥	12,000K¥	5,800K¥	7,800K¥	7,000K¥	5,284K¥
Light Source	Planning	No	Option	No	Option	No
Cylinder	Planning	Dual Ch	Dual Ch	No	DVEator Op.	No
Zipper	Yes	No	No	No	"	No
Sphere	Planning	Dual Ch	Dual Ch	No	"	No
Ripple	Yes	No	No	No	"	No
Soft Edge	Planning	No	No	No	Yes	No
Soft Border	Planning	No	No	No	Yes	No
Anti-Alias Filter	Vertical	Some	Some	Yes	Yes	Yes
Floppy Disk	MF-3000FD	Yes	Yes	Yes	Yes	Yes
Editor I/F RS-422	Planning	Yes	Yes		Yes	Yes
Parameter Display	Some	Some	Some	Yes	Yes	Some
Drop Shadow	No	Option	Option	No	No	Some
Price						
Single Channel	3,500K¥	12,000K¥	5,800K¥	7,800K¥	7,000K¥	5,284K¥
With Trail	4,300K¥	---	7,800K¥			6,834K¥
With Page Turn	4,300K¥		16,000K¥			---
Trail & Page Turn	5,100K¥	---	20,000K¥			---
Dual Channel	5,550K¥	24,500K¥	13,600K¥			8,404K¥
D. Ch/PT/Trail	7,900K¥		20,000K¥			9,954K¥
						No Pg Turn

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SECTION 1. SPECIFICATIONS AND INSTALLATION

1-1. INTRODUCTION

The MF-3000/3000P Multifex Digital Image Processor brings the world of digital video effects to even the smallest of production or editing studios at an exceptionally affordable price. Even so, its design includes an impressive array of powerful effects features based on state-of-the-art digital technology, is extremely user friendly and has a flexibility that allows easy and simple expansion of the system to meet future needs.

The built-in infinite correction-range TBC allows input and output of S-VHS format in addition to 1/2" and 3/4" VTR formats (see features*), making it possible to incorporate the MF3000/3000P into existing production systems without additional equipment or expense.

In addition to the standard 2-D special effects, 3-D rotation, perspective, x8 zoom, twist, curve and other complex special effects can be performed according to extremely simple operational procedures which use the 3-axis joystick of the operation unit.

If you have already invested in FOR.A's MF-1000/1000P, your unit can be quickly upgraded to the performance level of the MF-3000/3000P by simply purchasing the optional MF-1000/1000P-3D.

This manual covers both the NTSC (MF-3000) and PAL (MF-3000P) versions of this system as well as upgraded versions of the MF-1000/1000P. Be sure to always reference the correct format for your unit.

1-2. FEATURES

- Compact and lightweight.
- Composite, reference video and DOC inputs, plus Y/C 358 (NTSC) or Y/C 443 (PAL)
- Designed-in programmed move trajectory patterns.
- Large selection of self-contained event memories; including fixed pattern, fixed move trajectory pattern, program, and program sequence.
- Capable of memorizing 32 different programmed sequences (program combinations/merges) containing up to 30 programs each.
- Capable of memorizing 20 different programs containing up to 30 steps (keyframes) each.
- Battery backed up memory to avoid program loss.
- 100 different effects patterns available.
- Main effects functions include:
 - Compression, x8 zoom and positioning.
 - Rotation (X,Y,Z axis): Auto A/B switching allows almost instant transition between CH A and CH B inputs.
 - Changeable perspective (based on X,Y,Z axis rotation)
 - Variable aspect ratio and independently variable H/V size.
 - Colored matte and hard edged border with adjustable luminance, saturation, hue.
 - Standard, push and compressed wipes.
 - Negative, paint, mosaic (Y signal only), field freeze, strobe freeze, strobe negative.
 - Curve and twist plus flip, tumble and spin effects.
 - Multi-move (1~9 x 1~9): H or V plus H and V phase inverted pictures
 - ∞ Multi Function
 - Cropping and fade functions.
- TAKE operations can be performed either automatically, manually (fader lever) or by external switcher control during effects operations.
- Built-in infinite correction-range 5.0 MHz TBC
- GPI interface.
- User friendly operation unit can be connected with standard coaxial cable.
- Input change section offers 2 input options: manual and automatic.
 - *[Optional TBC board, MF1000TU (MF-3000) or MF1000PTU (MF-3000P), is recommended if 2 VTR inputs are required for operation of your system.]
- Process output video [composite and Y/C 358 (NTSC) or Y/C 443 (PAL)] produced by effects operations can be key mixed with background video (manual mixing possible).
 - NOTE: This function can only be used when a genlock reference is supplied to the MF-3000 /3000P. Also, a composite signal must be supplied to the background video connector if a composite key mix output is required or a Y/C358 (Y/C443) signal if a Y/C358 (Y/C443) key mix output is required.

1-3. SPECIFICATIONS

NOTE: Unless otherwise indicated, listed specifications apply to both the MF-3000/3000P.

TV Standard NTSC (MF-3000)
PAL (MF-3000P)

Video Input Signals

Composite 1.0Vp-p, 75Ω,
2 inputs (CH1 and CH2),
BNC connectors

**Y/C358
(MF-3000)** Y: 1.0Vp-p
C: 0.286Vp-p (burst),
75Ω, 2 inputs
(CH1 and CH2),
4-pin S connectors

**Y/C443
(MF-3000P)** Y: 1.0Vp-p
C: 0.3Vp-p (burst),
75Ω, 2 inputs
(CH1 and CH 2),
4-pin S connectors

Genlock B.B. 0.429Vp-p (NTSC),
B.B. 0.45Vp-p (PAL),
75Ω or loopthrough,
1 input, BNC connector

DOC RF 0.2Vp-p to 1.0Vp-p,
75Ω, 2 inputs
(CH1 and CH2),
BNC connectors

Background Video In

Composite 1.0Vp-p, 75Ω,
1 input, BNC connector

**Y/C358
(MF-3000)** Y: 1.0Vp-p
C: 0.286Vp-p (burst),
75Ω, 1 input,
4-pin S connector

**Y/C443
(MF-3000P)** Y: 1.0Vp-p
C: 0.3Vp-p (burst),
75Ω, 1 input,
4-pin S connector

Video Output Signals

Composite 1.0Vp-p, 75Ω, 2 outputs,
BNC connectors

**Y/C358
(MF-3000)** Y: 1.0Vp-p
C: 0.286Vp-p (burst),
75Ω, 1 output
4-pin S connector

**Y/C 443
(MF-3000P)** Y: 1.0Vp-p
C: 0.3Vp-p (burst)
into 75Ω, 1 output
4-pin S connectors

Adv. Sync 4.0Vp-p, 75Ω,
2 outputs,
BNC connectors

**Key out
(composite)** 1.0Vp-p, (No burst),
75Ω, 1 output
BNC connector,
hard key

Internal Video Processing

**4:2:2 Component
Processing** Only luminance signals
for interpolation

Field Processing Employed for special
effects processing

**Anti-aliasing
Filter** For 2-dimensional
use

Other

**Sampling
Frequencies** Y: 13.5MHz
C: 6.75MHz

Quantization Y and C,
8 bits each

DG, DP 2%, 2°

**K-Factor
(2T pulse)** 2%

**Frequency
Response** Y: 5.0MHz /-3dB
C: 3.58MHz ±0.5MHz /
-3dB (NTSC)
C: 4.43MHz ±0.5MHz/
-3dB (PAL)

S/N Ratio ≥55dB p-p/rms
(random noise/without
quantizing noise)

Time Base Correction Range	2 fields	Options	MF-3000/3000P: Slide rail set Main unit rack mount kit, GPI connector Extender board MF-3000: *Additional TBC board, MF1000TU MF-3000P: *Additional TBC board, MF1000PTU
Memory	100 Keyframes (with battery back-up) 20 programs (with battery back-up)		
Operating Temperature	10 to 40°C (43 to 104°F)		
Power Supply	100/117V AC (NTSC) 220/240VAC (PAL) 50/60Hz		
Power Consumption	<u>Single TBC operation</u> Main unit: Approx. 110W (160VA) [NTSC]; 125W (200VA) [PAL] Operation unit: Approx. 21W (33VA) [NTSC]; 20W (42VA) [PAL]		Note: The optional MF-1000TU or MF-1000PTU TBC processor board is recommended if your system requires A/B switching of VTR inputs (VTR input to both channels/dual TBC board configuration). In the standard (single TBC) configuration, A/B input channel selection of VTRs or asynchronous input signals may not be possible.
	<u>Dual TBC operation (option)</u> Main unit: Approx.135W (190VA) [With optional MF1000TU (NTSC)], Appox. 150W (233VA) [With optional MF1000PTU (PAL)], Operation unit: Approx. 21W (33VA) [NTSC] 20W (42VA) [PAL]		
External Dimensions	Main unit: 430(W)x 221(H) x 550(D) mm [17"x8 3/4"x22"] Operation unit: 480(W) x 98(H)x 265(D) mm [19"x3 7/8"x10 1/2"]		
Weight	Main unit: Approx. 23 kg [50.7 lb] Operation unit: Approx. 11 kg [24.3 lb]		

Note: The preceding specifications are general in nature and subject to change without prior notice.

1-4. INSTALLATION

a) Unpacking

The MF-3000/3000P is fully assembled, checked and adjusted prior to shipment and is ready to operate immediately upon unpacking.

Check your received items against the packing list below.

ITEM	QUANTITY
Main Unit	1
Operation Unit	1
AC Cords	2
Coaxial Cable (15M)	1
Operation Manual	1

b) Check

Check to ensure no damage has occurred during shipment. If damage has occurred, or items are missing, inform your supplier immediately. In addition, inspect printed circuit boards and other connections as they may have become disconnected or loosened during transit due to vibration .

C) Power Supply

Verify you have the correct system for your voltage specifications prior to applying power. The MF-3000 operates on 110/117VAC, 50/60Hz; while the MF-3000P operates on 220/240VAC, 50/60Hz. The required voltage and system should be specified at time of purchase.

d) Grounding

To protect operators against electrical shock both units are fitted with 3-pin power cords, which ground the units simply by connection to an AC outlet. In the event your power source has a 2-pin outlet, use a 2-pin to 3-pin adaptor and ground the ground terminal on the rear panel of each unit.

e) Installation

Avoid using this system in areas having high temperature, high humidity or excessive dust. Adequate ventilation is required for optimum performance, so ensure no other equipment is located or installed closer than 5cm to either unit.

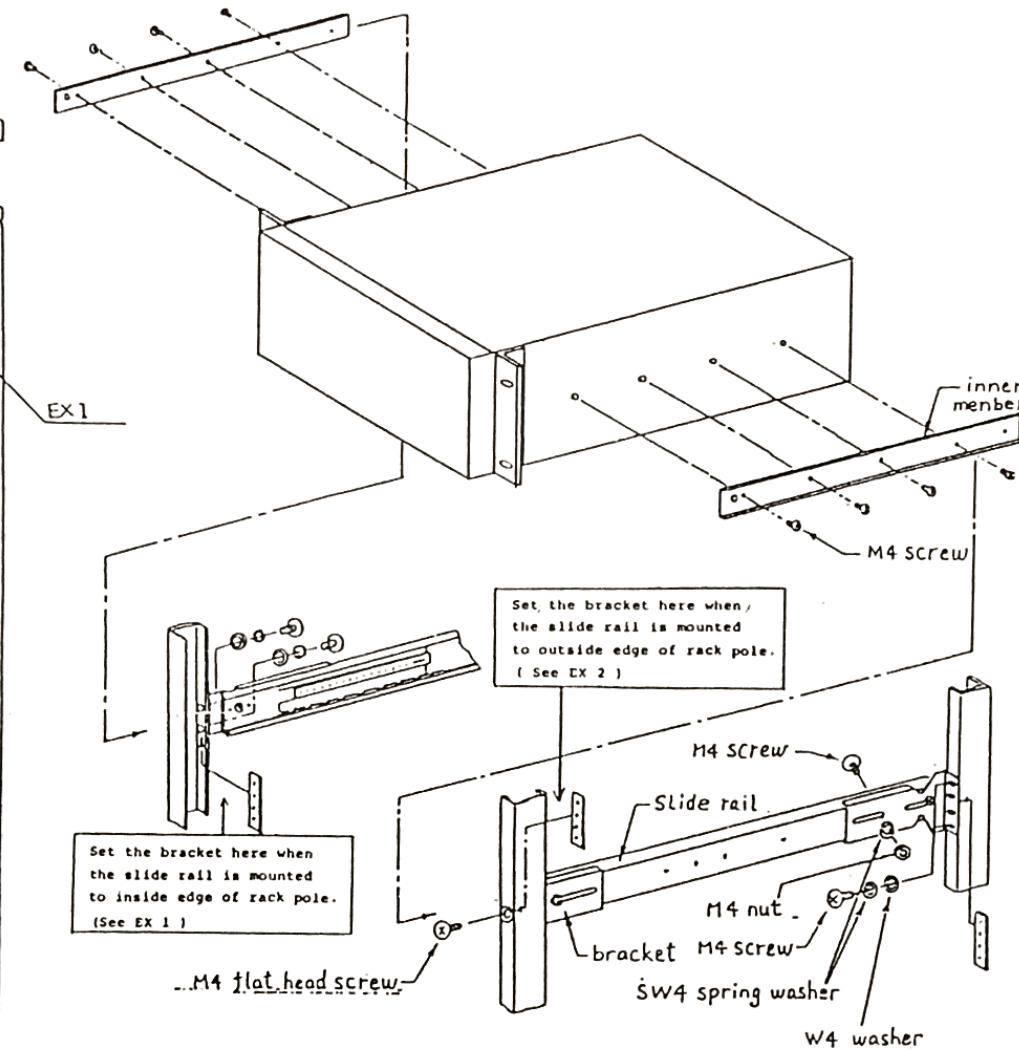
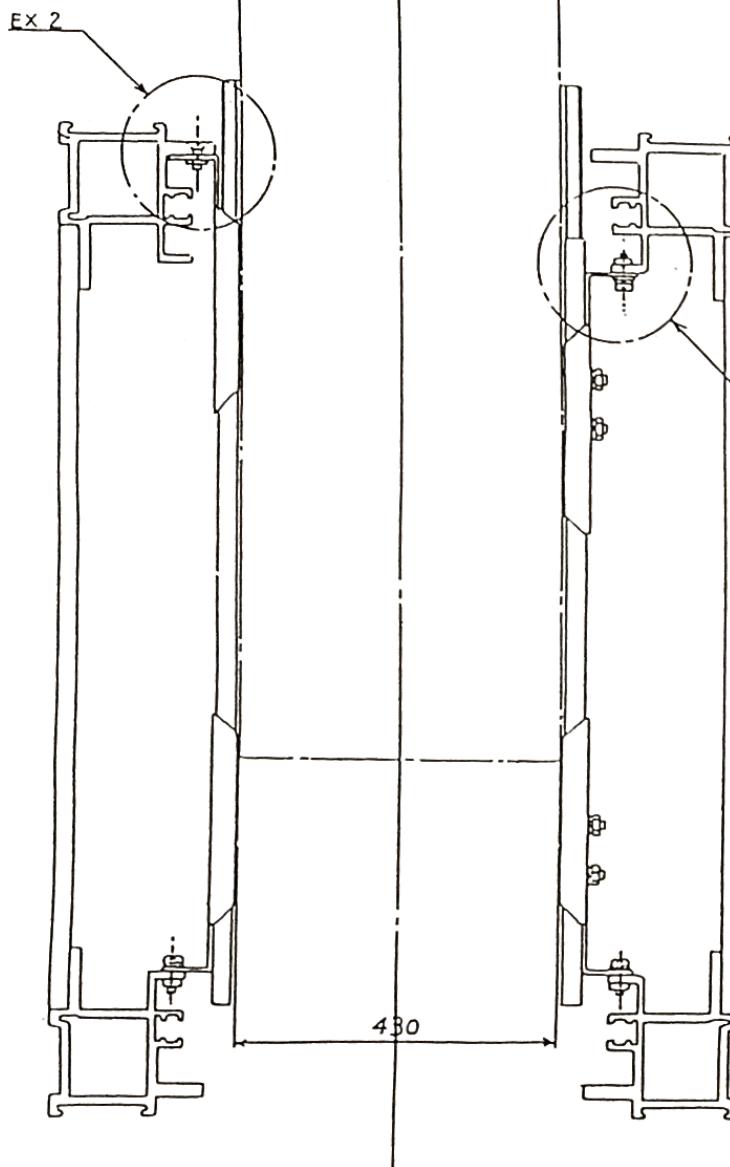
f) Desk or Tabletop Usage

The operation unit is designed for convenient mounting into console control units, etc., but can also be used as a tabletop unit since it comes equipped with rubber feet mounted on the baseplate.

g) Rack Mounting

When rack mounting the system, remove the rubber feet and use the optional mounting brackets. For optional slide rail mounting, see figure 1-1 on the next page.

1-5

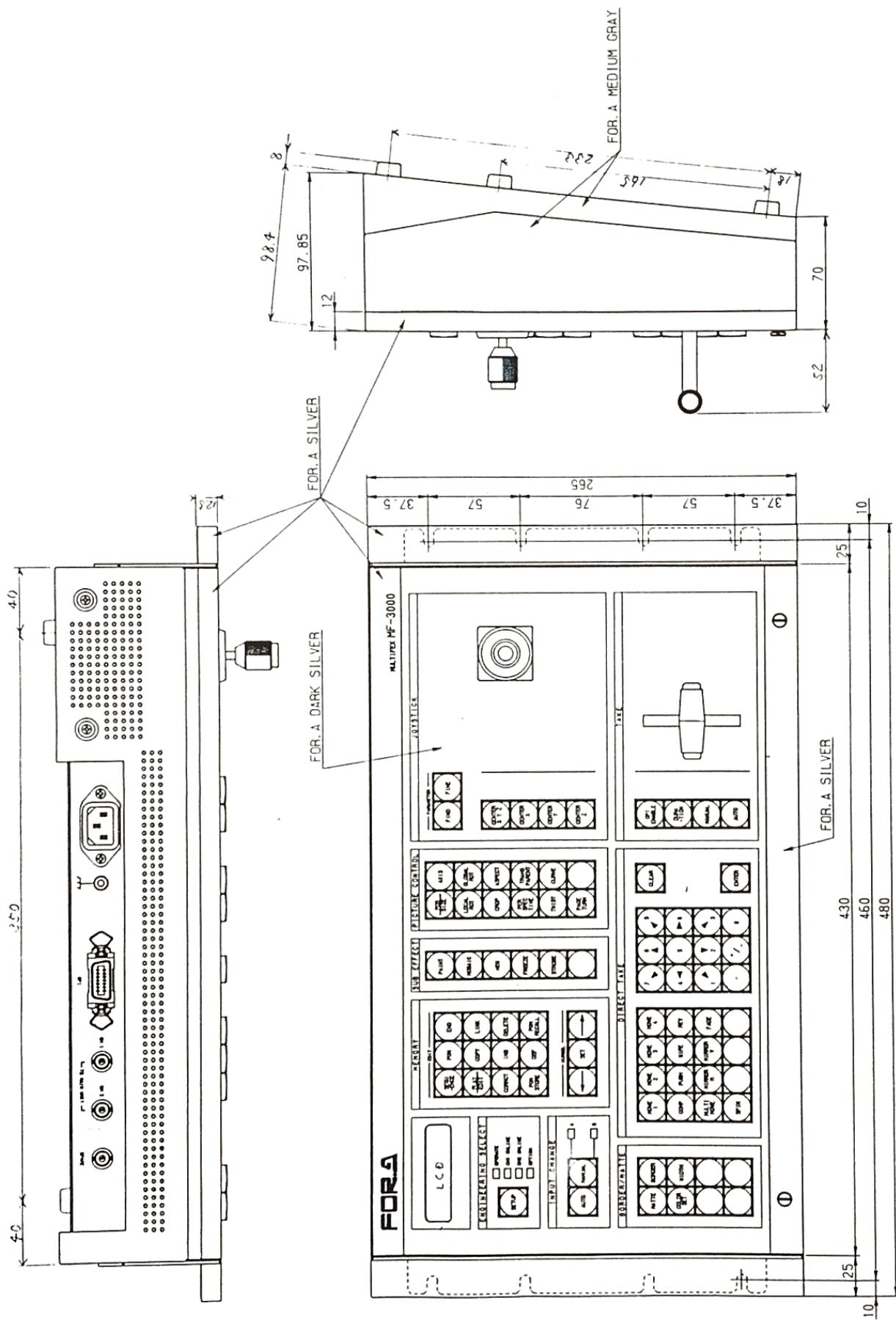


'Using C-203-20LEX (SETTSU KINZOKU) slide rail

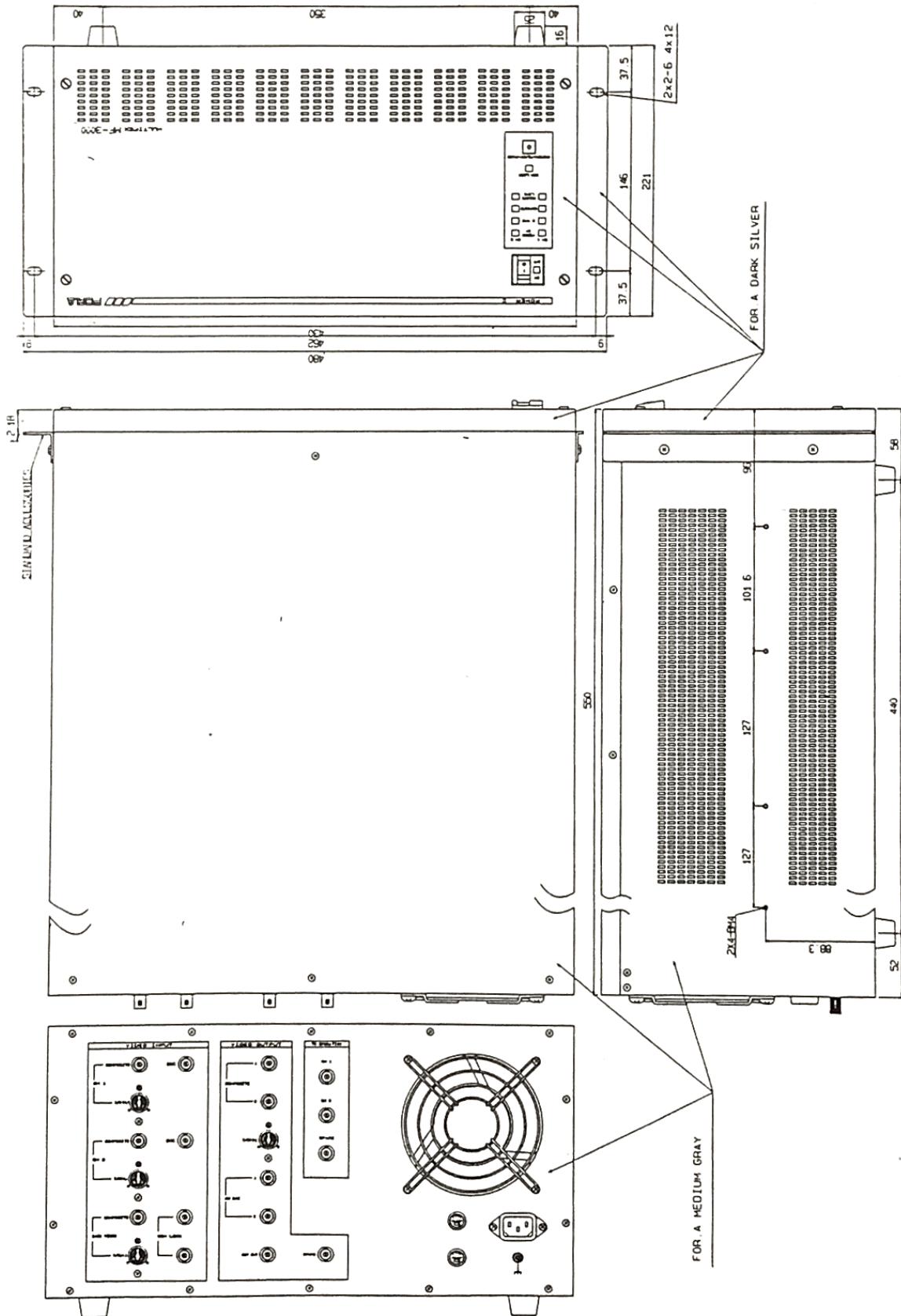
FIG. 1-1

1-5. EXTERNAL DIMENSIONS

1) OPERATION PANEL



2) MAIN UNIT

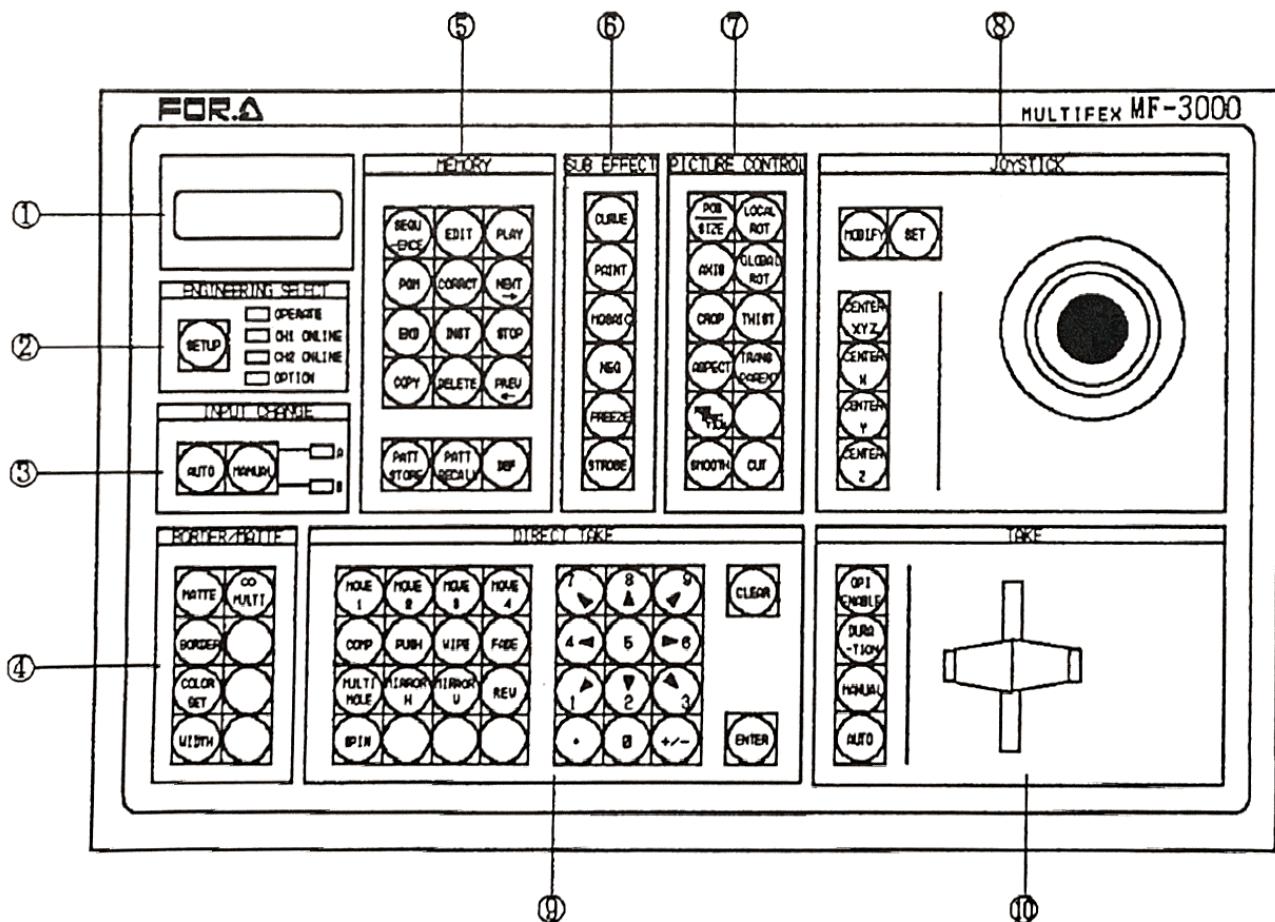


SECTION 2. PANEL DESCRIPTIONS

This section describes the location and function of the controls and indicators normally used during operation of the MF-3000/3000P. Controls and switches that are not mentioned should not be manipulated or adjusted, except by individuals who have had complete factory training on the system. Unnecessary adjustment of these controls and switches could cause permanent damage to the unit.

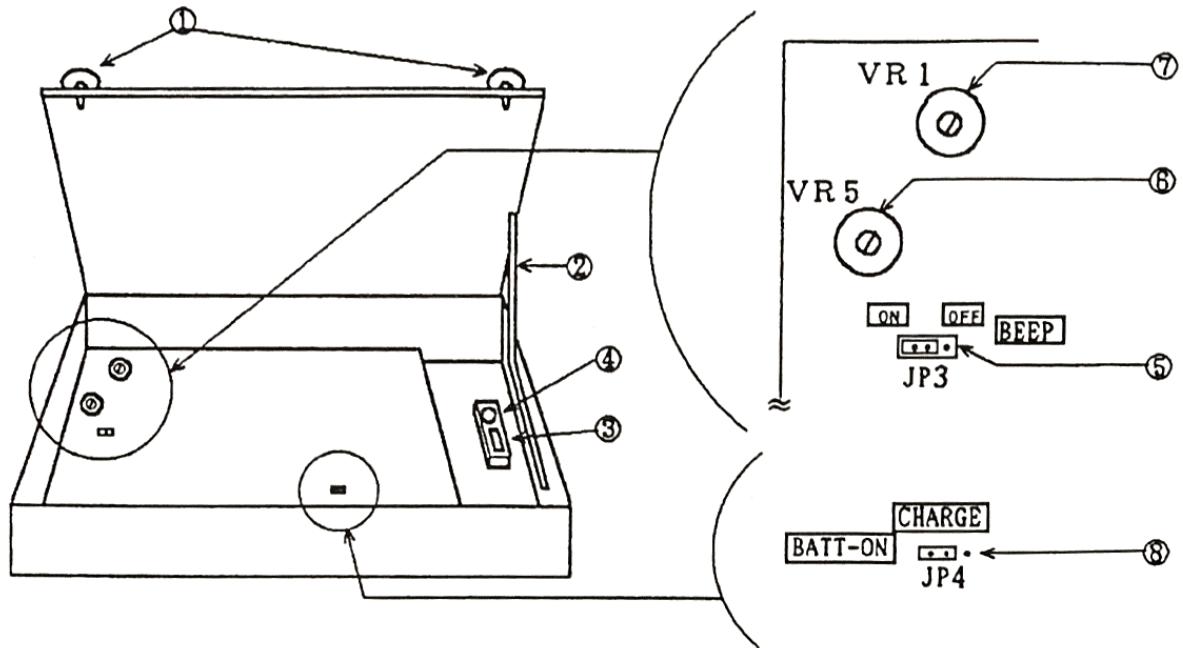
2-1. OPERATION UNIT

OPERATION PANEL



- 1) LCD display/prompt
- 2) ENGINEERING SELECT setup switch and status indicators
- 3) INPUT CHANGE functions and indicators
- 4) BORDER/MATTE functions (plus ∞ MULTI function)
- 5) MEMORY functions (plus DEFault function)
- 6) SUB EFFECT functions
- 7) PICTURE CONTROL functions (plus SMOOTH and CUT functions)
- 8) JOYSTICK (plus auto-centering and MODIFY/SET functions)
- 9) DIRECT TAKE functions (plus numerical keypad and CLEAR/ENTER functions)
- 10) TAKE functions (plus fader lever and GPI ENABLE switch)

OPERATION UNIT INTERIOR



1) Screws

These two screws must be loosened prior to lifting the operation panel to gain access to the interior of the operation unit.

2) Lock Arm

Locks in place to support the operation panel when raised for internal access. Release the arm and slowly lower the panel when closing the unit.

3) Power ON/OFF switch

Supplies power to the operation unit when switched to ON ([I] side). (Factory set to ON prior to shipment.)

CAUTION

DO NOT touch or move the joystick when powering on the unit or improper response could result! For example, joystick center position could be misaligned or image positioning may not hold.

4) Fuse holder

Uses a 1A (slow blow) fuse : 100/117 VAC (MF-3000) or a 1A (slow blow) fuse : 220/240VAC (MF-3000P).

5) Tone ON/OFF jumper

Setting enables (ON) or disables (OFF) a touch tone. (Factory set to ON prior to shipment.)

6) Volume control

Used to adjust touch tone volume .

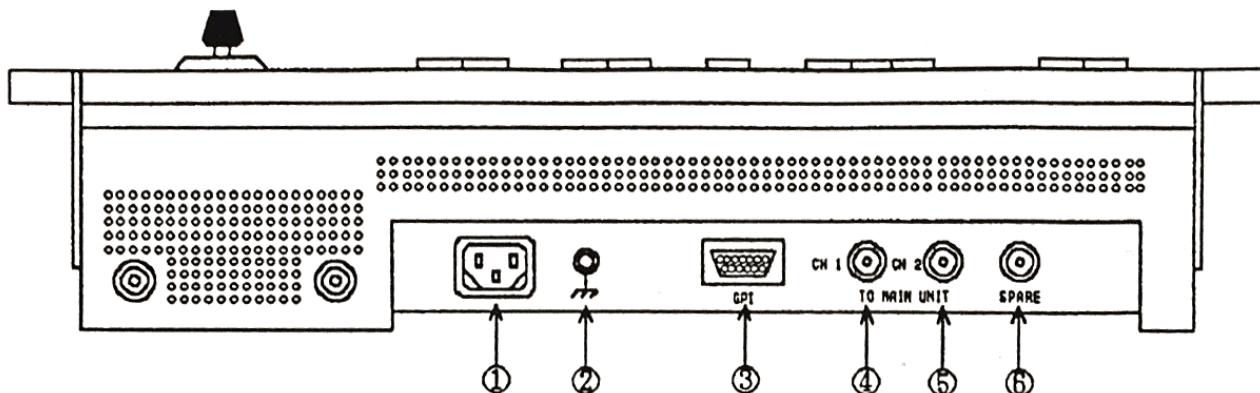
7) Contrast control

Used to adjust the contrast level of the LCD display.

8) Battery charge ON/OFF jumper

Setting enables (ON) or disables (OFF) the memory backup battery. Normally set to "BATT-ON" during operation.

REAR PANEL



1) AC power socket

2) Ground terminal

3) GPI connector

Used to input external control signals to the operation panel.

(A) Connector pin designations and information are below:

PIN NO.	DESCRIPTION
1	AUTO TAKE
2 ~ 12	NC (no connection)
13	GND (ground)
14	GND (ground)

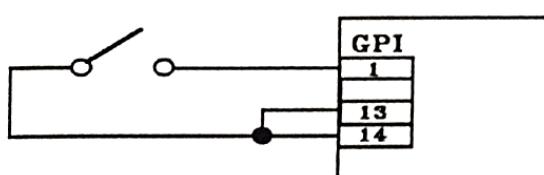


Make contact or low level (TTL)
Pulse width: 100ms or more

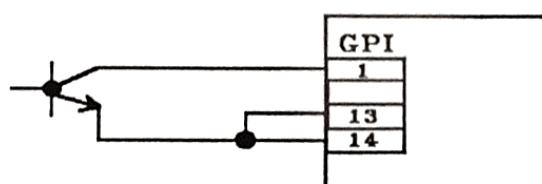
Compatible plug: Soldered cup type 57-30140 (Amphenol 14-pin plug)

(B) Interface circuit examples

(1)



(2)



Open collector equivalent to 75452.

4) TO MAIN UNIT/CH1

BNC connector. Used to send control signals to the CH1 input on the rear panel of the main unit.

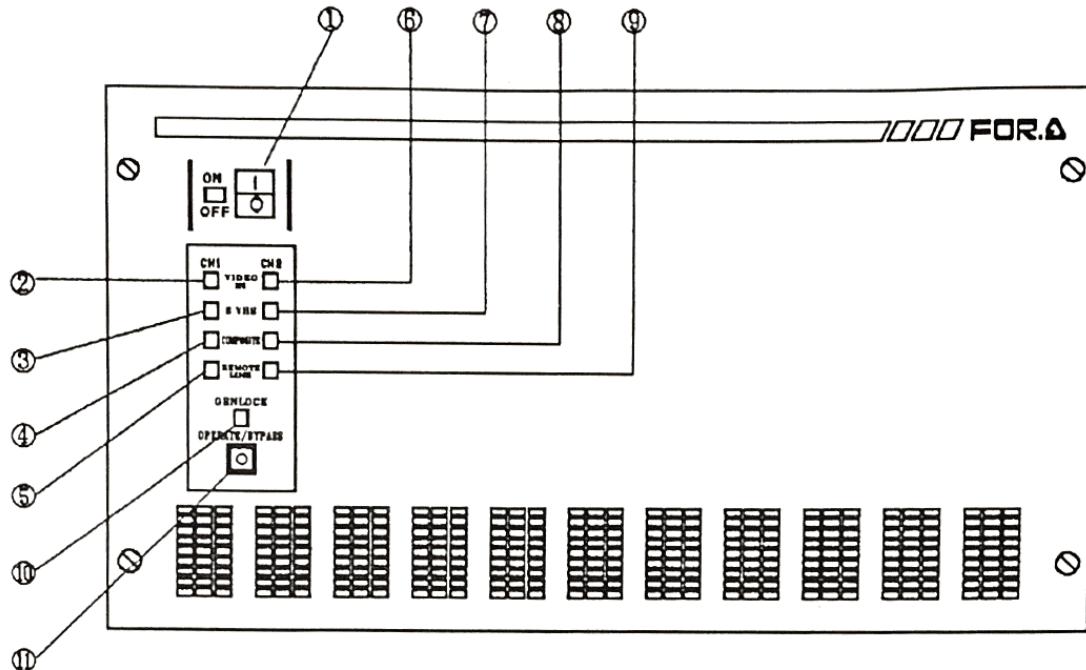
5) TO MAIN UNIT/CH2

For future use.

6) SPARE connector

2-2 MAIN UNIT

FRONT PANEL



1) POWER

Power ON/OFF switch. Indicator lights when power is ON.

CAUTION

After power OFF, always wait at least 3 seconds before switching power back ON.

2) CH1 VIDEO IN

Lights when a video signal is input to the input processing circuit via either the CH 1 or CH2 input connector on the back of the main unit while the unit is operating in the standard single TBC/single channel format. However, if the unit is operating in either the dual TBC/single channel or dual channel format, this indicator will only light when a video signal is input via CH1. It will not light if a signal is input via CH2 and no signal is input to CH1.

3) CH1 S VHS

Lights when CH1 process video input is S-VHS format.

4) CH1 COMPOSITE

Lights when CH1 process video input is composite format.

5) CH1 REMOTE LINE

Lights when the main and operation units are connected via the accessory coaxial cable and both are fully operational.

6) CH2 VIDEO IN

This indicator will only light when the unit is operating in either the optional dual TBC/single channel or dual channel format and a video signal is input to the input processing circuit via the CH2 input connector on the back of the main unit. However, if the unit is operating in the standard single TBC/single channel format, this indicator will not light, even if a video signal is input via the CH2 input connector.

7) CH2 S VHS

Lights when CH2 process input is S-VHS format.

8) CH2 COMPOSITE

Lights when CH2 process input is composite format.

9) CH2 REMOTE LINE

For future use. Currently non-operational.

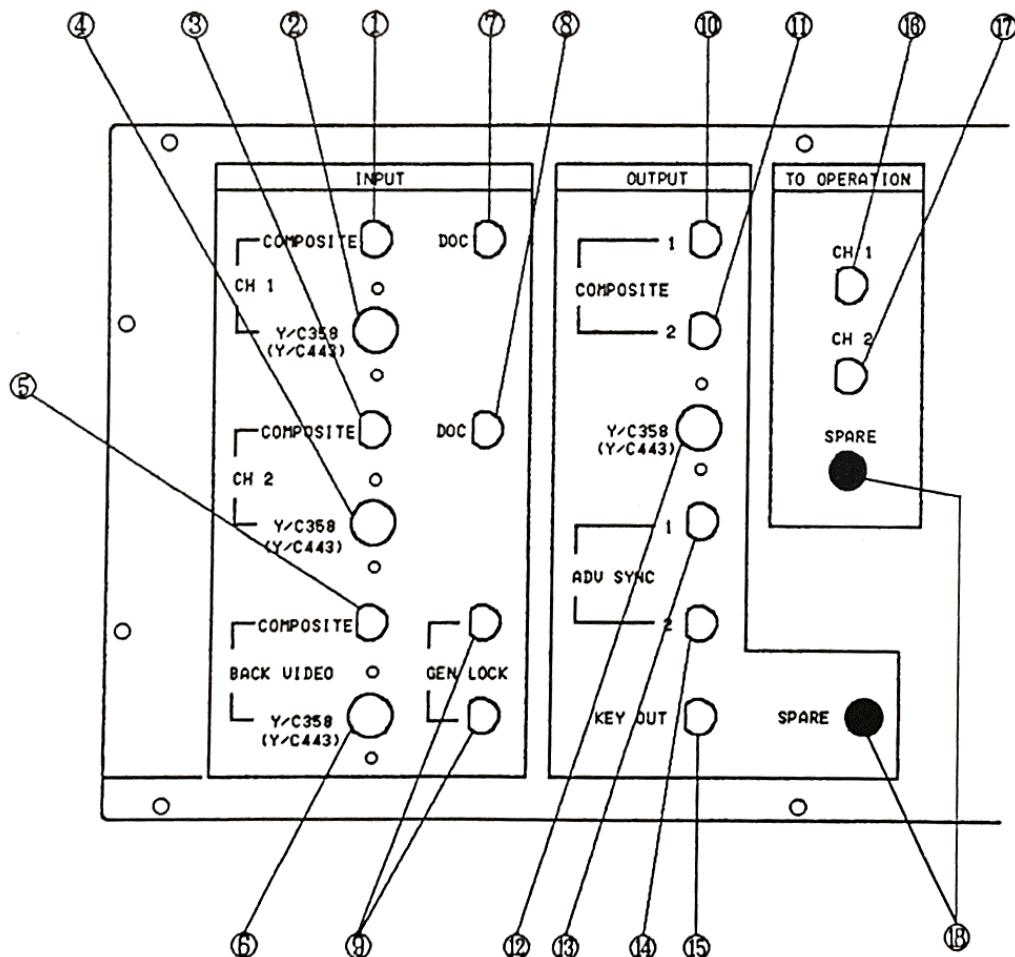
10) GENLOCK

Lights when genlock signal input is present.

11) OPERATE/BYPASS

This indicator switch lights when set to OPERATE, which is the normal operational setting. It will not light when set to BYPASS. When in BYPASS, input signals will be directly bypassed through the unit without processing.

REAR PANEL



1) CH1 COMPOSITE

CH1 composite video input connector.

2) CH1 Y/C358 (NTSC) : CH1 Y/C443 (PAL)

CH1 Y/C358 (Y/C443) video input connector.

3) CH2 COMPOSITE

CH2 composite video input connector.

4) CH2 Y/C358 (NTSC) : CH2 Y/C443 (PAL)

CH2 Y/C358 (Y/C443) video input connector.

5) BACK VIDEO COMPOSITE

Composite background video input connector. Used to perform internal key mix operations.
(Must be synchronized to GEN LOCK input.)

6) BACK VIDEO Y/C358 (NTSC) : BACK VIDEO Y/C443 (PAL)

Y/C358 (Y/C443) background video input connector. Used to perform internal key mix operations.
(Must be synchronized to GEN LOCK input.)

7) CH1 DOC IN

CH 1 DOC input connector.

8) CH2 DOC IN

CH2 DOC input connector.

9) GEN LOCK

Black burst reference signal input connector. Used to perform system genlock. (Normally loopthrough. Non-loopthrough configuration requires 75Ω input termination)

10) OUTPUT COMPOSITE 1

CH 1 composite process output connector. (When the unit is in bypass mode, the CH 1 or CH 2 input composite signal is passed directly to this output without unit processing.)

11) OUTPUT COMPOSITE 2

CH 2 composite process output. (When in bypass mode, no output signal will be present.)

12) OUTPUT Y/C358 (NTSC) : OUTPUT Y/C443 (PAL)

Y/C358 (Y/C443) process output. (When in bypass mode, the input CH 1 Y/C 358 (Y/C443) signal will be passed directly to this output without processing.)

13) ADV SYNC 1

Advanced sync output for CH1 input.

14) ADV SYNC 2

Advanced sync output for CH2 input.

15) KEY OUT

Key signal output.

16) TO OPERATION CH1

CH1 control signal connector. Connects by cable to the TO CONT CH1 connector of the operation unit.

17) TO OPERATION CH2

Spare connector at present

18) SPARE

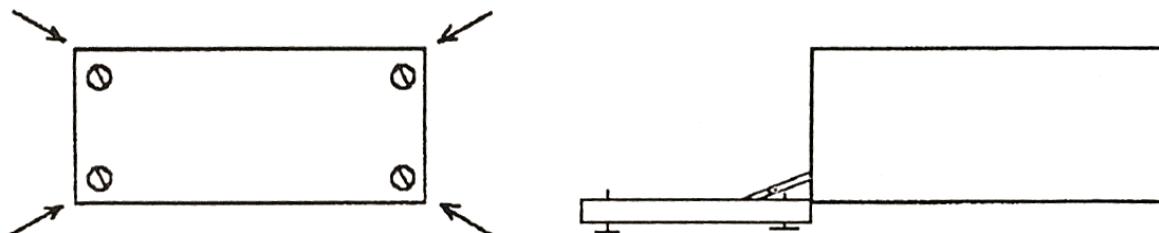
Blank connector punch throughs. Filled with rubber plugs.

SECTION 3. ADJUSTMENTS

Some adjustment of the main unit pc boards may be necessary to properly integrate your new MF3000 or MF-3000P with your existing system. Select the adjustments relevant to your system needs.

3-1. PC Board Access and Positioning

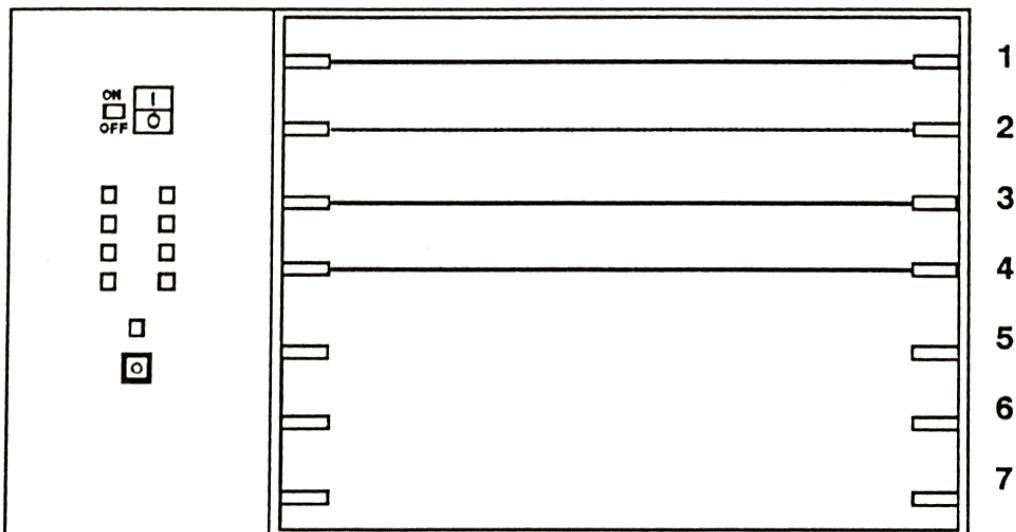
The internal PC boards (cards) of the main unit are easily accessed by removing the four screws securing the front panel and opening it as shown below.



CAUTION

Always open the front panel completely prior to accessing the cards for maintenance or adjustment purposes.

Cards are positioned in the main unit card cage as shown below:



Card 1: Input processor card (CH1)

Card 2: Input processor card (CH2) [MF-1000TU/1000PTU option. Slot is empty if this option is not chosen.]

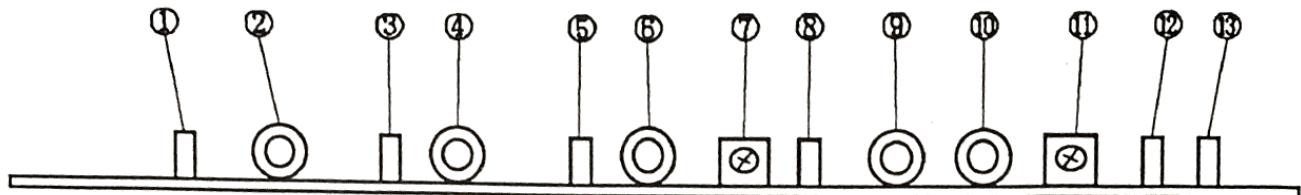
Card 3: Output processor card

Card 4: 3D effect card

Card slots 5, 6 and 7: Not used at present (Designated for future options).

3-2. PC BOARDS (Cards)

3-2-1. Card 1 - Input Processor (CH1)



1) VIDEO LEVEL VARIABLE/UNITY

Allows adjustment of the CH1 process video level (2) when set to VARIABLE (up). When set to UNITY (down), process video level is fixed.

2) VIDEO LEVEL

Used to adjust CH1 process video signal level.

3) CHROMA LEVEL VARIABLE/UNITY

Allows adjustment of the CH1 chroma level (4) when set to VARIABLE (up). When set to UNITY (down), chroma level is fixed.

4) CHROMA LEVEL

Used to adjust CH1 process chroma signal level.

5) SETUP LEVEL (NTSC) [BLACK LEVEL (PAL)] VARIABLE/UNITY

Allows adjustment of the CH1 setup [or black] level (6) when set to VARIABLE (up). When set to UNITY (down), setup is set to the reference level.

6) SETUP LEVEL (NTSC) [BLACK LEVEL (PAL)]

Adjusts the CH1 process setup [or black] level.

7) Y/C DELAY

Used to adjust CH1 process Y/C phase.

8) Y 1H DLY ON/OFF CH1

Normally set to OFF (no delay). Set to ON (a 1H delay is added to the process Y signal) if C signal is delayed 1H in reference to Y signal.

9) VIDEO PHASE

Used to adjust the process video phase of the CH1 input.

10) TINT

Used to adjust CH1 process chroma phase.

11) DOC SENS

Used to adjust the level of drop-out detection sensitivity.

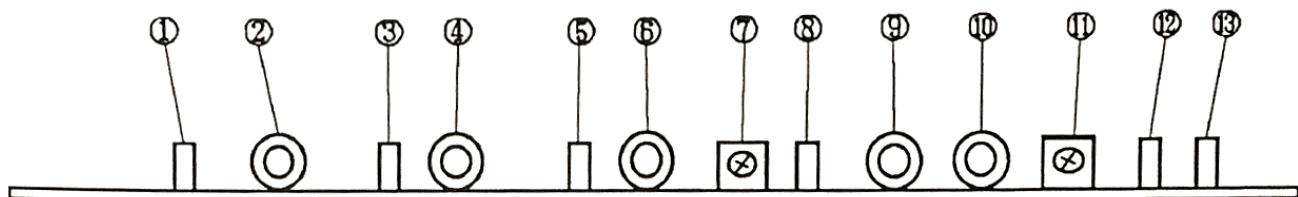
12) DOC ON/OFF

Used to turn drop-out compensation ON (up) and OFF (down).

13) COMPOSITE / Y/C358 [Y/C443]

Selects either the composite (up) or Y/C358 [Y/C443] input (down) signal as the CH1 process video input.

3-2-2. Card 2 - Input Processor (CH2) -
(MF1000TU/1000PTU Option. Not installed in basic configuration)



1) VIDEO LEVEL VARIABLE/UNITY

Allows adjustment of the CH2 process video level (2) when set to VARIABLE (up). When set to UNITY (down), process video level is fixed.

2) VIDEO LEVEL

Used to adjust CH2 process video signal level.

3) CHROMA LEVEL VARIABLE/UNITY

Allows adjustment of the CH2 chroma level (4) when set to VARIABLE (up). When set to UNITY (down), chroma level is fixed.

4) CHROMA LEVEL

Used to adjust the CH2 process chroma signal level.

5) SETUP LEVEL (NTSC) [BLACK LEVEL (PAL)] VARIABLE/UNITY

Allows adjustment of the CH2 setup [or black] level (6) when set to VARIABLE (up). When set to UNITY (down), setup is set to the reference level.

6) SETUP LEVEL (NTSC) [BLACK LEVEL (PAL)]

Used to adjust CH2 process setup [or black] level.

7) Y/C DELAY

Used to adjust CH2 process Y/C phase.

8) Y 1H DLY ON/OFF CH2

Normally set to OFF (no delay). Set to ON (a 1H delay is added to the process Y signal) if C signal is delayed 1H in reference to Y signal..

9) VIDEO PHASE

Used to adjust the process video phase of the CH2 input.

10) TINT

Used to adjust CH2 process chroma phase.

11) DOC SENS

Used to adjust the level of drop-out detection sensitivity.

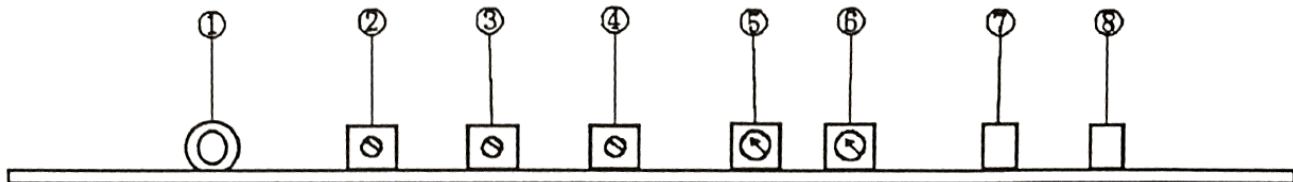
12) DOC ON/OFF

Used to turn drop-out compensation ON (up) and OFF (down).

13) COMPOSITE / Y/C358 [Y/C443]

Selects either the composite (up) or Y/C358 [Y/C443] input (down) signal as the CH2 process video input.

3-2-3. Card 3 - Output Processor



1) CHROMA PHASE

Used to adjust chroma phase.

2) BACK PORCH

Used to adjust video phase of the video output sync signal (border, matte).

3) H PHASE

Used to adjust system output video H phase in comparison to the genlock reference input.

4) SC PHASE

Used to adjust system output video SC phase in comparison to the genlock reference input.

5) KEY PHASE

Used to adjust key signal phase.

6) KEY WIDTH

Used to adjust key signal width.

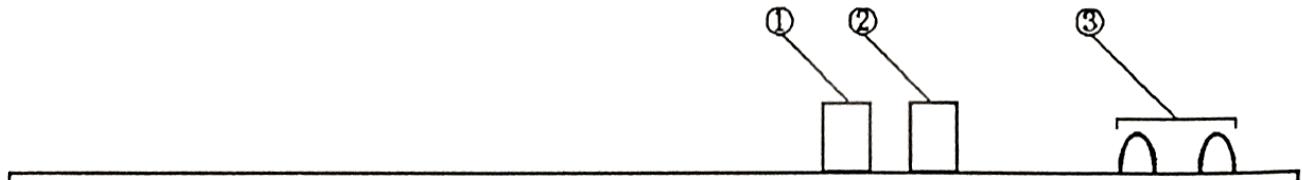
7) INTMIX/EXTMIX

Set to INTMIX (up) when images containing effects produced by this system are to be internally mixed with background video. Set to EXTMIX (down) when the produced images will be mixed in an external unit.

8) B/W/COLOR

Set to B/W (up), when black-and-white video signals are input, to turn off the video output burst signal. Set to COLOR (down) when color signals are input.

3-2-4. Card 4 - 3D Effect



1) CPU RST

Resets the control CPU when pressed. (Used primarily for diagnostic purposes.)

2) BYPASS

Enables momentary bypass of the 3D effect card when pressed. (Used primarily for diagnostic purposes.)

3) STATUS

Green lamp: Lights when gate array and CPU are operating correctly.

Red lamp: Lights upon detection of a CPU fault.

Green & red lamps: Both light if a gate array fault is detected. (Normally, both lamps will light briefly immediately after power is switched ON.)

SECTION 4. CONNECTIONS

4-1. Connection Set Up Information

- (1) Two video inputs, A and B, can be used. The signals should be supplied to the CH1 and CH2 inputs on the back of the main unit and must be synchronized.
- (2) When only one input is used, the signal should be supplied to the CH1 input, not CH2.
- (3) When inputting black-and-white video signals, set the COLOR/MONO switch on card 3 in the main unit to MONO.
- (4) The H and SC phases of the MF-3000's video output must be adjusted to match those of the background video input when mixing background video in the internal mix (INT MIX ON) key mode

However, if phase adjustment between the video output signals of the MF-3000 and those of another system is necessary in the INT MIX mode, this adjustment must be made using the output signals of the other system.

- (5) Use the H PHASE and SC PHASE controls to adjust the phase of external switcher unit input signals when operating in the external mix (INT MIX OFF) mode.
- (6) All input video signals should be time base corrected (passed through a TBC) and free from time base error. They should also be synched to the genlock reference for the background video input.

4-2. Connection Configurations

Refer to Figs. 4-2-1 to 4-2-6 and proceed with connection.

Fig. 4-2-1. Operational Checkout Only

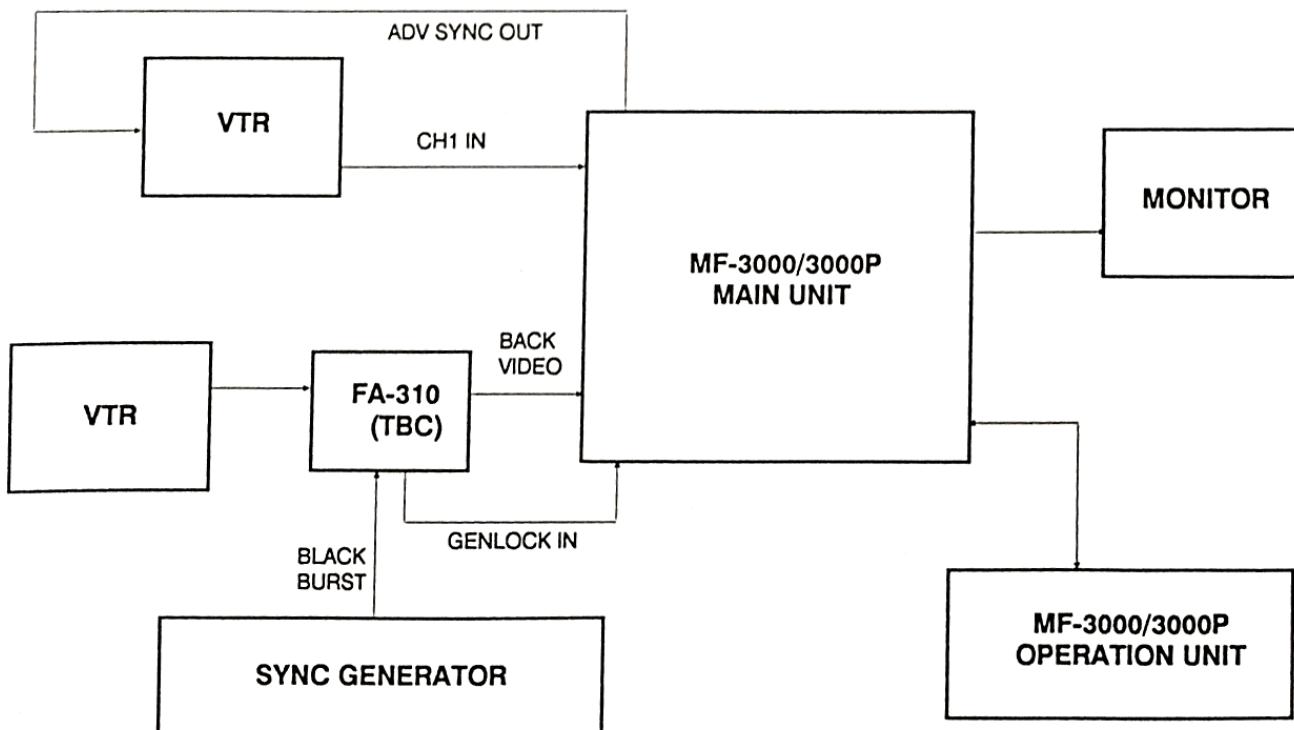


FIG. 4-2-2. SINGLE TBC / COMPOSITE INPUT / INT MIX MODE

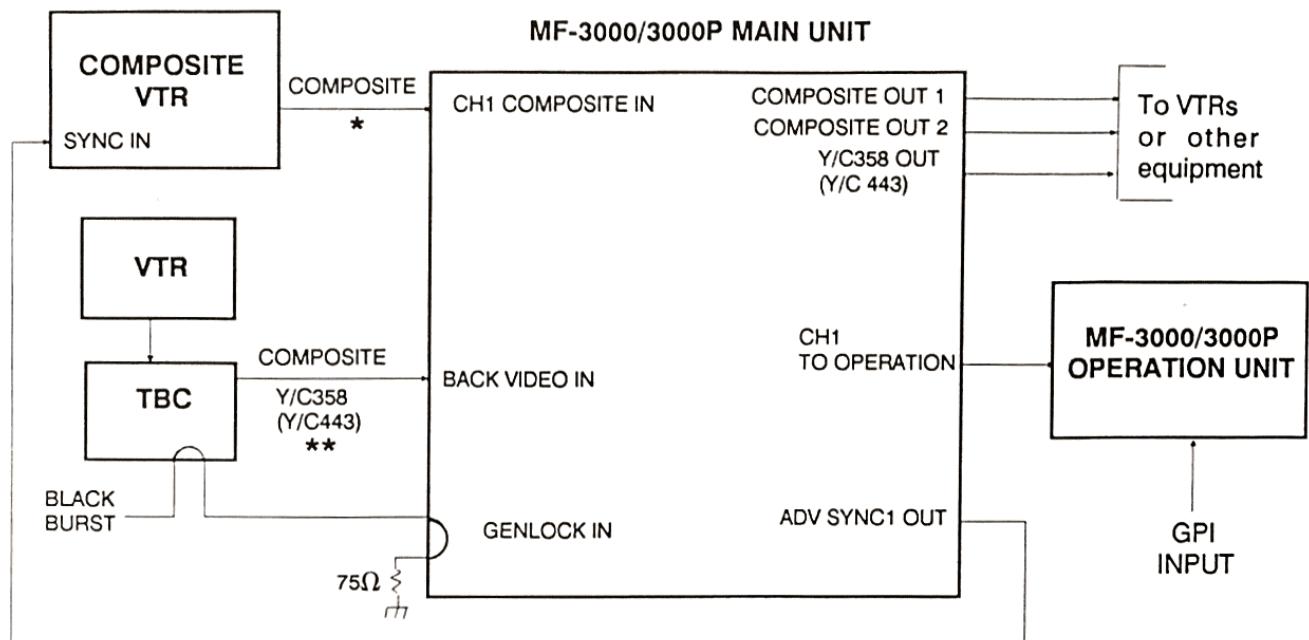
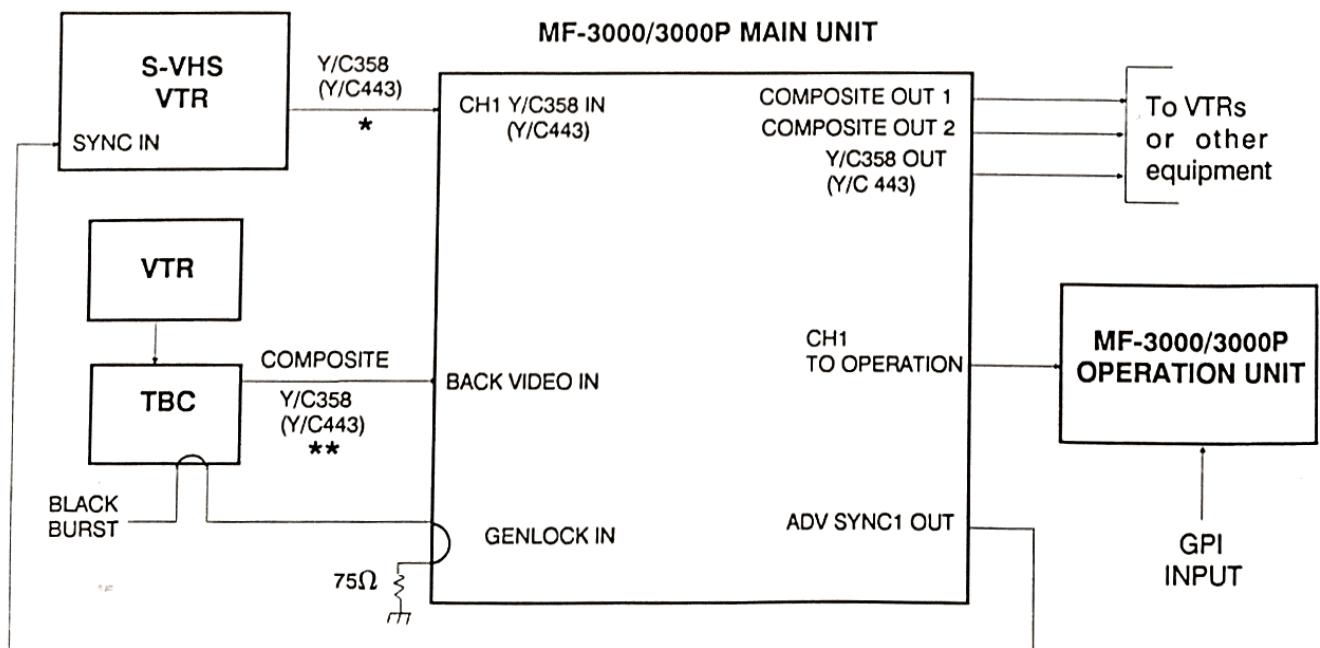


Fig. 4-2-3. SINGLE TBC / Y/C358 (Y/C443) INPUT / INT MIX MODE



* Regardless of whether composite or Y/C358 (Y/C443) video signals are supplied (CH1, CH2), they are output to the COMPOSITE OUT1, OUT2 and Y/C358 (Y/C443) connectors.

** Select your background video input according to which output is required as the background signal. If a composite input signal is used for BACKVIDEO, it will be output to COMPOSITE OUT1 and OUT2. If a Y/C358 (Y/C443) input signal is used, it will be output to Y/C358 (Y/C443) OUT.

Fig. 4-2-4. DUAL TBC/COMPOSITE INPUT/INT MIX MODE

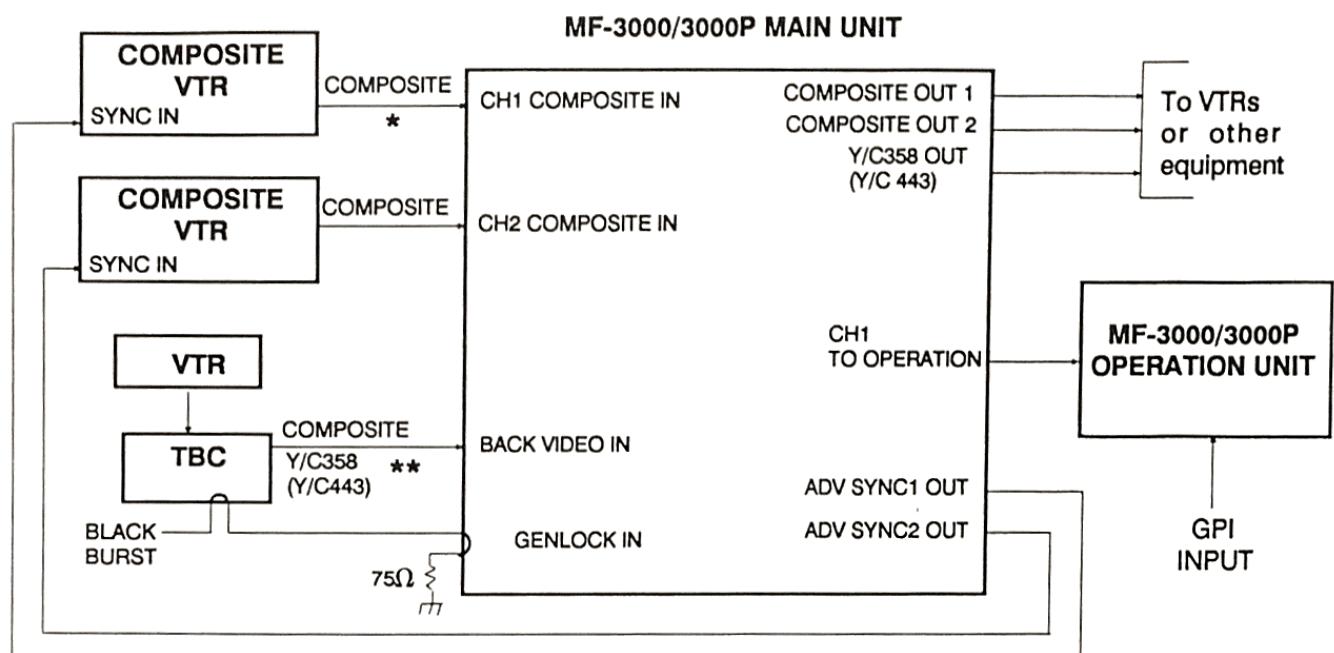
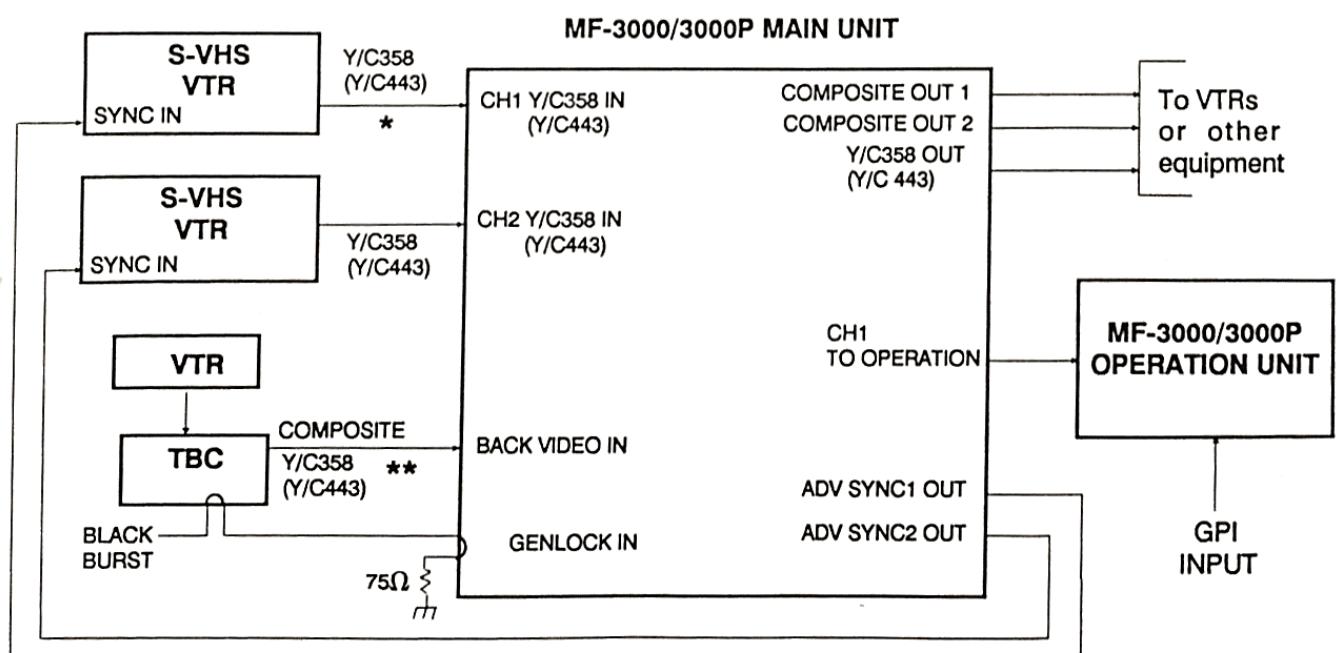


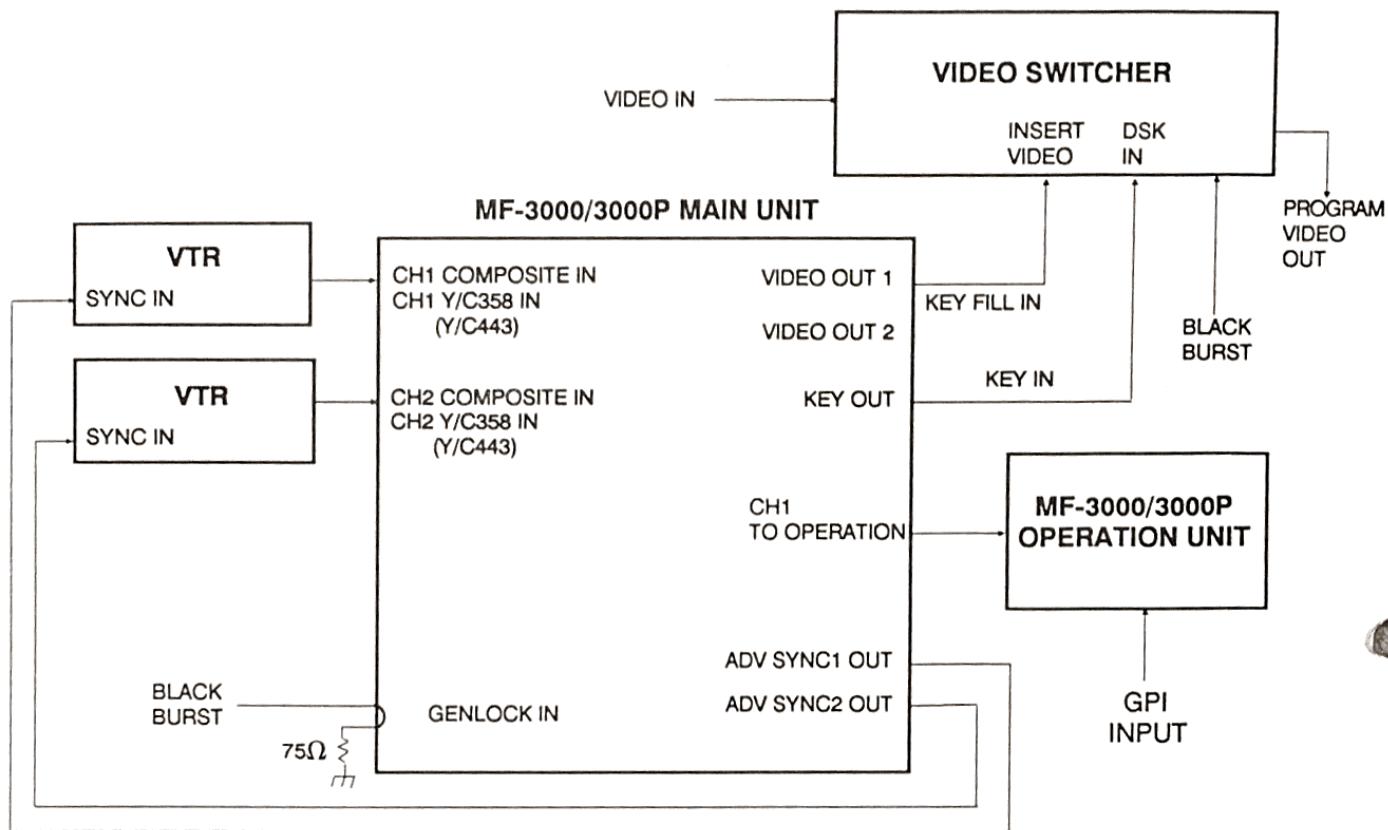
Fig. 4-2-5. DUAL TBC / Y/C358 (Y/C443) INPUT/INT MIX MODE



* Regardless of whether composite or Y/C358 (Y/C443) video signals are supplied (CH1, CH2), they are output to the COMPOSITE OUT1, OUT2 and Y/C358 (Y/C443) connectors.

** Select your background video input according to which output is required as the background signal. If a composite input signal is used for BACKVIDEO, it will be output to COMPOSITE OUT1 and OUT2. If a Y/C358 (Y/C443) input signal is used, it will be output to Y/C358 (Y/C443) OUT.

Fig. 4-2-6. DUAL TBC/EXT MIX mode (with external switcher connected)



Mixing performed by external equipment when MF-1000TU/1000PTU is connected

4-3. Troubleshooting

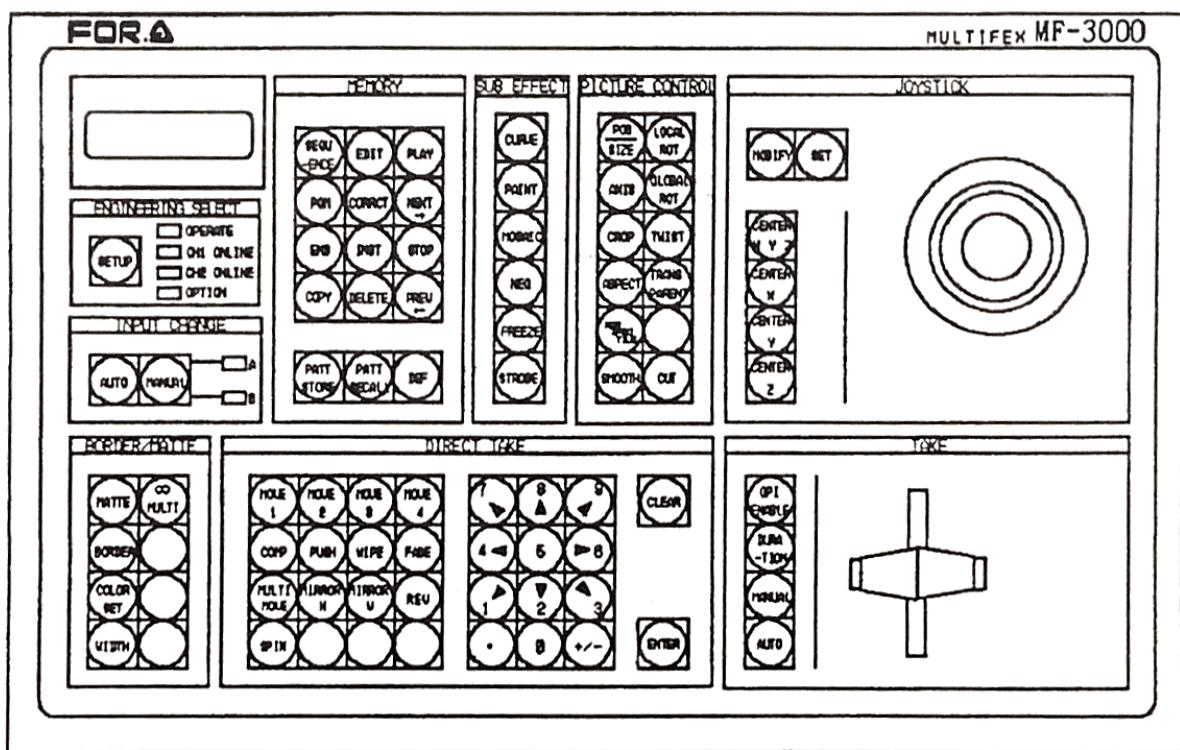
If your MF-3000/3000P is not operating correctly after completing the previous connections and powering on the unit (see Sec. 5-1; Power On), proceed with the simple checks described below before conducting maintenance or servicing.

NO.	FAULT	PROBABLE CAUSE	REMEDY
1	No power	a) Blown fuse	Replace fuse.
		b) Disconnected AC cord	Properly reconnect AC cord
2	No effects	a) No connection between main unit and operation unit.	Connect the units as indicated in the connection illustrations.
		b) Cable connecting main and operation units is damaged or severed.	Replace cable.
		c) Errors in battery backed up memory data.	Set jumper JP4 on the CPU card inside the operation unit to the BATT ON position

NO.	FAULT	PROBABLE CAUSE	REMEDY
2	No effects	d) BYPASS/OPERATE switch on front panel of the main unit is in BYPASS (indicator off).	Set switch to OPERATE (Indicator lights).
		e) No power ON indication/operation unit	Turn operation unit ON.
		f) Noise interference from power cord	Connect ground terminals on main and operation units to ground.
3	No output image	a) A/B selector switch is set to a channel without an input signal.	Connect an input signal or switch to a channel with an input.
		b) Composite / Y/C switch set to wrong position	Reset switch to correct position for your system.
		c) Image size set to zero	Press [DEF] in the MEMORY section of the operation panel.
		d) Fade-out mode established	
4	No image synchronization	a) No BACK VIDEO signal supplied	Either set INT/MIX switch to EXT/MIX or supply a BACK VIDEO signal. If you supply BACK VIDEO, remember that composite and Y/C signals cannot be used for both BACK VIDEO and output signals.
		b) H phase improperly adjusted	Readjust using the H PHASE control.
		c) Improper input signal for television use	Supply proper input signal.
		d) No genlock signal	Supply genlock reference signal and terminate with 75Ω.

SECTION 5. OPERATION

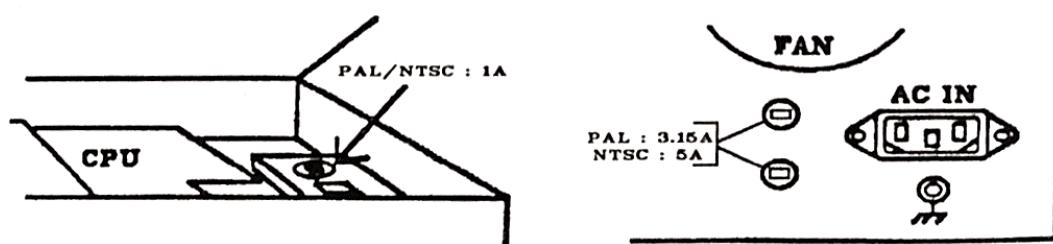
The following section describes and explains the operation of each of the indicators and function keys on the operation panel.



5-1. Power On

After configuring your MF-3000/3000P, and prior to turning power "ON", check the following points:

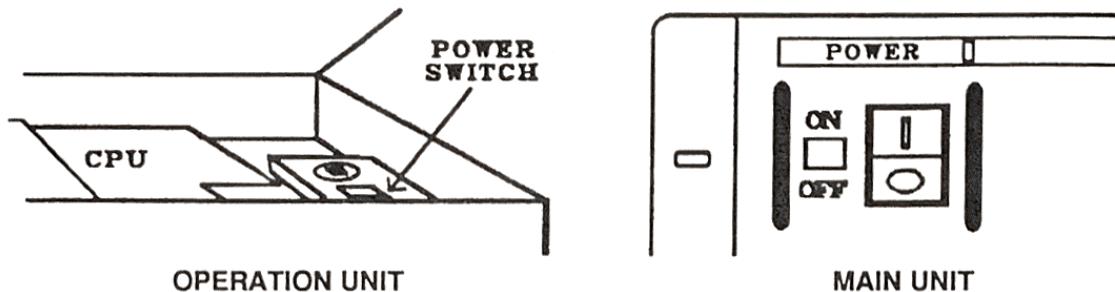
- Are all connections correct and secure?
- Are all fuses installed and of the proper rating?



(All fuses are slow blow unless otherwise indicated.)

- Does the voltage specification of your unit match that of your power source?

Once the preceding points have been checked and you are certain the MF-3000/3000P is ready for operation, set the power switch on the main and operation units to "ON". (ON/OFF indicators near each switch should light green to indicate power is "ON").



** CAUTION**

DO NOT touch or move the joystick when powering on the unit or improper response could result! For example, joystick center position could be misaligned or image positioning may not hold.

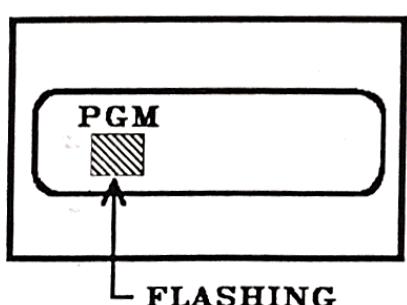
5-2. Operation Panel Key Indications

The function keys (switches) of the MF-3000/3000P operation panel will either light or not light to indicate the following:

- OFF:** Key is not lit and is not active. Not available for next operation selection.
- ORANGE:** Key is available for next operation selection, but is currently inactive.
- GREEN:** Currently selected and active.

When operating the unit, always be aware of the key status. Operations are performed in a series of steps and often another key or keys must first be selected to change or perform the effect you want.

5-3. LCD Display/Prompt



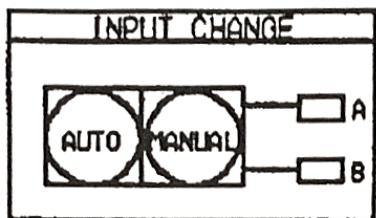
The LCD display window shows the operator unit status and/or effect parameter values, depending on the function/effect selected on the operation panel. In some cases, such as programming key frames or sequences, it will display an operator prompt. For example, in the figure shown, the unit is asking for the program number to be stored or performed; i.e., "Which program do you want?"

The display consists of two rows of up to 16 characters each and the flashing character square indicates the parameter that will be changed (if it is set with the numeric keypad).

The LCD display examples shown throughout this manual for information purposes will differ slightly from what the operator will see on the actual display since they are drawn in a simplified form.

5-4. Input Change

This section chooses either CH A or CH B video as the input signal.

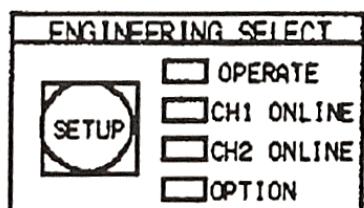


[MANUAL] is an alternate-type switch; one press selects CH A, the next CH B, etc., as the video signal input to the MF-3000/3000P.

[AUTO], however, is an ON/OFF-type. When "ON", the unit will automatically switch the video input to the unit from CH A to CH B, and vice versa, every time the monitor image moves off screen or "changes sides" (as when [SPIN] in the DIRECT TAKE section is applied).

A/B Indicators: Lit indicator will correspond to the channel currently selected as the input video signal.

5-5. Engineering Select



The ENGINEERING SELECT section is used to verify operational status and to change the setup of two internal parameters; INTMIX or EXTMIX (INTMIX off) mode and joystick response speed.

Only two of the four status indicators in this section are operative on the current model.

OPERATE: Lights whenever the main unit is powered "ON" and operationally active.

CH 1 ON LINE: Lights to indicate the main and operation units are connected, via the accessory coaxial cable, and both are operationally active.

The other two, CH 2 ON LINE and OPTION, are non-functional at this time and are reserved for use with future system upgrades.

[SETUP] allows the operator to access and change, according to the LCD display, the parameter values/settings of certain functions.

Even though several differently numbered functions will appear on the display, only two can be operationally set or changed on the current model.

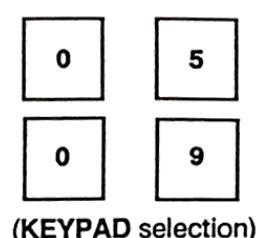
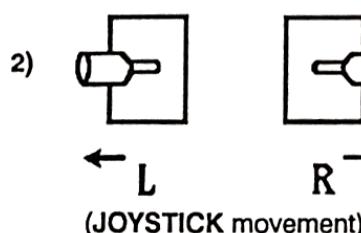
05: INTMIX ON/OFF

09: JOYSTICK speed

If any of the other functions are selected, and changes made using the operation panel keys, the changes will have no effect on unit operations, even though the LCD display shows that parameter changes have been made.

To use [SETUP] to change either 05 or 09.....

Press [SETUP] and select the desired function using either:



Once 05 or 09 appears on the LCD display:

For 05 INTMIX ON/OFF



OR: Select [0] (OFF) or [1] (ON) on the numeric keypad and press [ENTER].

For 09 JOYSTICK speed



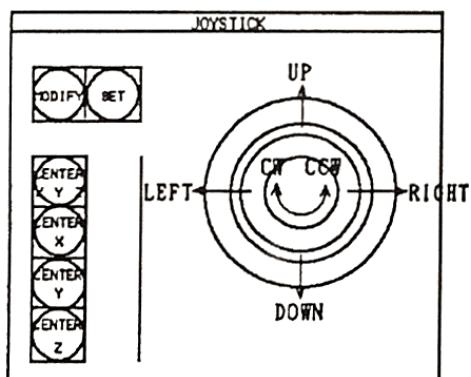
OR: Select a number [0] ~ [9]* on the numeric keypad and press [ENTER].

*NOTE: Selecting [0] = 0 speed and disables joystick operation.

Then, press [SET] in the JOYSTICK section and [END] in the MEMORY section to set the new parameters.

Release [SETUP] (switch will extinguish) and the parameter change is complete.

5-6. JOYSTICK



This section contains two groups of function keys; [MODIFY] & [SET] for parameter changes and four AUTO CENTERING keys for image positioning, in addition to the operational joystick.

The joystick operates on three axes and serves two different functions; image positioning/sizing and changing function/effect parameters.

To use for positioning/sizing:

- 1) Press [POS/SIZE] in the PICTURE CONTROL section.
- 2) To change the positioning of the image, observe the monitor and move the joystick in the desired direction.

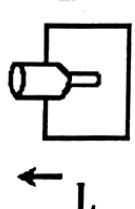
3) To change size; CW (clockwise) increases CCW (counter clockwise) decreases.



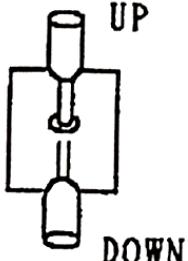
To use for changing function/effect parameters:

The joystick has three main movement patterns which change the effects parameters shown in the LCD display

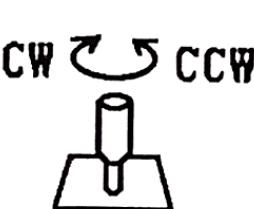
1.) Left or right*



2.) Up or down*



3.) Twist CW or CCW*

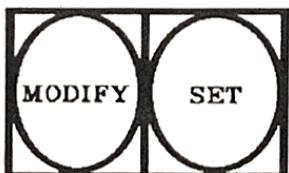


- * Moving the joystick at angles to either the up/down or left/right parameter change movements will result in both the parameter affected by left/right movement and the one affected by up/down movement being changed simultaneously in most cases. In some cases, however, moving the joystick will not change parameters.

Which parameters the joystick actually changes will depend on which function keys are selected on the operation panel **after [MODIFY]** in this section is selected.

Note: Either the joystick or numerical keypad in the DIRECT TAKE section can normally be used to change parameter settings. However, some effects can only be entered (or more precisely set) using the keypad, while other effects can be more effectively entered using the joystick.

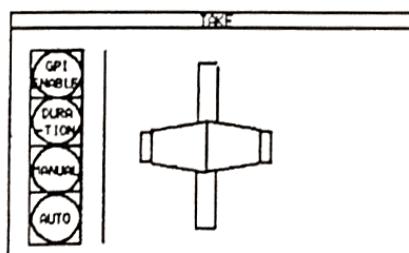
As to the function keys —



[MODIFY] must be selected prior to selecting the function during certain operations to allow parameter settings to be changed.

[SET] must be selected after parameter changes are complete during the performance of certain operations. However, it is not always necessary to "set" parameter changes with this key. Operations requiring the use of **[SET]** will be noted throughout this manual.

5-7. TAKE



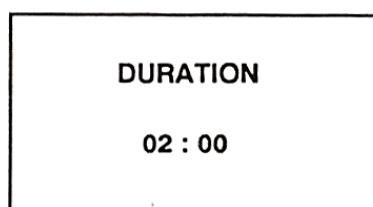
All of the function keys in this section, and the fader lever, are related to effects/program performance, except **[GPI ENABLE]**.

FADER LEVER: The fader lever is used to manually perform effects and/or programs (and program/sequence functions) chosen in the DIRECT TAKE or MEMORY sections.

When a program or effect is performed manually with the fader lever, one direction (down to up) will perform the effect normally, but the other (up to down) will perform it in reverse. If the **[REV]** (reverse) key in the DIRECT TAKE section is active, the opposite will occur; down to up will produce a reverse performance, up to down a normal one.

In addition, the **[MANUAL]** key in this section must always be active and either a DIRECT TAKE or MEMORY function selected for the fader lever to be operationally active.

[DURATION] is used to change the time interval during which effects and/or programs are performed. When selected, the LCD display will change to a display similar to the one shown to the right. The last digit of the display will be flashing and 02:00 is the factory set duration time.



The first two digits shown in the display equal the total performance time in seconds, while the last two equal the number of frames performed per second. Total performance time ranges from 0 ~ 59 seconds. Frame count ranges from 0 ~ 29 for NTSC / 0 ~ 24 for PAL.

The numerical keypad is used to set duration parameters. As entries are selected, the choices will move across the display from left to right; hence, if a duration time of 36:15 is desired, select [3] \Rightarrow [6] \Rightarrow [1] \Rightarrow [5] on the numeric keypad, then select [ENTER] in the DIRECT TAKE section.

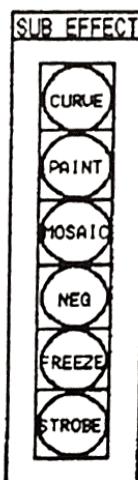
[MANUAL] operationally enables the fader lever, but only if a DIRECT TAKE or MEMORY function has first been selected. Otherwise, it will remain operationally inactive.

[AUTO] will initiate immediate and automatic performance of the effect/program selected in either the DIRECT TAKE or MEMORY section over the set duration time. As with the **[MANUAL]** key, a DIRECT TAKE or MEMORY function must always be selected prior to selecting **[AUTO]** take; otherwise, the function will remain inactive.

In addition, an effect/program performed using **[AUTO]** take will only occur in the normal direction (unlike a manual take using the fader lever where direction depends on lever movement). To perform an **[AUTO]** take in reverse, **[REVERSE]** in the DIRECT TAKE section must be active.

[GPI ENABLE] is not directly related to effects/program performance, but enables (ON) and disables (OFF) external control of the MF-3000/3000P by other equipment.

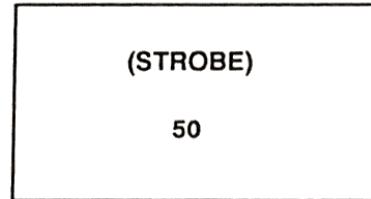
5-8. SUB EFFECTS



All of the functions in the SUB EFFECTS section can either be combined with other effects, or used independently, except **[STROBE]**.

[STROBE] can only be activated if either **[NEG]** or **[FREEZE]** is first selected. The selection of **[STROBE]** changes movement within the selected image from smooth and continuous to broken with a set pause between moves. Once **[MODIFY]** and **[STROBE]** are selected, a display similar to the following will appear:

Where: Parameter range = 0 ~ 100
0 = No strobe (normal image)
100 = Fastest strobe rate



To change the shown parameter:

JOYSTICK: Increase strobe = CW



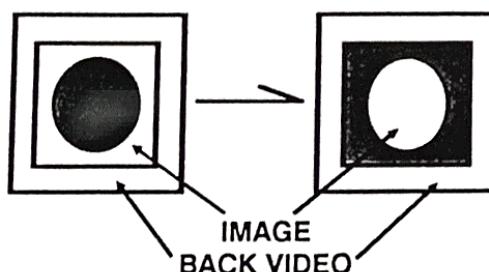
CCW = Decrease strobe

Until desired strobe parameter shows on display.

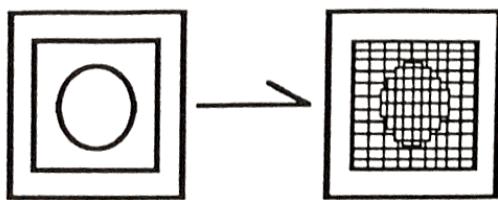
KEYPAD: Select **[MODIFY]**, \Rightarrow Select a number, 0 ~ 100, \Rightarrow Select **[ENTER]** in the DIRECT TAKE section
then **[STROBE]** on the numeric keypad

[FREEZE] is a simple ON/OFF type switch (one push ON, next OFF). When ON (green), movement within the input image is frozen. In the case of **[FREEZE]**, no display will appear since no parameters can be changed.

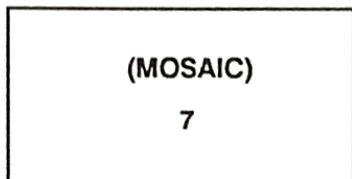
[NEG], like **[FREEZE]**, is also a simple ON/OFF type switch. When ON (green), the image will change to a reverse monochrome of the original (i.e., light colored areas will become dark and dark areas light). No display will appear since no parameters can be changed.



[MOSAIC] gives a "digitized" appearance to the image, making it appear to be composed of moving blocks. The size of the "blocks" depends on the degree of the mosaic parameter chosen.



Once [MODIFY] is selected and [MOSAIC] is chosen, a display similar to the following will appear:



Where: Parameter range = 0 ~ 7
7 = Max. mosaic
0 = NO effect

To change parameters:

JOYSTICK: Increase strobe = CW

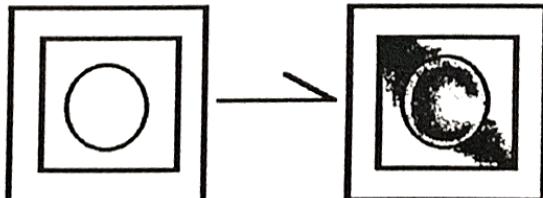


CCW = Decrease strobe

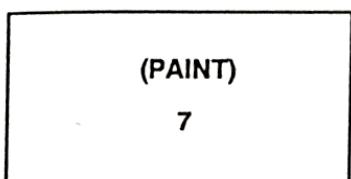
Until desired strobe parameter shows on display.

KEYPAD: Select [MODIFY], \Rightarrow Select a number, 0~7, \Rightarrow Select [ENTER] in the DIRECT TAKE section
then [MOSAIC] on the numeric keypad

[PAINT] causes the image to look like a moving painting due to solarization of the Y level. Similar to [MOSAIC], the degree of the effect depends on the level of the parameter chosen.



Once [MODIFY] is selected and [PAINT] is chosen, a display similar to the following will appear:

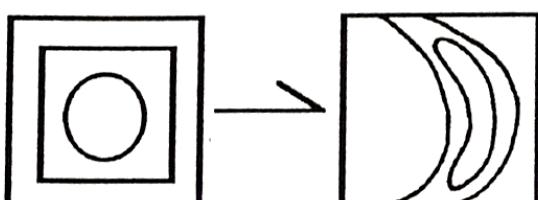


Where: Parameter range = 0 ~ 7
7 = Max. paint
0 = NO effect

To change the shown parameter:

Follow the same joystick and keypad procedures as for [MOSAIC].

[CURVE] distorts the image and makes it appear to be bent along a curved line. In the case of [CURVE], two parameters will appear in the display window and each one represents two main curvature directions, depending on whether a + or - parameter is chosen.

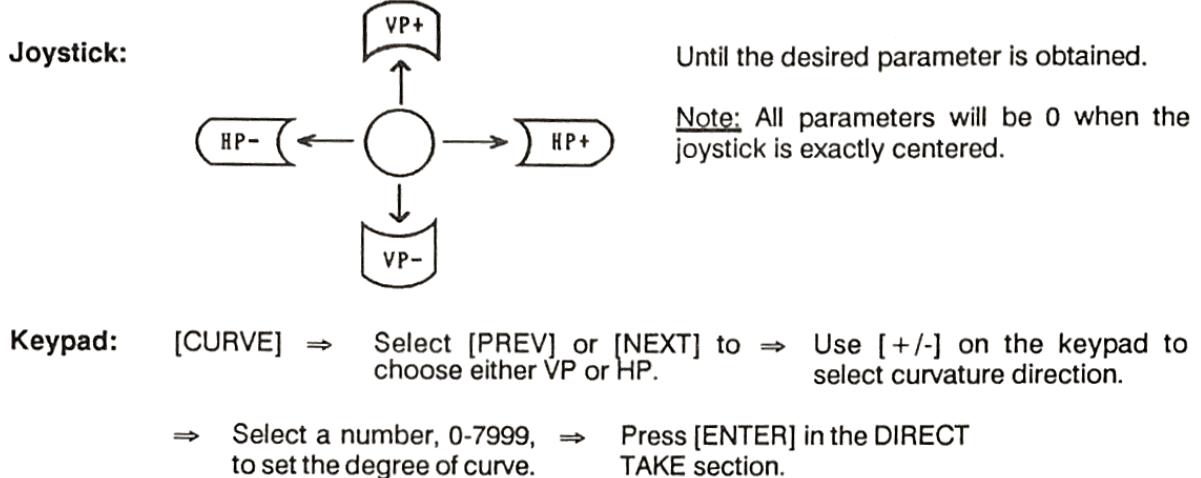


Once [MODIFY] is selected and [CURVE] chosen, a display similar to the following will appear:

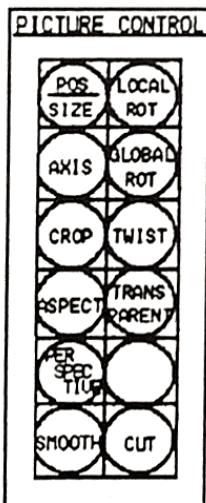
(HP)	(VP)
+0000	-1000

Where: Parameter ranges = -7999 ~ 0 or 0 ~ +7999
 0 = No effect
 +/- 7999 = max. curve (any direction)

To change the shown parameters:



5-9. Picture Control

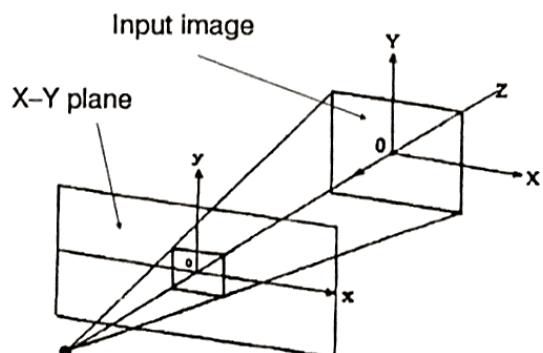


The picture control section contains functions related to 3-dimensional space, keyframe-to-keyframe movement and basic effects.

In this section [POS/SIZE], [AXIS], [LOCAL ROT] and [GLOBAL ROT] all directly affect spacial relationships during effects performance. Therefore, the operator must have a firm grasp of exactly how the input image, viewpoint and output image positions are related to make the best use of the 2-D and 3-D effects provided by the MF-3000/MF-3000P.

The term "input image" denotes the image input to the MF-3000/ MF-3000P before effects have been applied. Imagine the center of this image as the "home position" of the 3-dimensional space the MF-3000/3000P operates in and that the "home" position's center extends along the z axis in a viewpoint line as shown to the right.

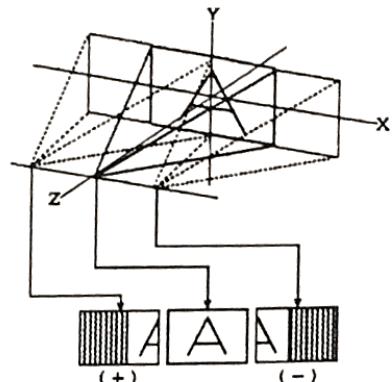
Existing somewhere between the input image and the focus of the viewpoint line is a projected X-Y "plane". The image projected onto this plane will correspond to the output image viewed on the operators monitor. Effects added to images on the X-Y "plane" will produce 2-dimensional effects, but effects added to images along all three axes (x, y and z) are added in 3-dimensional space and produce "3-D effects".



Viewpoint to output image relationship

[POS/SIZE] in this section actually performs two functions; image positioning and zoom (reduction/enlargement).

In both cases, the image is "moved" along a given spacial axis. Even though the results may look the same when observed on the monitor, [POS/SIZE] should not be confused with [AXIS], which changes the relationship between the image and the 3-D axes. To clarify further, [POS/SIZE] will move the image as shown in the example at right during horizontal positioning.



Positioning movement relative to axes

Once [POS/SIZE] is selected a display similar to the following will appear:

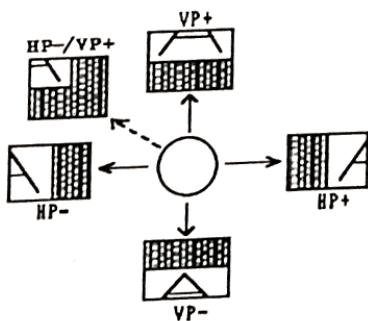
(SZ)	(HP)	(VP)
+ 1000	-1000	+ 0500

Where: Parameter ranges = -7999 ~ 0 or + 7999 ~ 0
 Default for all parameters = 0 (HP, VP) / 1000 (SZ)
 (HP) = horizontal image movement along the X axis.
 (VP) = Vertical movement along the Y axis.
 (SZ) = Movement along the Z axis which makes the image appear to change size.

To change the shown parameters:

POSITIONING (HP & VP)

Joystick:



Until the desired parameters are obtained.

Note: All parameters will be 0 when the joystick is exactly centered and not twisted CW or CCW.

Note 2: "Angle" positioning results from a combination of movements along two or three axes (shown by dotted arrow).

Keypad: [POS/SIZE] \Rightarrow Select [PREV] or [NEXT] to choose either VP or HP. \Rightarrow Use [+/-] on the keypad to select direction.

\Rightarrow Select a number, 0-7999, \Rightarrow Press [ENTER] in the DIRECT TAKE section.
 to set the degree of movement.

SIZING (SZ)

Joystick:

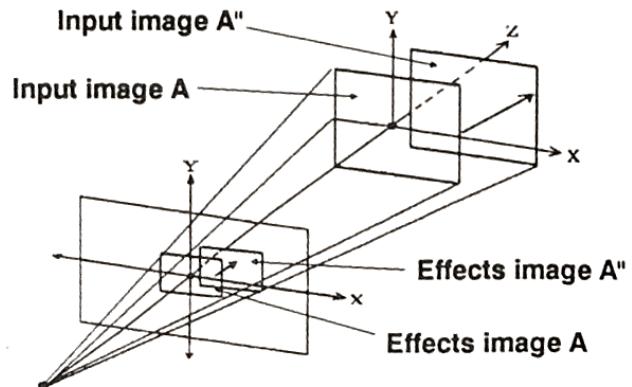


Until the desired parameter is obtained.

Keypad: [POS/SIZE] \Rightarrow Select [PREV] or [NEXT] to \Rightarrow Proceed the same as when choose either VP or HP.

Although positioning and sizing parameter changes are shown separately, all three parameters (HP, VP and SZ) can be changed in one operation. Just combine either the two joystick procedures or the two for keypad input.

[AXIS] is required to change the spacial relationship between the axes of the image and the axes of the 3-D space in which effects are performed. Even though the results may look the same when observed on the monitor, [AXIS] should not be confused with [POS/SIZE], which simply "moves" the image along a chosen axis. To clarify further, [AXIS] changes the image/3-D space relationship as shown in the example at right during repositioning.



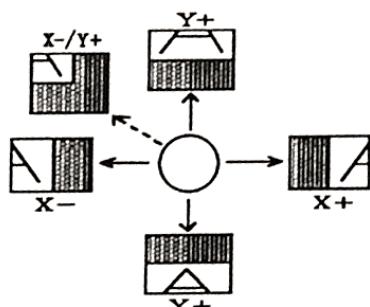
Once [AXIS] is selected a display similar to the following will appear:

(X:-)	(Y:+)	(Z:+)
1000	0000	3999

Where: Parameter ranges = -7999 ~ 0 or +7999 ~ 0
Default for all parameters = 0
(X +/-) = Changes in the X axis relationship.
(Y +/-) = Changes in the Y axis relationship.
(Z +/-) = Changes in the Z axis relationship.

To change the shown parameters:

Joystick:



Until the desired parameters are obtained.

Note: All parameters will be 0 when the joystick is exactly centered and not twisted CW or CCW.

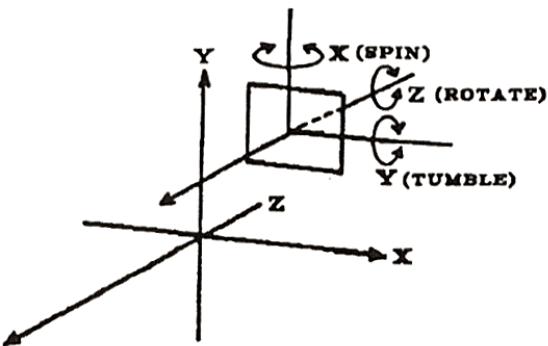
Note 2: "Angle" changes in relationship result from a combination of two or three axes (shown by dotted arrow)



Keypad: [POS/SIZE] \Rightarrow Select [PREV] or [NEXT] to \Rightarrow Use [+/-] on the keypad to choose X, Y or Z parameter.

\Rightarrow Select a number, 0-7999, \Rightarrow Press [ENTER] in the DIRECT TAKE section.
to select the degree of change in relationship.

[LOCAL ROT] is used to define the relationship between image movement and the axial coordinates of the image, unrelated to the axial coordinates of the 3-D effects space, as shown in the figure at right. A different type of motion is performed for each axis; spin for rotation around the image's X axis, tumble around the Y axis and rotation around the Z axis.



Local rotation to 3-D space relationship

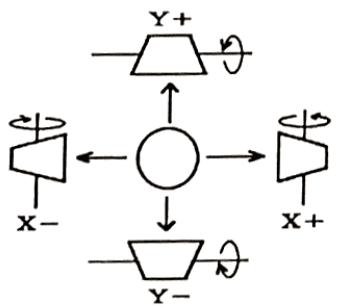
Once [LOCAL ROT] is selected a display similar to the following will appear:

(X:-)	(Y:+)	(Z:+)
7359	3320	1000
A : 1st digit		
B : Last 3 digits		

Where:
 Sub-parameter A = Number of rotations
 Sub-parameter A range = 0~7
 Sub-parameter B = Rotational angle
 Sub-parameter B range = 0~359
 Default for all parameters = 0
 +/- = Rotational direction

To change the shown parameters:

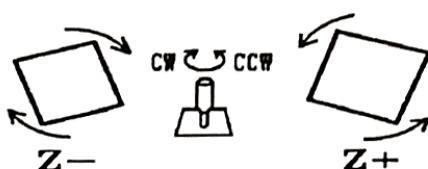
Joystick:



Until the desired parameters are obtained.

Note: All parameters will be 0 when the joystick is exactly centered and not twisted CW or CCW.

Note 2: [SET] must be selected after parameter changes are complete during programming or editing



Keypad: [LOCAL ROT] → Select [PREV] or [NEXT] to choose X, Y, Z parameter. → Use [+/-] on the keypad to select rotational direction.
 ⇒ Select a number, 0-7 and 0~359, to set the degree and amount of rotation. ⇒ Press [ENTER]* in the DIRECT TAKE section.

*Note: [SET] must be selected after parameter changes are complete during programming or editing

INHIBITING IMAGE INVERSION DURING ROTATION:

During normal operation, the input image will be automatically inverted during rotation effects as shown below in fig. 1.

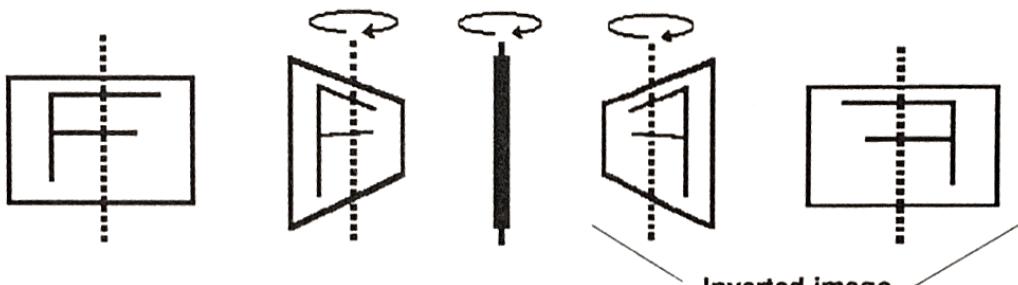


Fig. 1. Image inversion during rotation

To inhibit automatic image inversion during rotation, the steps shown in the table below (key frames shown in fig. 2) must be programmed into the MF-3000/3000P. Note both ROT and TWIST parameters are changed.

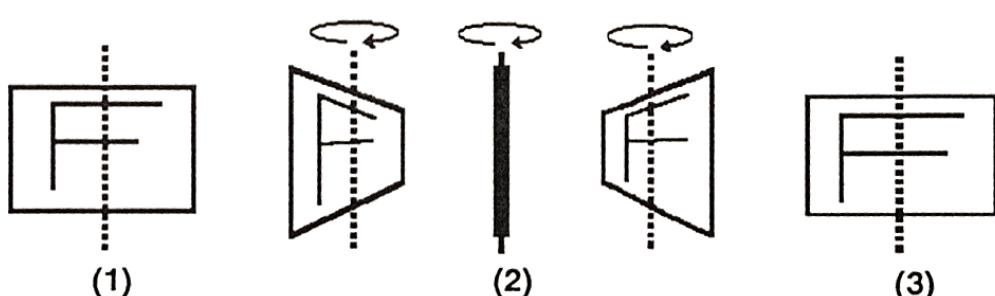


Fig. 2. Program example of inhibited image inversion

	Keyframe (1)	Keyframe (2)	Keyframe (3)
LOCAL ROT (or GLOBAL)	(X:+) (Y:+) (Z:+) 0000 0000 0000	(X:+) (Y:+) (Z:+) 0090 0000 0000	(X:+) (Y:+) (Z:+) 0180 0000 0000
TWIST	[HOR] (VERT)* +0000 0000	[HOR] (VERT)* +0500 0000	[HOR] (VERT)* +0500 0000

* () = Curvature interpolation [] = No interpolation

If two inputs (A and B) and the above program are used, then input change will be performed without image inversion when [AUTO] is selected as the INPUT CHANGE mode.

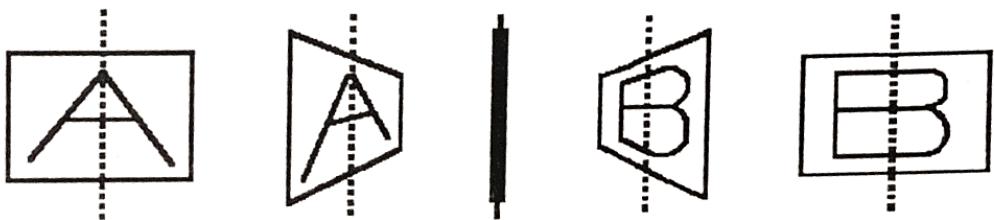
For example:

Connect two inputs.

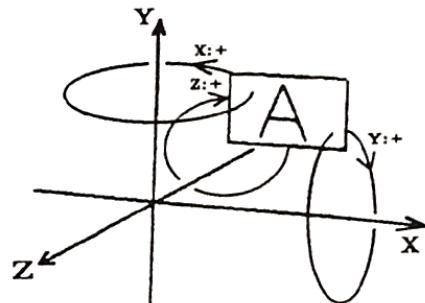


Then, set INPUT CHANGE to [AUTO].

Input change will occur as shown below, without image inversion, if the inhibit program has first been input.



[GLOBAL ROT] is used to define the relationship between image movement and the axial coordinates of the 3-D space in which effects are performed, as shown in the figure. Keep in mind that even though the LCD parameter display looks almost the same for both [LOCAL ROT] and [GLOBAL ROT] the movement relationship each affects is different.



Local rotation to 3-D space relations

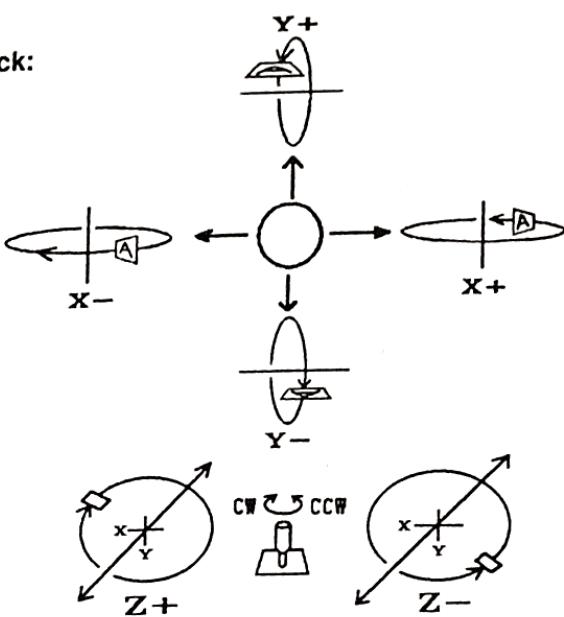
Once [GLOBAL ROT] is selected a display similar to the following will appear:

(X:-)	(Y:+)	(R:+)
7359	3320	1000
B: Last 3 digits		
A: 1st digit		

Where:
 Sub-parameter A = Number of rotations
 Sub-parameter A range = 0 ~ 7
 Sub-parameter B = Rotational angle
 Sub-parameter B range = 0 ~ 359
 Default for all parameters = 0
 +/- = Rotational direction

To change the shown parameters:

Joystick:



Until the desired parameters are obtained.

Note: All parameters will be 0 when the joystick is exactly centered and not twisted CW or CCW.

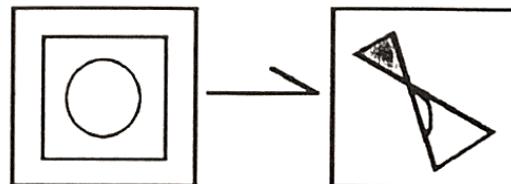
Note 2: [SET] must be selected after parameter changes are complete during programming or editing

Keypad: [GLOBAL ROT] → Select [PREV] or [NEXT] to choose X, Y, Z parameter. → Use [+/-] on the keypad to select rotational direction.

⇒ Select a number, 0-7 and → Press [ENTER]* in the 0~359, to set the degree DIRECT TAKE section. and amount of rotation.

***Note:** [SET] must be selected after parameter changes are complete during programming or editing

[TWIST] is one of the basic effects offered in this section and it makes the input image appear to "twist" from a normal to an inverted image.



Once [TWIST] is selected a display similar to the following will appear:

(HOR)	(VER)
+0000	-1000

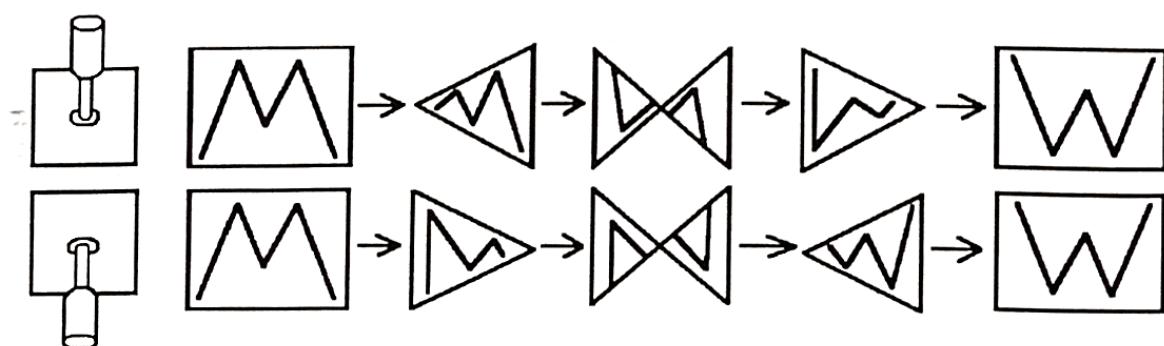
Where: Parameter ranges = -7999~0 or +7999 ~ 0
Default for all parameters = 0
(+/-) = Increases or decreases the degree of twist.

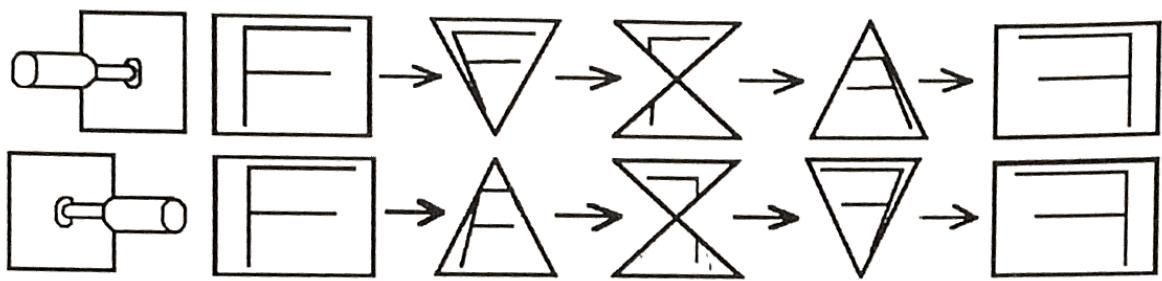
To change the shown parameters:

Joystick:

In this case, joystick direction affects the direction in which the "twist" occurs. When the joystick is pushed UP, the horizontal parameter increases; if pulled DOWN, it decreases. If the joystick is pushed LEFT, the vertical parameter decreases; if pushed RIGHT, it increases.

Joystick movement affects [TWIST] direction as shown below and on the following page:



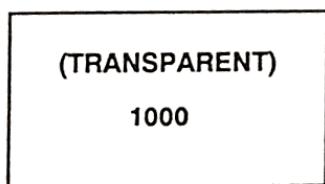


Until the desired parameters are obtained.

Keypad: Not recommended for setting [TWIST] parameters.

[TRANSPARENT], like [TWIST], is another simple effect that allows fade in/fade out of the image to/from a set level of transparency. Image parameters can be adjusted to either end the fade with the image 100% transparent or partially opaque.

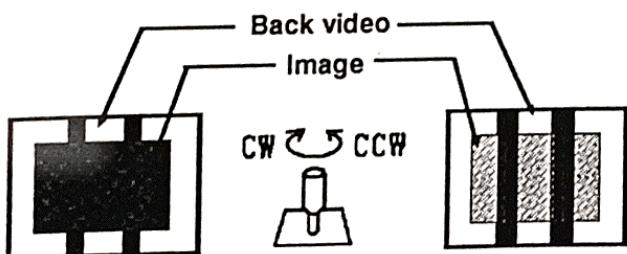
Once [TRANSPARENT] is selected a display similar to the following will appear:



Where: Parameter range = 0 - 1000
Default = 1000 (no transparency)
Value only = 0 (total transparency)

To change the shown parameters:

Joystick:



Until the desired parameters are obtained.

Note: [SET] must be selected after parameter changes are complete during programming or editing

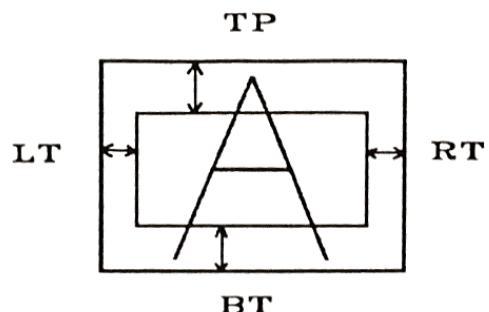
Where CW increases the transparency of the image at fade end (up to 1000).

Where CCW decreases the transparency of the image at final fade end (down to 0).

Keypad: [TRANSPARENT] ⇒ Select a number, 0 - 1000, on the numeric keypad ⇒ Press [ENTER]* in the DIRECT TAKE section.

*Note: [SET] must be selected after parameter changes are complete during programming or editing

[CROP] is used to "blank out" selected widths of the image edges in order to limit the area in which effects are performed.



Once [CROP] is selected a display similar to the following will appear:

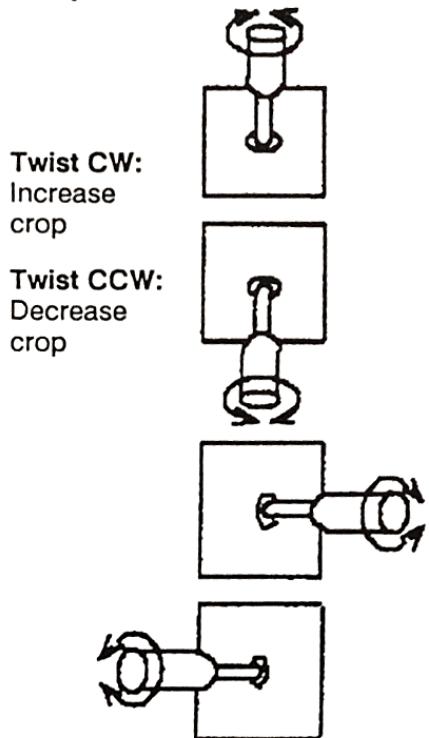
(LT)	(RT)	(TP)	(BT)
0500	0500	0500	0500

Where:

- LT = left image edge
- RT = right image edge
- TP = top image edge
- BT = bottom image edge
- All parameter ranges = 0 - 1000
- Default = 0

To change the shown parameters:

Joystick:



Until the desired parameters are obtained.

Note: All parameters will be 0 when the joystick is exactly centered.

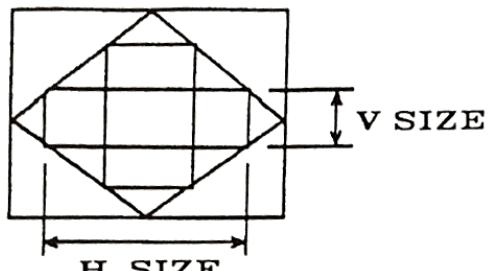
Note 2: [SET] must be selected after parameter changes are complete during programming or editing

Keypad: [CROP] \Rightarrow Select [PREV] or [NEXT] to choose a parameter. \Rightarrow Select a number, 0-1000 on the numeric keypad.

\Rightarrow Press [ENTER]* in the DIRECT TAKE section.

*Note: [SET] must be selected after parameter changes are complete during programming or editing

[ASPECT] changes the vertical to horizontal size ratio to distort the image in either one or both directions.



When [ASPECT] is chosen, a display similar to the following will appear.

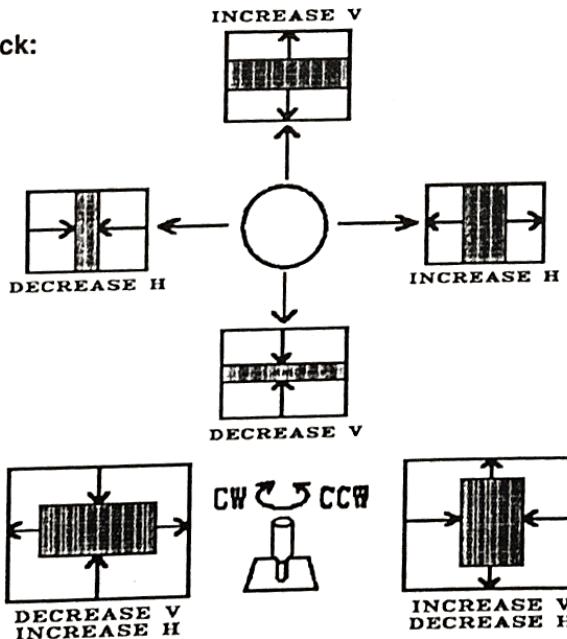
(H SIZE)	(V SIZE)
1000	1000

Where: Parameter ranges = 7999 ~ 0

Default for all parameters = 0

To change the shown parameters:

Joystick:



Until the desired parameters are obtained.

Note: All parameters will be 0 when the joystick is exactly centered.

Note 2: [SET] must be selected after parameter changes are complete during programming or editing.

Keypad: [ASPECT] \Rightarrow Select [PREV] or [NEXT] to choose a parameter. \Rightarrow Select a number, 0-7999 on the numeric keypad.

\Rightarrow Press [ENTER]* in the DIRECT TAKE section.

*Note: [SET] must be selected after parameter changes are complete during programming or editing.

[PERSPECTIVE] changes the viewing angle of the rotated image and involves how close to, or how far from, the viewpoint the image appears to be. When the (LEVEL) parameter is 0, an infinite distance will appear to exist between the image and the viewpoint.

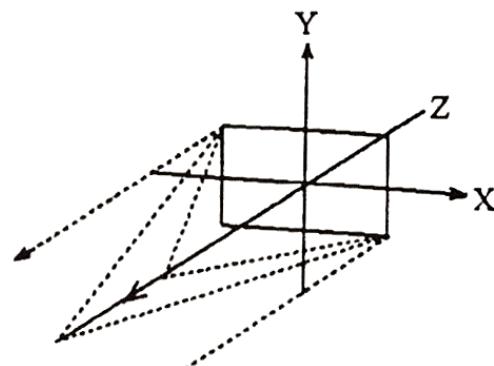
Once [PERSPECTIVE] is selected, a display similar to the following will appear.

TYP	<DIR>	(LEVEL)
0	+0000	0300

Where: TYP and <DIR> are non-changeable parameters.

LEVEL parameter range = 0 ~ 7999

Default = 1000



Changes in perspective angle

To change parameters:

Joystick:



Until desired parameters are obtained, then select [SET].

Note: [SET] must be selected after parameter changes are complete during programming or editing.

Keypad: [PERSPECTIVE] ⇒ Select [PREV] or [NEXT] to chose a parameter. ⇒ Select a number, 0 ~ 7999, on the numeric keypad.

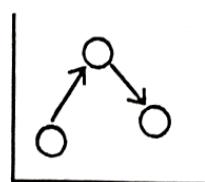
⇒ Select [ENTER]* in the DIRECT TAKE section.

*Note: [SET] must be selected after parameter changes are complete during programming or editing.

[SMOOTH] and **[CUT]** are used to select the type of interpolation (movement) that occurs during effects performance. Usually, when a parameter is displayed, it will be surrounded by "brackets". Different "brackets" indicate which of the three different types of interpolation will occur.

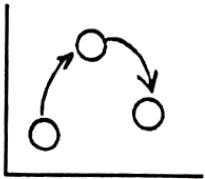
- 1.) Linear interpolation moves the image directly from point-to-point in a straight line.

< > = LINEAR =



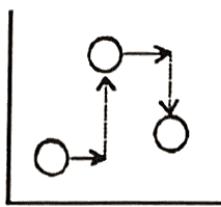
- 2.) Curvature interpolation "rounds out" effects movement to give a smooth motion flow.

() = CURVATURE =



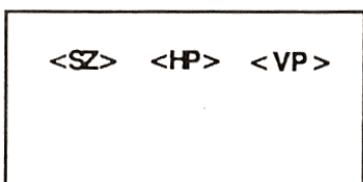
- 3.) No interpolation causes the image to move from point-to-point with a slide/jump motion.

[] = NO INTERPOLATION =



The interpolation of any "bracketed" effect can be changed by using [SMOOTH] or [CUT].

For example, if [POS/SIZE] is selected the following display may appear:



Where: = Linear interpolation during effects performance.

To change the interpolation of any parameter, select the parameter using [PREV] or [NEXT], then press [CUT] or [SMOOTH]*.

Once the desired interpolation is obtained, press [SET].

Pressing [SMOOTH] will switch the parameter brackets between < > (linear) and () (curvature).

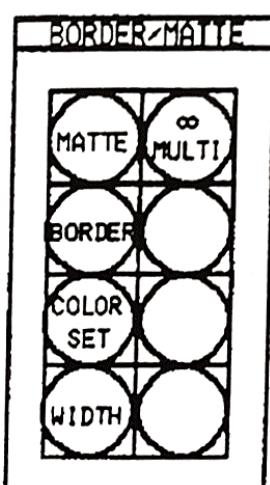
Pressing [CUT] will switch the parameter between < > (linear) and [] (no interpolation).

*In some cases, [CUT] ([SMOOTH]), then [SMOOTH] ([CUT]) will have to be selected.

For example, if the display interpolation is [] and the operator wants (), first < > must be chosen using [CUT]; then () using [SMOOTH].

5-10. BORDER/MATTE

This section contains four functions related to border effects and the internally generated background (BGND) color matte plus the [∞ MULTI] function, which gives practically unlimited multi-image capability to the MF-3000/3000P.



[MATTE] allows the operator to select the internally generated color matte as the background video.

[BORDER] allows the operator to place a colored border effect around the image.

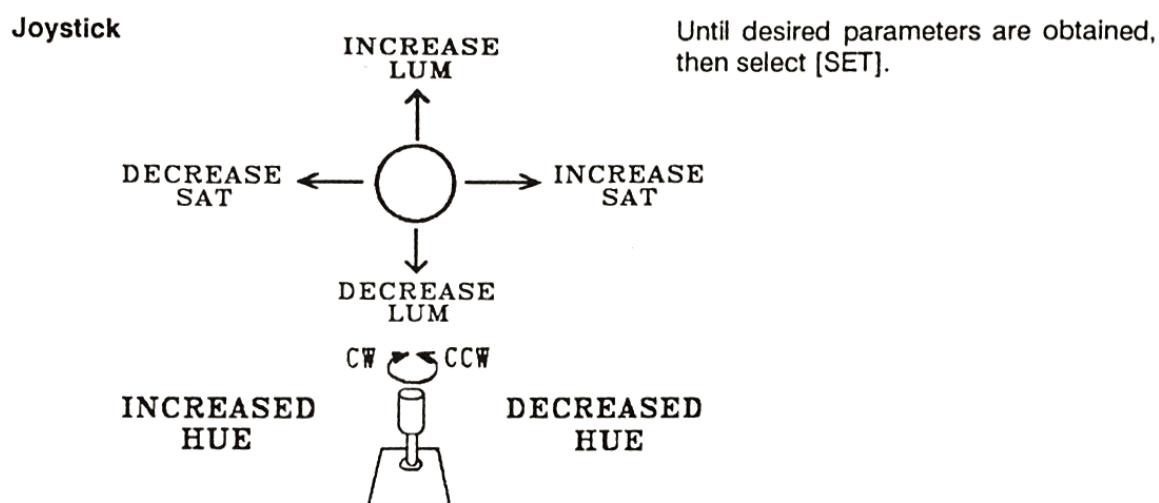
[COLOR SET] must be selected in conjunction with [BORDER] or [MATTE] to change the color settings of either the effects border or the internally generated color matte.

Once [MODIFY], [MATTE] or [BORDER] and [COLOR SET] are selected, a display similar to the following will appear:

(SAT)	(HUE)	(LUM)
100	300	100

Where: SAT (saturation) range = 0 ~ 100
 Default = 50
 HUE range = 0 ~ 359
 Default = 0
 LUM (luminance) range = 0 ~ 100
 Default = 50

To change parameters:



Keypad [BORDER] \Rightarrow Select [COLOR SET] \Rightarrow Select [PREV] or [NEXT] to choose a parameter.
 or
 [MATTE]
 \Rightarrow Select a number within the parameter range on the numeric keypad. \Rightarrow Select [ENTER], then [SET].

[WIDTH] must be selected in to change the horizontal and/or vertical widths of the effects border.

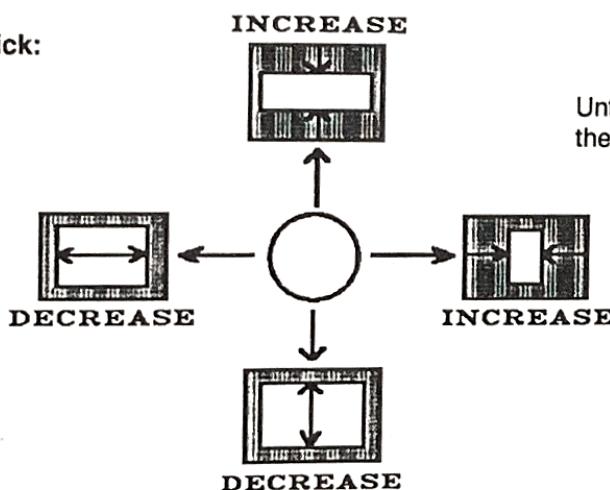
Once [WIDTH] is selected, a display similar to the following will appear:

BORDER WIDTH
(H=1000) (V=1000)

Where: H (horizontal) width = 0 - 1000
 Default = 100
 V (vertical) width = 0 - 1000
 Default = 100

To change parameters:

Joystick:



Until desired parameters are obtained,
then select [SET]

Keypad: [BORDER] → Select [WIDTH] → Select [PREV] or [NEXT] to choose a parameter.

→ Select a number within the parameter range on the numeric keypad. → Select [ENTER], then [SET].

[INFINITE MULTI] (∞ MULTI) is one of the most impressive effects the MF3000/3000P has to offer. It can be combined with effects in both the PICTURE CONTROL and SUB EFFECT sections and with [FADE], [FADE] + [REV], [MIRROR H], [MIRRORV] and [SPIN] in the DIRECT TAKE section.

Note: It can also be combined with [MULTI MOVE] in the DIRECT TAKE section, but this cancels [∞ MULTI] and only ordinary [MULTI MOVE] effects can be performed.

[∞ MULTI] allows the operator to create an infinite number of repeated images within the effects area.

Once [MODIFY] and [∞ MULTI] are selected a display similar to the following will appear:

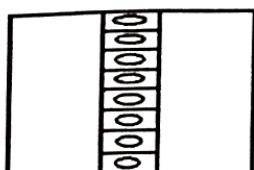
[HOR]	[VERT]
0000	0000

Where: All parameters start at 0 and have no upper limit or default value.

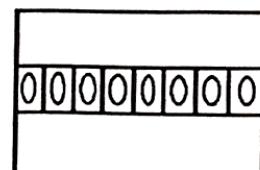
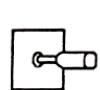
If one of the parameters is set to 0, while the other has a positive value a "film strip" effect will occur.

For example:

If H is 0



If V is 0



To increase or decrease total image repetition:

After selecting [MODIFY] and [∞ MULTI] and changing the display parameters, next select [POS/SIZE] in the PICTURE CONTROL section. Move the joystick as shown below.

Joystick



Until the desired parameter is obtained, then select [SET].

INFINITE MULTI EFFECT EXAMPLES

* < > = Linear interpolation () = Curvature interpolation [] = No interpolation

Example A.

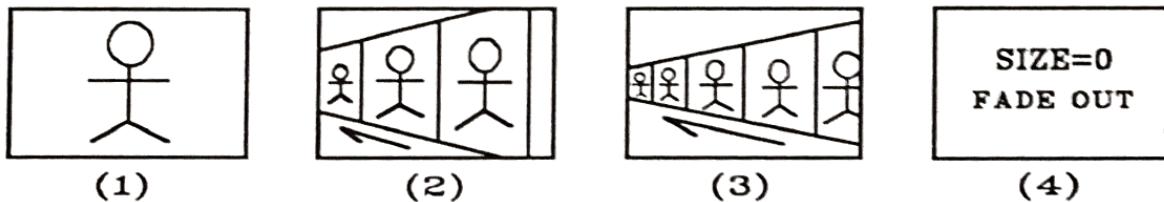


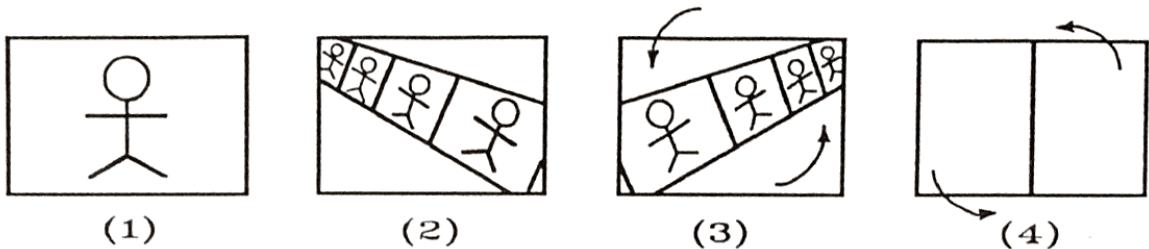
Image shifts and runs to the left edge into a fade out. In this case the image can be cleared (faded out) by setting the size parameter to 0 or by adding the FADE function to the image.

EFFECT PARAMETERS

[∞ MULTI] HOR only ON ("film strip effect")

KEYFRAME	POS/SIZE	AXIS	GLOBAL ROT	LOCAL ROT
1	<1000, 0, 0>	<1500, 0, 0>	<0, 0, 0>	<0, 0, 0>
2	<1000, 0, 0>	<0, 0, 0>	<-50, 0, 0>	<0, 0, 0>
3	<0, 0, 0>	<-500, 0, 0>	<-50, 0, 0>	<0, 0, 0>

Example B.



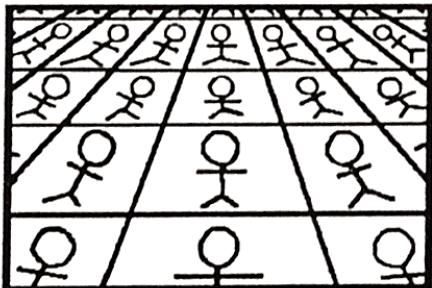
In this case, the image will disappear when 90° rotation is applied to the input image during effect performance.

EFFECT PARAMETERS

[∞ MULTI] HOR only ON ("film strip effect")

KEYFRAME	POS/SIZE	AXIS	GLOBAL ROT	LOCAL ROT
1	<1000, 0, 0>	<- 500, 0, 0>	<0, 0, 0>	<0, 0, 0>
2	<500, 0, 0>	<0, 0, 0>	<0, 50, 40>	<0, 0, 0>
3	<500, 0, 0>	<0, 0, 0>	<90, 0, -90>	<0, 0, 0>

Example C.



In this case, the created image has a receding plane perspective which appears to shift side to side during the course of effect performance.

Note: Parameters are shown below and continued on the following page.

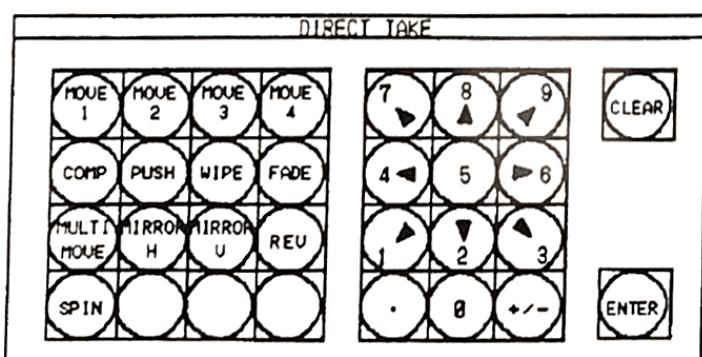
EFFECT PARAMETERS

[∞ MULTI] HOR and VERT both ON

KEYFRAME	POS/SIZE	AXIS	GLOBAL ROT	LOCAL ROT
1	<0, 0, 0>	(0, 0, 0)	<0, 63, 0>	<0, 0, 0>
2	<500, 0, 0>	(0, 0, 0)	<0, 63, 0>	<0, 0, 0>
3	<500, 0, 0>	(500, 0, 0)	<0, 63, 0>	<0, 0, 0>

KEYFRAME	POS/SIZE	AXIS	GLOBAL ROT	LOCAL ROT
4	<500, 0, 0>	(0, 1000, 0)	<0, 63, 0>	<0, 0, 0>
5	<500, 0, 0>	(-500, 500, 0)	<0, 63, 0>	<0, 0, 0>
6	<500, 0, 0>	(0, 0, 0)	<0, 63, 0>	<0, 0, 0>
7	<500, 0, 0>	(500, -500, 0)	<0, 63, 0>	<0, 0, 0>
8	<500, 0, 0>	(0, -1000, 0)	<0, 63, 0>	<0, 0, 0>
9	<500, 0, 0>	(-500, -500, 0)	<0, 63, 0>	<0, 0, 0>
10	<500, 0, 0>	<0, 0, 0>	<0, 63, 0>	<0, 0, 0>
11	<500, 0, 0>	<0, 0, 0>	<0, 63, 180>	<-30, 0, 0>
12	<500, 0, 0>	<0, 0, 0>	<0, 63, 1000>	<-30, 0, 0>
13	<500, 0, 0>	<0, 0, 0>	<-68, 0, 1000>	<0, 0, 0>
14	<500, 0, 0>	<0, 0, 0>	<0, 0, 1000>	<0, 0, 0>
15	<1000, -497, -488>	<0, 0, 0>	<0, 0, 1000>	<0, 0, 0>

5-11. DIRECT TAKE



This section contains a number of different effects, the numerical keypad plus the [CLEAR] and [ENTER] function keys. Some of the effects are "directional" and movement direction must be set using the numerical keypad, not the joystick. All of the "directional" effects can be performed either automatically ([AUTO] take) or manually ([MANUAL] take and fader lever movement).

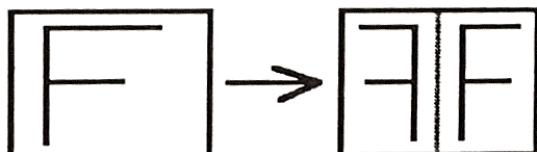
 **[CLEAR]** is used if parameters/settings are incorrectly entered during MF-3000/3000P. Do not confuse this key with [DEF] in the memory section. Even though they both "clear" parameters and settings, their functions are totally different. [CLEAR] only erases all parameters/settings entered during the current effects operation. Parameters or effects that were previously entered will not be affected.

[ENTER] must be selected anytime the keypad is used to either set a parameter value or the direction of an effects movement. In essence, it "fixes" the keypad selection as the parameter/ movement setting for the effect.

[MIRROR H] and **[MIRROR V]** are the two simplest effects in this section and create a mirror image, in either the vertical or horizontal direction (or both direction simultaneously) when they are selected.

In the case of **[MIRROR H]** and **[MIRROR V]**, no parameters will appear in the LCD display since they are straight, "push- button" type operations, with no parameter changes involved.

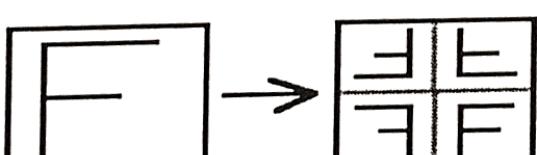
If **[MIRROR H]** is selected, one horizontal mirror image of the input image will be created.



If **[MIRROR V]** is selected, one vertical mirror image will be created.



If both **[MIRROR H]** and **[MIRROR V]** are selected simultaneously, mirror images will be created in both the horizontal and vertical directions.

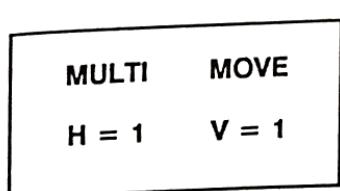


To remove the effect, select **[MIRROR H]** and/or **[MIRROR V]** a second time or select **[CLEAR]**.

While these two effects are useful, they are somewhat limited. The only effects they can be combined with are those in the SUB EFFECT section (except **[CURVE]**), **[BORDER]** and/or **[MATTE]** in the BORDER/MATTE section, and **[FADE]** or **[FADE]** and **[REV]** in the DIRECT TAKE section.

[MULTI MOVE] allows the operator to create a multiple image effect, but has a maximum limit of 81 repeated images (9H x 9V).

Once **[MULTI MOVE]** is selected, a display similar to the following will appear:



Where: Horizontal image range = 1 ~ 9

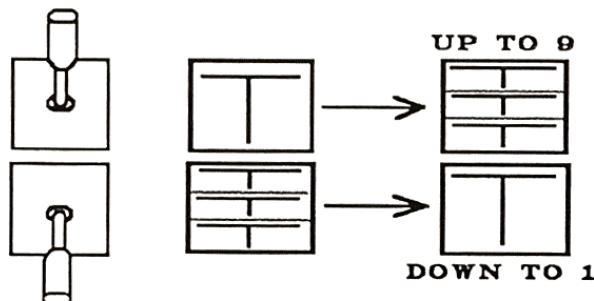
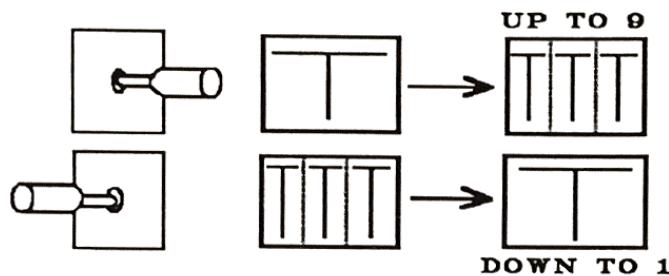
Default = 1

Vertical image range = 1 ~ 9

Default = 1

To change parameters:

Joystick:



Until the desired parameters are obtained, then press [SET].
To remove the effect, without using the joystick, select [CLEAR].

Keypad:

- 1) [MULTI MOVE] ⇒ Select [PREV] or [NEXT] to chose H or V parameter.*
- 2) [MULTI MOVE] ⇒ Select a number, 1~9*, on the numeric keypad. → Select [ENTER].

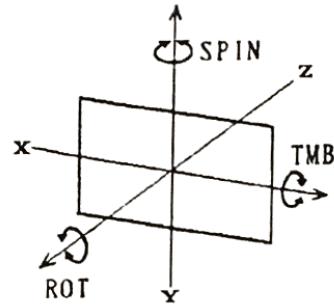
*Note: Always change the h parameter first, V second!

*Note: This will change both H and V simultaneously to the same parameter value.

To remove the effect, press [CLEAR] or use the keypad to return to one image.

Note: [MULTI MOVE] can be combined with [∞ MULTI]; however, the effect will be the same as for [MULTI MOVE] alone and no "new" effect will be created.

[SPIN] adds spin, tumble and/or rotation effects to the input image and can only be used in combination with [FADE] or [FADE] and [REV].



Once [MODIFY] and [SPIN] are selected, a display similar to the following will appear.

SPN	TMB	ROT	SYM -
+3	-4	+2	REV -

Where:

SPN (spin) = number of spins.

SPN range = -7 ~ +7

Default = 0 (no movement)

TMB (tumble) = number of tumbles.

TMB range = -7 ~ +7

Default = 0 (no movement)

ROT (rotation) = number of rotations.

ROT range = -7 ~ +7

Default = 0 (no movement)

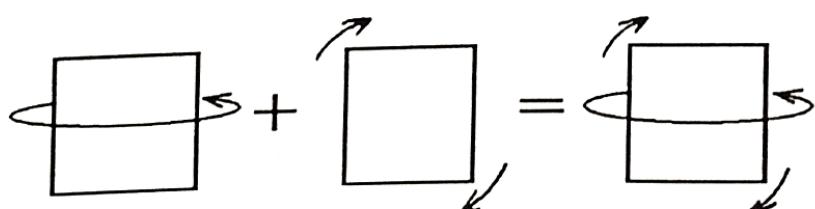
+/- = Rotation direction in conjunction with SPN, TMB or ROT parameters.

+/- = Whether reciprocal (+) or synchronous (-) action occurs between spin and tumble if positioned behind SYM

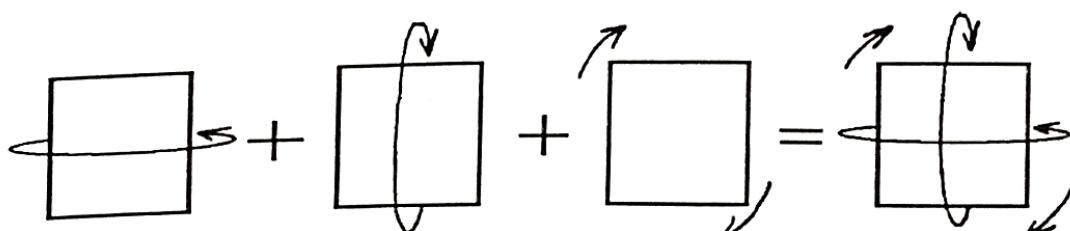
The - parameter (inhibited inversion) in this display position is nonoperational in the current model. Restrict selection to + (normal inversion).

SPN, TMB and ROT can be used in any combination to form one movement effect. Selecting a 0 for one or more of these parameters removes that movement from the overall effect.

For example, if SPN 3, TMB 0 and ROT 3 are selected, only spin and rotate are applied to the image..



But, if SPN 2, TMB 2 and ROT 3 are selected, all three are applied.



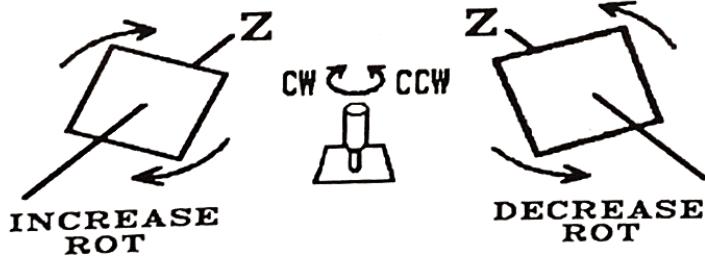
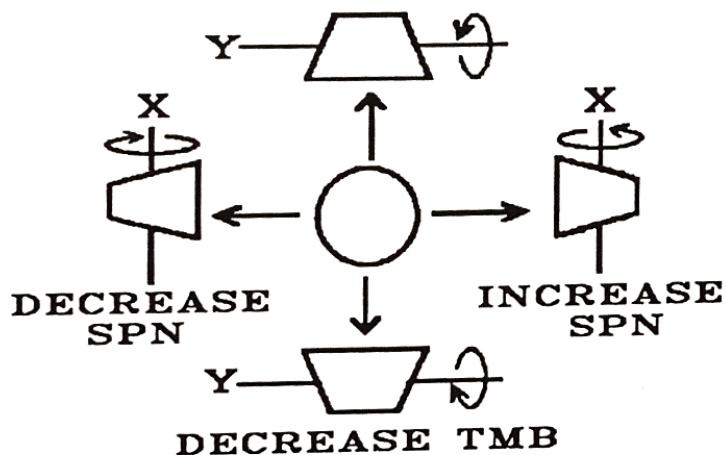
To change parameters:

Joystick: [SPIN] \Rightarrow Select [PREV] or [NEXT] to chose a parameter. \Rightarrow Move joystick to obtain desired parameter.

\Rightarrow Select [+/-] to rotation direction, type of action or inversion. \Rightarrow [ENTER] for each parameter and [SET] when changes are complete.

Where joystick movement equals:

INCREASE TMB



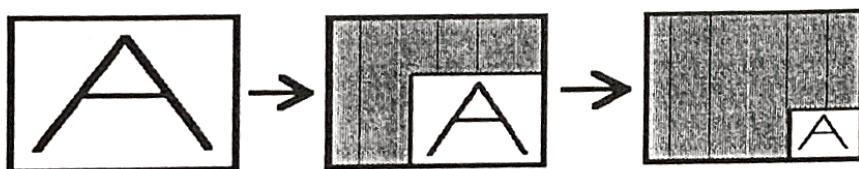
[COMP], **[PUSH]**, and **[WIPE]** are all simple directional effects. Since there are no parameters to change, no LCD display will appear when any of these are selected. The direction in which these effects occur is determined by the direction of the arrows marked on the numerical keypad. As a result, the joystick can not be used for these effects.

TO PERFORM THE EFFECTS:

(1) **[COMP]** (compression):

Select [COMP]. \Rightarrow Select a direction arrow on the numeric keypad. \Rightarrow Select [AUTO] or [MANUAL] + fader lever movement.

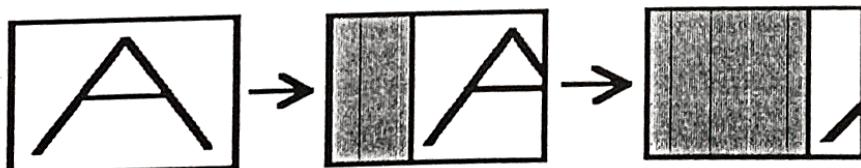
Resulting effect:



(2) **[PUSH]**:

Select [PUSH]. \Rightarrow Select a direction arrow on the numeric keypad. \Rightarrow Select [AUTO] or [MANUAL] + fader lever movement.

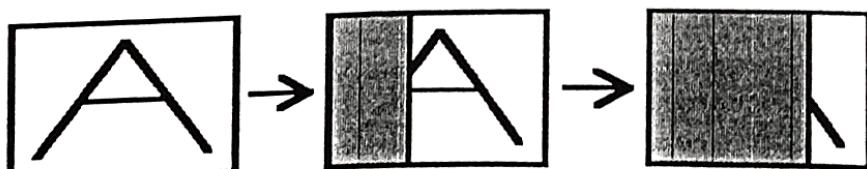
Resulting effect:



(3) **[WIPE]**:

Select [WIPE]. \Rightarrow Select a direction arrow on the numeric keypad. \Rightarrow Select [AUTO] or [MANUAL] + fader lever movement.

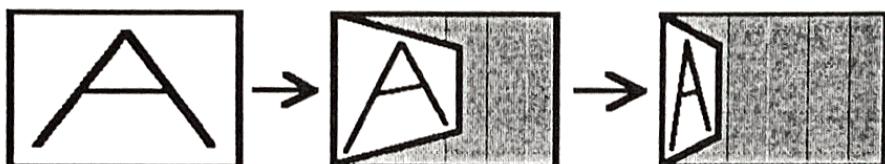
Resulting effect:



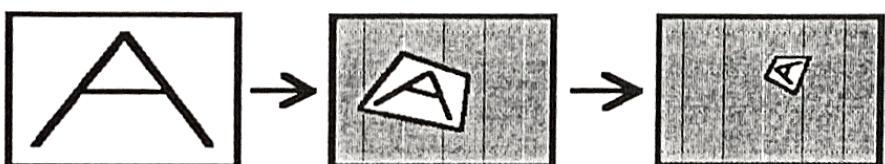
Note: If [MANUAL] and fader lever movement are chosen to perform the above three effects, the chosen effect will occur normally if the fader lever is moved in one direction only, but in reverse if moved in the opposite direction.

[MOVE 1], [MOVE 2], [MOVE 3], and [MOVE 4] are also directional like [COMP], [PUSH] and [WIPE]; however, they offer a wide variety of different factory set movement effects depending on the key and direction chosen.

For example, pressing [MOVE 1] plus the direction shown on key [4] of the numerical keypad may give you this "fall back" effect.



But, [MOVE 2] plus direction [2] could possibly give you something totally different. Perhaps a "flip and tumble" back to another position.



Because MOVES 1-4 perform so many different movement effects, they will not be shown in this manual. The operator should take the time to become familiar with what effect will occur for each [MOVE] plus direction combination. (For details on the factory set MOVE parameters, see the appendix of this manual.)

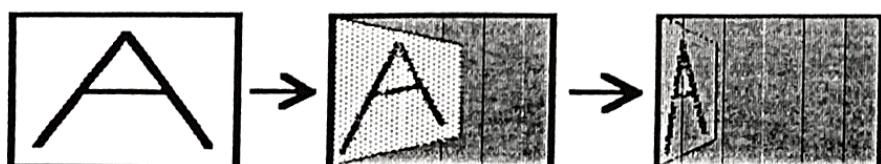
To perform a [MOVE] effect:

Select [MOVE 1] [MOVE 2] → Select a direction arrow on the numeric keypad. → Select [AUTO] or [MANUAL] + fader lever movement.

Note: If [MANUAL] and the fader lever are chosen, the effect will occur in one direction if the lever is moved up. If moved down, it will occur in the reverse direction.

[FADE] simply adds a "fade in" or "fade out" effect to the image (depending on whether or not [REV] is selected in this section).

For example, if [FADE] is added to the [MOVE 1] example shown above:



To perform a [FADE], simply select [FADE] in addition to the other effects.

In the example just shown, the following selections are made:

[MOVE 1] → Keypad direction [4] → [FADE] → [AUTO] or [MANUAL] + fader lever movement.

[REV] simply causes an effect be performed in the reverse direction.

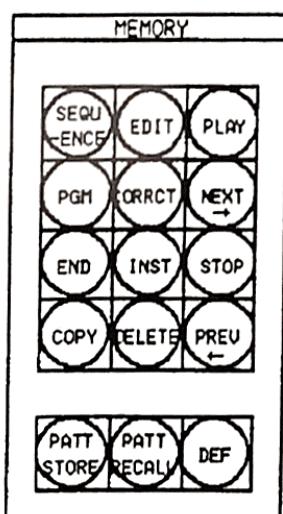
For example, to perform a [REV] effect, simply select [REV] in addition to other effects.



In the example, in the figure shown above the following selections are made:

[COMP] → Keypad direction [3] → [REV] → [AUTO] or [MANUAL] plus fader lever movement

5-12. MEMORY



This section contains the MF-3000/3000P memory related functions. [PREV] and [NEXT] are also used in conjunction with almost all of the functions on the operation panel.

Before explaining the MEMORY functions, the operator needs to know the four programming terms related to the MF-3000/3000P.

1) EFFECTS PATTERN:

Any effect stored in memory ([PATT STORE]) for later use. Total memory capacity is 100 patterns.

2) KEY FRAME:

A key frame is the basic unit of a program and refers to an image to which effects have been added. Effects can be added to an image by using the effects keys or recalling previously stored effects patterns.

3) PROGRAM:

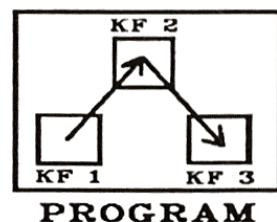
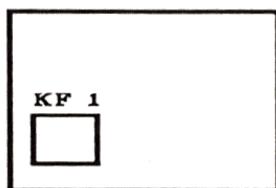
Refers to the movement/operation of a series of key frames. Total program memory capacity is up to 20 types (programs) of up to 30 steps (key frames) each.

4) SEQUENCE:

Refers to a series of programs stored and executed in sequential order. Total sequence memory capacity is up to 32 types (sequences) of up to 30 steps (programs) each.

[PGM] is used to setup a series of key frames in a sequential order to produce a smooth, overall effect. If it is a movement effect, the type of interpolation affecting image movement is determined by [SMOOTH] and [CUT] in the PICTURE CONTROL section.

For example:



TO SET UP AND STORE A PROGRAM:

Select [PGM] \Rightarrow Select a program \Rightarrow Select [ENTER] \Rightarrow Create an effects designation number 1-20 on the numeric keypad
 \Rightarrow Select [SET] & [END]

For example, to store effects as program 13;

Select [PGM] \Rightarrow [1] \Rightarrow [3] \Rightarrow [ENTER]

A display similar to the following should appear.

PGM	NO	DUR	MODE
13	1	13:12	NOM

Where:
PGM = Designated program number.
NO = Step (key frame) number in the program to which effects are being added.
DUR = Duration time of key frame performance (see TAKE section/[DURATION]) for details.
MODE = Speed at which the effect is performed.

Note: For details on effects preparation and setup, in addition to details on LCD display parameters, refer to the descriptions of the functions concerned under their respective sections.

The important function keys related to programs are:

[DURATION] = Used to set duration time of each key frame

[+/-] = Used to select and set the speed of the key frame (effect).

Where: NOM is normal/constant speed.

ACC* is accelerated speed.

DEC* is decelerated speed.

Speed moves from NOM ACC DEC NOM each time **[+/-]** is pressed.

* ACC and DEC are non-operational in the current model. Restrict selection to NOM!

[PATT STORE] = Used to store key frames in program as effects patterns.

[PATT RECALL] = Used to recall previously stored effects patterns for use as key frames.

[DEF] = Clears all entered parameters and returns the MF3000/3000P to its initial operational status.

[ENTER] = "Fixes" settings input using the numeric keypad.

[SET] is used to store the parameters of each key frame; **[ENTER]** is selected after each keypad entry and **[SET]** is selected after all parameters related to the key frame have been stored.

To continue with setting up program 13;

Select **[PGM]** \Rightarrow **[1]** \Rightarrow **[3]** \Rightarrow **[ENTER]**

Next;

Create an effects \Rightarrow **[SET]** \Rightarrow Create an effects \Rightarrow **[SET]** \Rightarrow etc.
image (key frame 1) image (key frame 2)

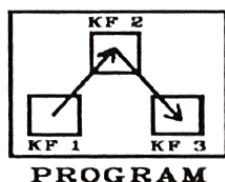
After all program steps (key frames) have been completed, select **[END]** to complete program storage.
[CLEAR] is used to remove current entries if operator error occurs.

TO PLAY A STORED PROGRAM:

Select **[PLAY]** \Rightarrow Select the number of the \Rightarrow **[ENTER]** \Rightarrow Select **[AUTO]** or
desired program on the **[MANUAL]** + fader
numeric keypad lever movement to
perform program play.

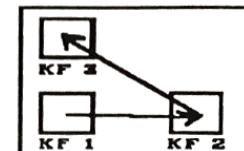
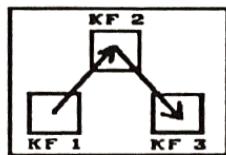
[SEQUENCE] is used to organize a series of programs (up to 30) in sequential order for playback. Total memory capacity is 32 sequences.

For example:



PROGRAM 1

PROGRAM 5



SEQUENCE

Note: In the MF3000/3000P [SEQUENCE] only organizes the programs in a sequential "file". Upon playback, [AUTO] or [MANUAL] take must be selected for each program in the sequence. Playback does not occur automatically program to program!

TO SET UP AND STORE A SEQUENCE:

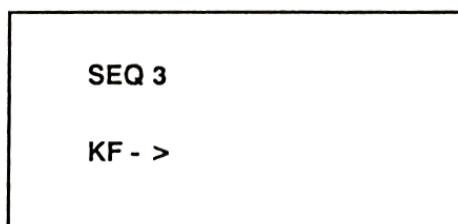
Select [SEQUENCE], \Rightarrow Select a sequence designation number 1~32 on the numeric keypad. \Rightarrow [ENTER] \Rightarrow Select a program number to be entered as part of the sequence
 \Rightarrow [ENTER]* \Rightarrow Select [END]

* Repeat from select a program number to [ENTER] until all programs in the sequence are entered before selecting [END].

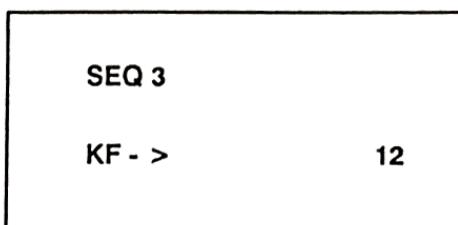
For example, if programs 12, 1, 17 and 3 are chosen as sequence 3:

LCD DISPLAY

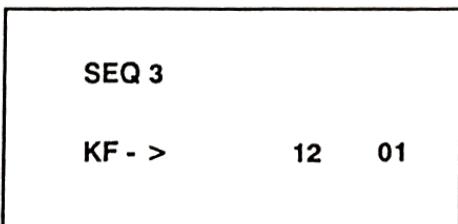
1) [SEQUENCE] \Rightarrow [PGM] \Rightarrow [3]
 \Rightarrow [ENTER]



2) [1] \Rightarrow [2] \Rightarrow [ENTER]



3) [0] \Rightarrow [1] \Rightarrow [ENTER]



4) [1] → [7] → [ENTER]

SEQ 3

KF - > 12 01 17

5) [0] → [3] → [ENTER]

SEQ 3

KF - > 01 17 03

6) [END]

LCD display clears

TO PLAY A SEQUENCE:

Select [SEQUENCE], ⇒ Select a sequence designation number 1~32 on the numeric keypad. ⇒ [ENTER] ⇒ [AUTO] or [MANUAL] + fader lever movement

⇒ First program in sequence will play ⇒ Select [AUTO] or [MANUAL] + fader lever movement ⇒ Second sequence plays

⇒ etc., until all programs in the sequence are played

When playing the SEQ 3 example shown earlier, a display similar to the following will appear.

SEQ	STEP	KF	NO
3	01	12	

Where:
SEQ = Number of the sequence being played.
STEP = Number of the step currently being performed/set.
KF = Number of the program currently being performed/set to play next.
NO = Which keyframe of the program is currently playing (or last program key frame played*).

*When the designated sequence is initially played (first program in the stored sequence) no parameter value will appear under NO since it pertains to the last key frame of the previously played program in the sequence.

For example, during first program play in the SEQ 3 example, the LCD display should appear as shown earlier:

SEQ	STEP	KF	NO
3	01	12	

But, when the first program finishes playing, the display will change to*:

*If program 12 consists of a total of 3 key frames.

SEQ	STEP	KF	NO
3	02	01	03

[COPY] is used to copy a previously stored program/sequence.

TO COPY A SEQUENCE:

Select [SEQUENCE] \Rightarrow Select the designated number of the sequence to be copied from \Rightarrow [ENTER] \Rightarrow Select designated number of the sequence being copied to
 \Rightarrow [ENTER]

Note: The procedure for copying a program is similar to copying a sequence. First select [COPY], then [PGM].

For example, to copy sequence 3 to 17:

1) [SEQUENCE] \Rightarrow [COPY] \Rightarrow [3]
 \Rightarrow [ENTER]

LCD DISPLAY

SEQ	SRC	DEST
3	-	>

Note: Input values can be changed by selecting [CLEAR].

2) [1] → [7]

SEQ	SRC	DEST
3 - >		17

3) [ENTER]

LCD display clears.
Sequences 3 and 17 are
now the same.

[END] is used to terminate program setups or sequence programming (see [PROGRAM] or [SEQUENCE] section for examples of use).

[PREV] and [NEXT] are used to switch between LCD display parameters (see other sections for examples of use).

[EDIT] is used to correct or change previously entered programs.

TO EDIT A PROGRAM:

Select [EDIT] → Select the number of the → [ENTER]
program to be corrected

For example, if program 3 contains key frames needing to be edited.

LCD DISPLAY

1) [EDIT] ⇒ [3] ⇒ [ENTER]

PGM
3

2) Perform [AUTO] or [MANUAL] take to play the program. Play the entire program during [AUTO] take or stop it at the point to be corrected by depressing the [STOP] key.

Or perform a [MANUAL] take, move the fader level to the correction point and [STOP].

PGM	NO	DUR	MODE
03	01	01:00	NOM

- 3) Use [PREV] or [NEXT] to select the step (key frame) to be corrected. ([PREV]/[NEXT] will move the step NO either forward or back.)

PGM	NO	DUR	MODE
03	01	01:00	NORM

- 4) Select how the program will be corrected.

[INST] to insert before the current step.

[CORRECT] to change the current step.

[DELETE] to remove the current step.

Note: In the example, only [CORRECT] can be performed since the step "NO" indicated on the LCD display is for continued key frame input. DEL and INS can not be performed.

- 5) Set the effect to be corrected.
- 6) Select [DURATION] and select a speed mode. (Limited to "NOM" in current model. See [DURATION] and [PGM] for procedure)
- 7) Enter the effect and select [SET].
- 8) Return to step 3 and repeat the remaining steps in sequence to perform another correction.
- 9) When all corrections have been made, select [END] to close editing.

Note: If you wish to delete an entire program from a sequence, it is recommended that the operator simply reprogram the sequence. [EDIT] and [DELETE] can not be used to remove an entire program.

[PLAY] is used to initiate playback of programs and sequences (see [PGM] and [SEQUENCE] for examples of use).

[CORRECT] (correct) is used in conjunction with [EDIT] to alter previously stored programs (see EDIT for examples of use). Corrections must be made key frame by key frame and extensive changes could take an excessive period of time. In such cases it is, therefore, faster to simply reprogram the entire program or sequence rather than use the correction function.

[INST] (insert) is used to add new key frames/effects in conjunction with [EDIT] to previously stored programs (see EDIT for examples of use).

[DELETE] is used in conjunction with [EDIT] to remove key frames/effects from previously stored programs (see EDIT for examples of use).

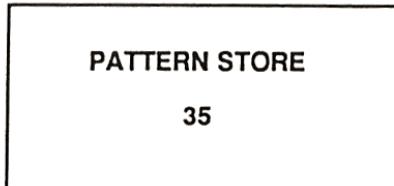
[STOP] is used to "pause" program takes at a desired point during [EDIT] and [PATT STORE] operations.

[PATT STORE] (pattern storage) is used to place a variety of effects patterns in memory for use in program setup.

TO STORE A PATTERN:

Select [PATT STORE] → Select a designation ⇒ [ENTER]*
number, 0-99, on the
numeric keypad

LCD will show a display
similar to the one here:



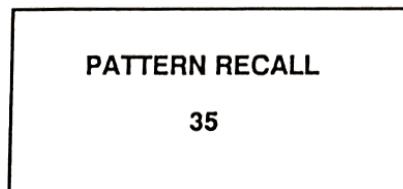
*[ENTER] will input the current effect being performed by the MF-3000/3000P into memory under the designated pattern number.

[PATT RECALL] (pattern recall) is used to recall previously stored effects patterns for use in program setup.

TO RECALL A PATTERN:

Select [PATT RECALL] → Select the desired effects ⇒ [ENTER]
pattern number on the
numeric keypad

LCD will show a display
similar to the one here:



[DEF] (default) is used to reset the MF3000/3000P to its initial operational parameters (i.e. image will return to full-screen size, center positioned, no effects).

Since the memory has a battery back-up, [DEF] will not affect any programs or sequence placed in memory during the previous period the MF-3000/3000P was in operation.

Also, changes in [CURVE], [PAINT], [MOSAIC] and [STROBE] parameters (in the SUB EFFECTS section) will not be affected by initiation of [DEF].



SECTION 6.

COMMON OPERATIONAL PROBLEMS

FAULT	PROBABLE CAUSE / SYMPTOM	SOLUTION
1) DIRECT TAKE functions can not be performed in AUTO.	Selected program has no duration time set (LCD shows 00:00).	Input a duration time.
2) Speed mode can not be changed from DEC.	Unprogrammed number selected for EDIT.	Clear memory by momentarily disconnecting JP4 connector (BATT. BACKUP) inside operation unit. Warning! Programs and effect patterns entered by the customer will be erased upon performance of this procedure.
3) Incorrect play in ACC and DEC speed modes.	Current program can not support ACC and DEC speed modes.	Select only NOM mode. Do not select ACC or DEC.
4) MOSAIC and PAINT effects operate incorrectly during program execution.	If key frame is programmed with curvature interpolation, effect level 7 of PAINT and MOSAIC can not be used.	Set PAINT and MOSAIC effect level to 6 or below when using curvature interpolation.
5) Program will not register under selected number.	Even if [CLEAR] is selected to stop program entry during setup, the unit remains ready to accept an input program number. Can not continue program setup.	When unit is ready to accept an input program number; press [CLEAR] once again and exit program mode. Try initiating program setup again.
6) Image suddenly changes during program EDIT when setting is changed.	If operator tries to change CURVE, PAINT, MOSAIC, STROBE or BORDER WIDTH settings, last parameter change appears instead of key frame value to be modified.	Start over and reset CURVE, PAINT, MOSAIC, STROBE and BORDER WIDTH values.
7) No operation when a standby key (illuminated orange) is selected.	CURVE, PAINT, MOSAIC, STROBE, ∞ MULTI, and BORDER WIDTH parameter values are invalid.	Input valid parameter values using MODIFY. To modify strobe parameters, first set NEG or FREEZE to ON.

FAULT	PROBABLE CAUSE / SYMPTOM	SOLUTION
7) No operation when a standby key (illuminated orange) is selected.	Standby (illuminated orange) CURVE, PAINT, MOSAIC or GPI keys do not go to active (green) when selected.	Press corresponding key twice.
8) MOSAIC not operational at upper image edge.	Upper mosaic block only performs the effect vertically, not horizontally. If the first horizontal line has no signal, a black band will appear at the upper edge.	Requires new software to correct. (Under planning)
9) Program is not executed completely.	During sequence PLAY by AUTO take, one program stops a few key frames prior to the final.	Execute each program in the sequence by MANUAL TAKE to locate problem frame.
10) Fader lever non-operational, even when MANUAL TAKE key is green.	After sequence play by MANUAL TAKE, MANUAL key does not return to standby (orange) and stays active (green), even if program is switched in and out using PREV and NEXT.	Press MANUAL key again.
11) MANUAL TAKE key will not go to active (green).	During EDIT, MANUAL TAKE will not go to active (green) from standby (orange). Instead, goes inactive (OFF).	Ignore. Take operation will still be performed, regardless of indication.
12) BORDER key will not go to activate (green).	If border width is set to 1, key will not activate (green).	Set border width between 2 and 1000. Note: If either or both V and H are set to '1', [BORDER] will activate.
13) ∞ MULTI key will not go to activate (green).	If ∞ MULTI is set to 1, key will not activate (green); however, effect will still be performed.	Set ∞ MULTI between 2 and 1000. Note: If either or both V and H are set to '1', [∞ MULTI] will activate.

FAULT	PROBABLE CAUSE / SYMPTOM	SOLUTION
14) Numeric key pad inoperable.	∞ MULTI settings can not be entered via numeric key pad.	Use joystick to set ∞ MULTI parameters.
15) Joystick inoperable.	SETUP 09 parameter is set to '0' and joystick movement is disabled.	Joy stick speed should always be set 1 ~ 9. Do not set joystick speed to '0'.
16) Improper CROP	When setting CROP, if joystick is centered and rotated, only right picture edge is affected.	Compensate by tilting joystick towards picture edge requiring crop.
17) ASPECT parameters change after being set.	Using ASPECT and SIZE (POS/SIZE) simultaneously, causes H size, V size and SIZE parameters to become equal.	Do not use ASPECT and POS/SIZE simultaneously if either H size, V size or SIZE is set to 0 (H SIZE and SIZE are always the same value.)
18) Picture breaks up when expanded.	If V size becomes > 7999 (over maximum setting) when H size < V size and picture is expanded, picture stability can not be maintained and break up occurs.	Do not use ASPECT and POS/SIZE simultaneously.
19) No SIZE interpolation.	Different interpolation modes set for H and V ASPECT parameters.	If you wish to add interpolation to PROGRAM size variation, use the same interpolation modes for H and V ASPECT parameters.
20) Unit is controlled by the GPI when it should not be.	External AUTO is executed even when GPI ENABLE is in standby (orange.)	Press GPI ENABLE key once.
21) Loss of REV during 'same TAKE' operation.	If CLEAR is selected at any time during <u>repeat performances of the same TAKE</u> , the REV effect is lost even though REV shows as active (illuminated green).	Reset all effect parameters again before trying to repeat the TAKE. DO NOT select CLEAR again until repeated TAKEs are completed and a new effect is required.
22) SPIN rotation parameter does not operate correctly.	SPIN reverses during effect performance.	Set REV SPIN parameter to +.

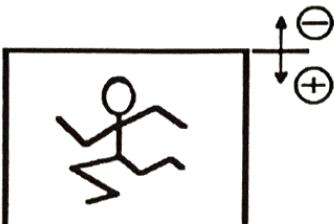
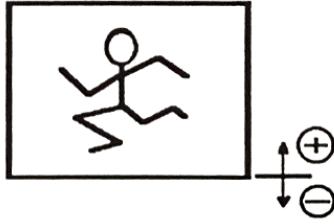
FAULT	PROBABLE CAUSE / SYMPTOM	SOLUTION
23) SPIN effect inoperable.	After SPIN execution, if CLEAR and AUTO/MANUAL are pressed in sequence, operation panel lamp display shows SPIN as operating, but image does not change.	Press CLEAR once and restart operation from SPIN selection.
24) FADE always performed during SPIN operation.	After SPIN and FADE operations have been used together, fade in/out operation is constantly carried out when SPIN is initiated, even if FADE is set to OFF.	Press CLEAR once and restart operation from SPIN parameter selection.
25) FADE always performed.	After MULTI MOVE and FADE operations have been used together, fade in/out is constantly carried out, even if CLEAR is pressed and FADE returns to standby (orange).	Press FADE, then CLEAR. PROGRAM and DIRECT TAKE operation should return to normal.
26) Even if DEF is selected, no picture appears.	After MULTI MOVE and FADE operations have been carried out together fade out effect is still performed even after CLEAR is selected.	Press FADE, then CLEAR.
27) TRANSPARENT function is non-operable.	After MULTI MOVE and FADE operations have been carried out together fade in/out is still performed even after CLEAR is selected.	Press FADE, then CLEAR.

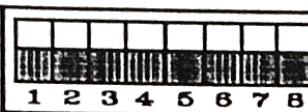
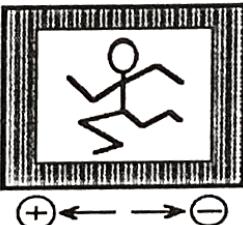
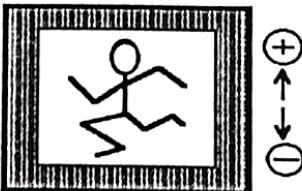
SECTION 7.

Functions and Settings of 3D Effect Card DIP Switches

Functions listed below are applicable to the following products; PM2945-1 from S/N. 3170021, MF-3000; S/N. 3180031, MF- 3000P; S/N. 3190021 (MF-1000-3D).

FACTORY SHIPMENT SETTING	SWITCH FUNCTIONS / SETTINGS
DSS1 Dark area indicates switch setting.	<p>Switches 1, 2, 3 ⇒ Do not use! Always set to OFF</p> <p>Switch 4~6 ⇒ Set to OFF</p> <p>Switch 7 ⇒ Selects field freeze/frame freeze ON = Frame Freeze OFF = Field Freeze</p> <p>Switch 8 ⇒ Selects 3D or 2D anti-aliasing filter ON = 3D filter (Filter functions based on picture size and 3D rotation) OFF = 2D filter (Filter functions based on picture size only)</p> <p>* Frame freeze/field freeze selection at DSS1 (switch 7) is not incorporated in software version 1.1 (S/N.3170001 - 10, 3180001 - 10).</p>
DSS2 Dark area indicates switch setting.	<p>Fixed crop in H direction (removes black lines in right/left blanking)</p> <p>Switch 1 ⇒ Sets cropping direction (+/-) OFF ⇒ + ON ⇒ -</p> <p>Switch 2~8 ⇒ Sets cropping magnitude</p>

FACTORY SHIPMENT SETTING	SWITCH FUNCTIONS / SETTINGS
 <p>Dark area indicates switch setting.</p>	<p>Fixed crop in V direction (removes black lines in top/bottom blanking)</p> <p>Top cropping: Switches 1~4</p> <p>Bottom cropping: Switches 5~8</p>  <p>Switch 1 \Rightarrow Sets top cropping direction (+/-) OFF \Rightarrow + ON \Rightarrow -</p> <p>Switch 2~4 \Rightarrow Sets top cropping magnitude</p>
	 <p>Switch 5 \Rightarrow Sets bottom cropping direction (+/-) OFF \Rightarrow + ON \Rightarrow -</p> <p>Switch 6~8 \Rightarrow Sets bottom cropping magnitude</p>

FACTORY SHIPMENT SETTING	SWITCH FUNCTIONS / SETTINGS
<p>DSS 4</p>  <p>ON OFF</p> <p>Dark area indicates switch setting.</p>	<p>To adjust border phase relative to picture phase (Used when H and V border widths differ)</p> <p>Switch 1 \Rightarrow Sets H direction +/− OFF \Rightarrow + ON \Rightarrow −</p> <p>Switch 2~4 \Rightarrow Sets shift magnitude in H border direction</p> 
	<p>Switch 5 \Rightarrow Sets V direction +/− OFF \Rightarrow + ON \Rightarrow −</p> <p>Switch 6~8 \Rightarrow Sets shift magnitude in V border direction</p> 

* The DSS4 border phase adjustment function is not incorporated into version 1.1 of PM - 2945 (S/N.3170001 - 20, 3180001 - 30, 3190001 - 20).

FACTORY SHIPMENT SETTING	SWITCH FUNCTIONS / SETTINGS
<p>DSS 5</p>  <p>ON OFF</p> <p>1 2 3 4 5 6 7 8</p> <p>Dark area indicates switch setting.</p>	<p>All OFF</p>
<p>DSS 6</p>  <p>ON OFF</p> <p>1 2 3 4 5 6 7 8</p> <p>Dark area indicates switch setting.</p>	<p>To adjust internal Key signal phase relative to picture phase (H only) (Used when black lines are produced by KEY phase disparities outside the border)</p> <p></p> <p>Switch 1 ⇒ ON or OFF. Setting has no operational effect.</p> <p>Switch 2~8 ⇒ Allows delay time to be set in binary numbers when OFF = 1 and ON = 0 Each step = 74nS</p> <p>* In the MF-1000-3D and Dual Channel options, internal key signal phase adjustment takes place at DSI on CARD3 (COMBINER CARD).</p>

Warning

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

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