



Pattern Generators

PG-401/PG-401L

Pattern Generators Operation Manual



 EZ Digital Co.,Ltd.



Pattern Generators

PG-401/PG-401L

Pattern Generators Operation Manual



 EZ Digital Co.,Ltd.

SAFETY SUMMARY

SAFETY PRECAUTIONS

Please take a moment to review these safety precautions.
They are provided for your protection and to prevent damage to the pattern generator.
This safety information applies to all operators and service personnel.

CAUTION AND WARNING STATEMENTS.

CAUTION : Is used to indicate correct operating or maintenance procedures in order to prevent damage to or destruction of the equipment or other property.

WARNING : Calls attention to a potential danger that requires correct procedures or practices in order to prevent personal injury.

INTRODUCTION

Thank you for purchasing an EZ DIGITAL product.
The instruments produced by EZ DIGITAL are high technology products made under strict quality control.
We guarantee their exceptional precision and utmost reliability.
For proper use of this product, please read this manual carefully.

INSTRUCTIONS

1. To maintain the precision and the reliability of the product, use it in the standard settings.

Operating temperature : +10 ~ +35

Operating humidity : 45% ~ 85%

Storage temperature : 0 ~ +70

Storage humidity : less than 85%

2. For quality improvement, the exterior design and specifications of the product can be changed without notice.

3. Should any further information be required, please contact the(nearest) EZ DIGITAL service center or sales outlet.

WARRANTY

Warranty service covers one year from the date of original purchase.

In case of technical failure within a year, repair service will be provided by our service center or sales outlet free of charge.

We charge for repairs after the one-year warranty period expires.

When the failure is a result of user's neglect, natural disaster or accident, we charge for repairs regardless of the warranty period.

For more professional repair service, be sure to contact our service center or sales outlet.

CONTENTS

1. INTRODUCTION	.....	1
2. PRECAUTIONS	.....	1
2-1. ISNTALLATION AND HANDLING PRECAUTIONS		
2-2. CLEANING		
3. SPECIFICATION	.....	2
3-1. PATTERNS		
3-2. SYNC. SIGNAL		
3-3. RF OUTPUT		
3-4. SOUND SIGNAL		
3-5. VIDEO OUTPUT		
3-6. GENERAL SPECIFICA TIONS		
3-7. ACCESSORIES		
4. PANEL DESCRIPTIONS	.....	3
4-1. FRONT PANEL	.....	4
4-2. REAR PANEL		
5. OPERATIONS	.....	5
5-1. USING RF OUTPUT	.....	5
5-2. USING VIDEO OUTPUT	.....	6
5-3. PATTERN APPLICA TIONS	.....	7
5-4. SOUND SIGNAL CIRCUIT INSP	.....	10
6. MAINTENANCE	.....	10

1. INTRODUCTION

PG-401/PG-401L is a digital color pattern generator for the NTSC or PAL system. Full field color bar, crosshatch, dot, corner marker, white, red, green and blue rasters are the patterns provided.

A two-way power supply (internal rechargeable power or external DC power) makes the instrument light-weight compact design that fits easily into the pocket.

The pattern generator is used for adjustments of televisions and VTRs in service operations.

2. PRECAUTIONS

When using PG-401/401L for VTR or television adjustment, follow the instruction manual of the unit under adjustment carefully to avoid electric shocks.

In particular, be careful not to touch the primary or the TV high voltage power circuits.

2-1. INSTALLATION AND HANDLING PRECAUTIONS

When placing the Pattern Generator in service at your workplace, observe the following precautions for best instrument performance and longest service life.

1. Avoid placing this instrument in an extremely hot or cold place.
Specifically, don't leave this instrument in a close car, exposed to sunlight in midsummer, or next to a space heater.
2. Don't use this instrument immediately after bringing it in from the cold.
Allow time for it to warm to room temperature. Similarly don't move it from a warm place to a very cold place, as condensation might impair its operation.
3. Do not expose the instrument to wet or dusty environments.
4. Do not place liquid-filled containers (such as coffee cups) on top of this instrument.
A spill could seriously damage the instrument.
5. Do not use this instrument where it is subject to severe vibration or strong blows.
6. Do not place heavy objects on the instrument.
7. Do not use this Pattern Generator in strong magnetic fields, such as near motors.
8. Do not leave a hot soldering iron near the instrument.
9. Do not use the external power (9VDC adaptor) in case that using normal battery.
10. This unit may show sensitive response to ESD, thus it can be deactivated by the ESD damage.

2-2. CLEANING

1. To clean stained casing, lightly rub the stained area with a soft cloth dipped in a neutral detergent.
2. If the surface of the panel is dirty, use the same method to clean.
If the panel is heavily stained, rub the affected area lightly with a soft cloth soaked in light neutral detergent or alcohol.
3. Never use highly volatile material such as benzene or paint thinner.

3. SPECIFICATION

3-1. PATTERNS

Item	PG-401 (NTSC)	PG-401L(PAL)
Full field color bar	75% white, yellow, cyan, green, magenta, red blue and black (from the left side of the screen)	
Crosshatch	15(V) × 12(H)	15(V) × 11(H)
Dot	12(V) × 15(H)	11(V) × 15(H)
Corner Marker	White window at upper right of pattern	
White Raster Red Raster Green Raster Blue Raster		

3-2. SYNC SIGNAL

Horizontal Freq.	15.734KHz	15.625KHz
Vertical Freq.	59.94Hz	50Hz
Equalizing Pulse	Provided	
Scan	Interlaced scanning	
Subcarrier Freq.	3.579545MHz ± 200Hz	4.433619MHz ± 50Hz

3-3. RF OUTPUT

VHF LOW	55.25 ~ 83.25 MHz	C : 41.25 ~ 62.25MHz D : 49.75 ~ 85.25MHz
VHF HIGH	175.25 ~ 211.25 MHz	C : 175.25 ~ 224.25MHz D : 168.25 ~ 216.25MHz
UHF HIGH	471.25 ~ 885.25 MHz	C : 471.25 ~ 855.25MHz D : 471.25 ~ 863.25MHz
Connector	F connector	
Output Voltage		
VHF	1mVrms/min	
UHF	0.5mVrms/min	
Modulation	AM minus	

3-4. SOUND SIGNAL

Sound Carrier Frequency	4.5MHz ±20KHz	C : 5.5MHz ±5KHz D : 6.5MHz ±5KHz
Sound Frequency	Approx. 1KHz	
Sound Carrier Output	ON/OFF switchable	

3-5. VIDEO OUTPUT

Output Voltage 1Vp-p, 75 terminal, AC coupling Within ±6V
Output Impedance 75

3-6. GENERAL SPECIFICATIONS

Power source Ni-Cd Rechargeable Batt.(1.2V Type C) × 6EA
External Power 9V DC/180mA Adaptor
Size & Weight 80(W) × 172(H) × 36.5(D) , 440g with batteries

3-7. ACCESSORIES

Carrying Case 1EA
RF Cable(1.1m) 1EA
Video Cable(1m) 1EA
Adaptor (9VDC/180mA) 1EA
Instruction Manual 1EA
Ni-Cd Rechargeable Batt. 6EA
PAL Jack (PAL Only) 1EA

4. PANEL DESCRIPTIONS

4-1 FRONT PANEL



Power Switch(ON/OFF)

Power on : "02" or "01" Channel VHF section is selected

Sound : off

Pattern : Color Bar

Power off : The generator will be turned off.

Beep Sound

The generator beeps whenever you touch anyone of the buttons.

Sound Signal Switch

This is used to select Sound Signal output on/off.

Band switch (VHF, UHF VIDEO)

This is used to switch between RF and Video output.

If Video output is selected, RF output is turned off.

If VHF is selected, VHF signals of the RF Signal are output.

Likewise, if UHF is selected, UHF signals of the RF signal are output.

Channel switch

Select the channel you want by pressing this button.

Keep on pressing until the channel you want is selected.

Band Selection Indicator

Band Selection	Indicator
VHF	VHF Mark
UHF	UHF Mark
VIDEO	VIDEO Mark

External Power input terminal

This is the input connector for the external DC power supply.

The nominal input voltage is 9V, but PG-401/PG-401L operates in the range 6V to 10V.

The current consumption is approximately 140mA.

Video output connector

This BNC connector provides a composite video signal.

The output voltage is 1V p-p terminated with 75

RF output connector

The video and RF signals are AM modulated and output through this connector.

Channels in the VHF and UHF bands are covered.

The channel can be continuously changed using channel up/down switch .

LED Display

BAND	INITIAL DISPLAY	
	PG-401 (NTSC)	PG-401 (PAL)
VHF	"02"	"01"
UHF	"14"	C : "21" D : "13"
VIDEO	" - - "	

Auto Power off

- Auto Power off in case you don't touch any button for about 15 minutes.

Battery Low Mark

Change the battery when is displayed on the window.

If you want to use rechargeable batteries, you must charge them for 7 ~ 8 hours by using adapter which is enclosed.

Pattern select or buttons

These buttons are used to select the patterns.

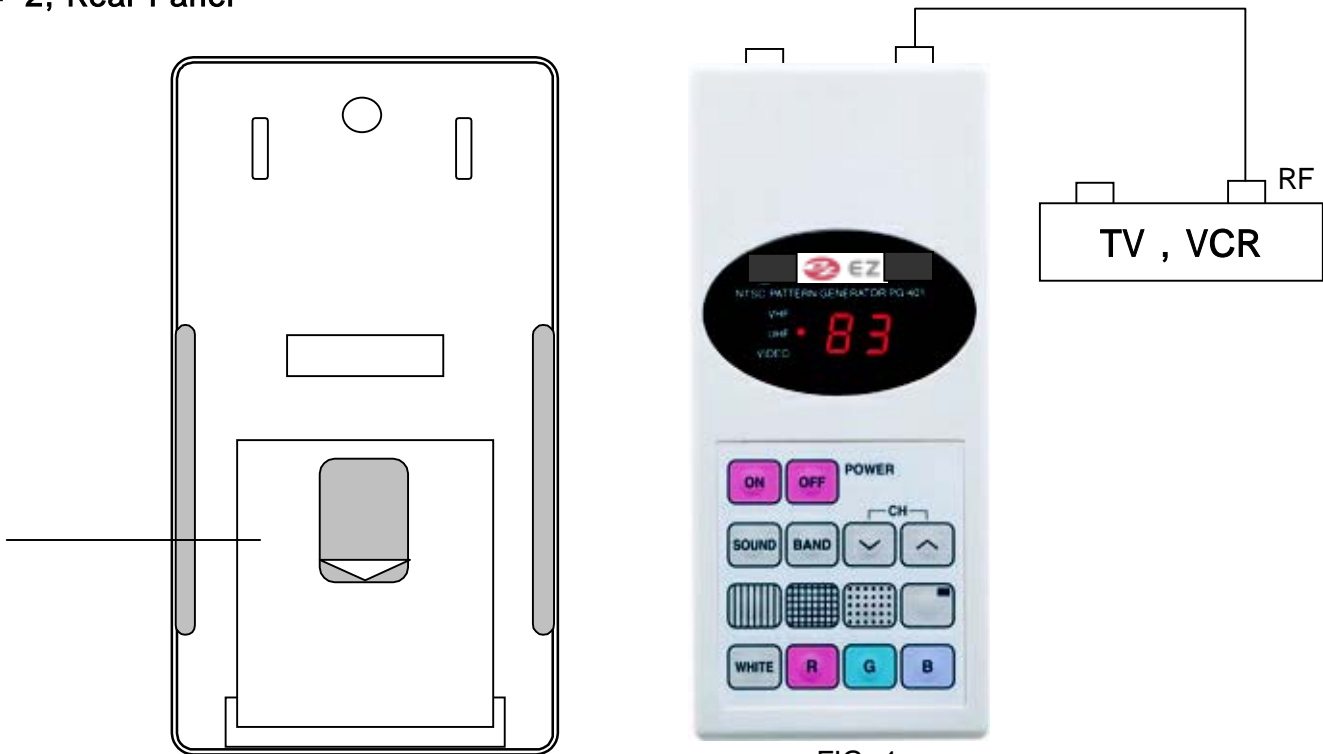
On the top row, from left to right, the buttons select full field color bars, crosshatch, dot and corner market. On the bottom row, from left to right, the buttons select white, red, green and blue rasters. To select the pattern, just press the corresponding button

When the power is turned on, a color bar pattern is always selected.

Fine adjustment knob for UHF Channel

A djust UHF channel frequency for precise tuning. By this adjustment. Close two channels may be selected.

4-2, Rear Panel



Battery compartment cover

Push down on the lower part to pull the battery case lid off.

There are six batteries of type C, which must be inserted complying with the polarity indications inside the battery compartment. If not, PG-401/PG-401L will not work.

So long as the batteries are type C, manganese, alkaline or Ni-Cd can be used.

Be sure to turn off power when the instrument is not in use to conserve battery power.

As the battery capacity decreases, the pattern will wave or not appear. Recharge or replace batteries when this happens.

5. OPERATIONS

5-1. USING RF OUTPUT

(1) Connection : When used from TV or VTR RF input, use the cable supplied to connect the PG-401/PG-401L RF OUT connector to the television or the VTR RF input terminal (See Fig. 5). If the connector of the cable supplied does not match the television or the VTR input connector, use an adaptor.

(2) Operation

- Turn the PG-401/PG-401L on, and channel "02" or "01" will be displayed on the screen.
- Set the TV or the VTR to the channel you want.
- Select VHF by pressing switch , if the channel selected on the TV or the VTR is VHF, and to UHF if it is set to UHF.
- Select the channel you want by pressing CH up/down switch, and you can observe the signal on the TV screen.
- When select UHF channel, adjust the knob for the cleanest screen.
- If sound is to be output, press SOUND switch , at which point you will be able to hear the sound at approximately 1KHz.
- Press the button to change to a new pattern.

5-2. USING VIDEO OUTPUT

(1) Connection

Connect the television or the VTR's video input to the PG-401/PG-401L VIDEO OUT connector with the accessory cable. (See Fig. 5-2)

(2) Operation

Turn the PG-401/PG-401L on, and channel "02" or "01" will be displayed on the screen.

Turn the VTR or the TV input switch to video.

Set switch on the PG-401/PG-401L to VIDEO.

Patterns from the PG-401/PG-401L are input to the VTR or TV.

Use button to select the pattern you want.

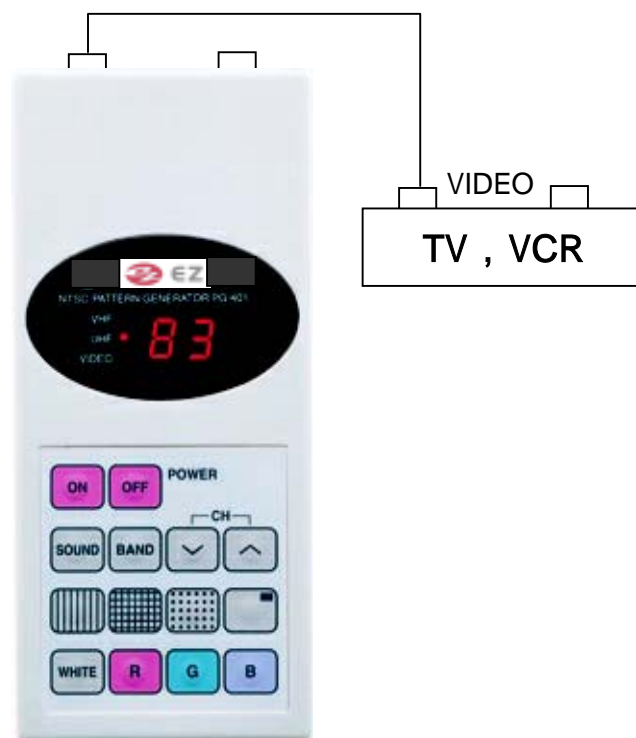


FIG-2

5-3. PATTERN APPLICATIONS

(1) Color bar pattern

The color bar pattern is the most basic signal and used to adjust and test TVs and VTRs. In particular, Fig. 5-3 shows the eight vertical color stripes of the color bar pattern.

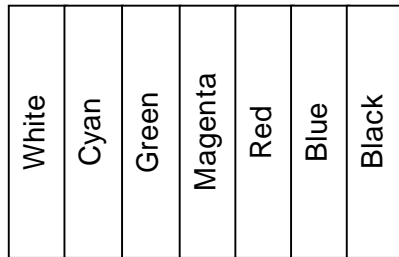


Fig. 5-3

TV color adjustment is achieved by using the luminance control and hue control (not available in so to bring the color bar pattern to the form shown in Fig. 5-3

Circuit adjustment using the color bar patterns are :

TV receivers — Chroma circuit subcarrier color sync. circuit
— Chroma detection circuit
— Matrix circuit.

VTRs — Chroma circuit color sync. circuit
— Low-frequency conversion circuit

(2) Crosshatch pattern

This pattern is used to adjust the dynamic convergence circuit.

It is also used to adjust vertical and horizontal corner color shift and pin-cushion distortion.

(see Fig 5-4)

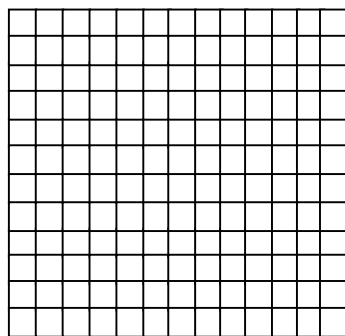


Fig. 5-4

(3) Dot pattern

This pattern is used to adjust TV receiver static convergence. The color shift of the dot at the center of the screen is corrected using the static convergence magnet. (See Fig 5-5)

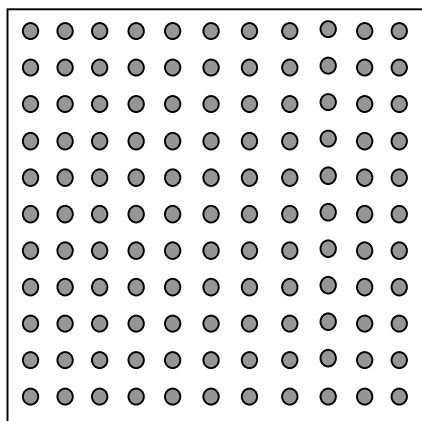


Fig. 5-5

(4) Corner marker pattern

This pattern is used to check whether the polarity is correct when the TV deflection yoke is replaced.

The polarity is correct if the pattern appears in the upper right of the screen. (See Fig. 5-6)

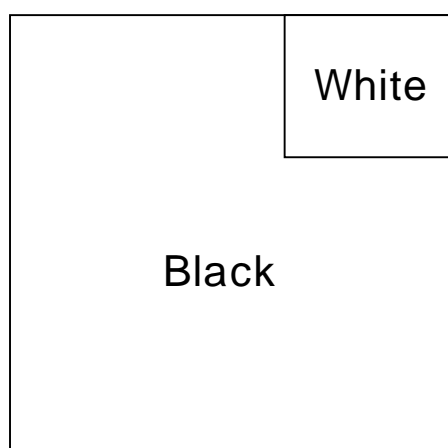


Fig. 5-6

(5) White raster pattern

The white raster pattern is used to adjust the white balance of the TV CRT. Use the red/blue brightness adjustment to adjust until the screen turns white. (See Fig. 5-7)

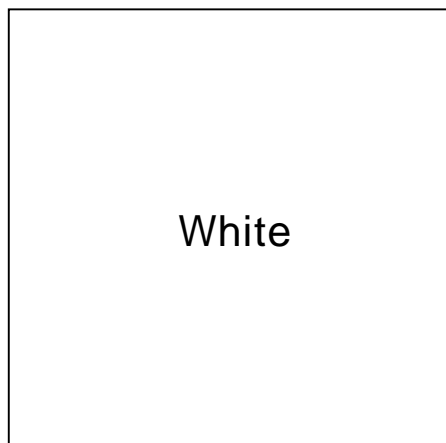
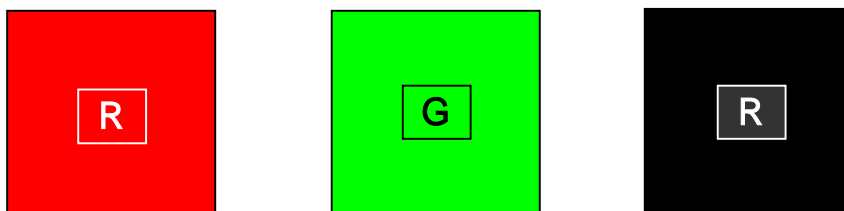


Fig. 5-7

(6) Red, green, and blue raster patterns

These raster patterns are used to adjust the TV color purity. Actual adjustments are performed using the red raster. Use the color purity magnet to adjust until the screen becomes red. Then move the deflection yoke back and forth until the entire screen becomes red. Set the pattern to green or blue raster and check if the screen becomes blue or green.



5-4. SOUND SIGNAL CIRCUIT INSPECTION

A 1KHz sound signal is used to FM modulate the IF sound signal and output it with the RF signal to execute sound circuit inspection of TVs or VTRs. Perform sound circuit inspection using this RF signal.

The sound modulation level is approximately $\pm 25\text{KHz}$.

A Sound signal of 1KHz will be heard from the speakers if the TV or VTR sound circuit is operating normally.

Model	System	Sound Carrier Frequency
PG-401	NTSC M.M	4.5MHz FM
PG-401L	C : PAL B.G	5.5MHz FM
	D : PAL D.K	6.5MHz FM

6. MAINTENANCE

The ASIC and chip components used in the PG-401/PG-401L make it light and compact. However, this also makes it difficult for the user to repair the PG-401/PG-401L in the very rare case of a breakdown.

If this happens, contact your sales representative.

