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1. Introduction

This step by step manual will guide you through the process to complete the assembly and testing of the Video Pattern Generator. Since this unit has a number of options, you may need to skip certain steps, depending on the options ordered.

2. Unpacking

The kit is packaged in the order that the assembly is recommended. Each assembly block has it's associated parts bag. Only open a parts bag when called for during assembly to avoid misplacing parts.

The parts bag could be partially filled depending on the option ordered.

2.1. Main Board Parts List

Remove the parts from the main bag and separate each individual parts bags.

BAG/ ITEM	QTY	REFDES	PART NO.	DESCRIPTION	VALUE
BAG # 1					
01A	26 (11)	C1,C2,C3,C4	MOU_581- UDW104M1	CAP MONO CERAMIC	0.1UF
01B		C5,C6,C7,C8			
01C		C9,C11,C12			
01D		C14,C15,C16			
01E		(C18,C20)			
01F		C23,(C24,C25)			
01G		(C26,C33)			
01H		(C34,C36)			
01I		(C39,C40,C41)			
TOTAL	26 (11)				
BAG # 2					
02A	2	C10,C55	DGK_P2034-ND	CAP EL TANT 16V	2.2UF
02B	3 (1)	C13,C17,(C19)	DGK_P2040-ND	CAP EL TANT 16V	22UF
02C	2 (2)	(C32,C43)	DGK_P2042-ND	CAP EL TANT 16V	47UF
TOTAL	7 (3)				
BAG # 3					
03A	3 (1)	C46,C47,(C48)	DGK_P4805-ND	CAP MCER COG	270PF
03B	3 (1)	C49,C50,(C51)	DGK_P4841-ND	CAP MCER COG	22PF
03C	3 (1)	C52,(C53),C54	DGK_P4806-ND	CAP MCER COG	330PF
TOTAL	9 (3)				
BAG # 4					
04A	3 (1)	L4,L5,(L6)	DGK_M8016-ND	INDUCTOR	1.8UH
04B	2 (1)	R1,R2	DGK_330QBK-ND	RES 1/4W 5%	330
04C	5 (1)	R3,R4,R7, (R22),R32	DGK_10KQBK-ND	RES 1/4W 5%	10K

TOTAL 10 (3)

BAG # 5

05A	7 (1)	R5,R6,R8,R9	DGK_51QBK-ND	RES 1/4W 5%	51
05B		R10,R12,(R14)			
05C	1 (1)	(R24)	DGK_110QBK-ND	RES 1/4W 5%	110
TOTAL	8 (2)				

BAG # 6

06A	1	R36	DGK_470QBK-ND	RES 1/4W 5%	470
06B	3 (1)	R30,R31,(R37)	DGK_75XBK-ND	RES 1/4W 1%	75.0
TOTAL	4 (1)				

BAG # 7

07A	1	R35	DGK_3329P-203-ND	RES VARIABLE	1K
07B	1 (1)	(D8)	DGK_1N4001GICT-ND	DIODE	1N4001
07C	4	RN1,RN2,RN3	DGK_4610X-1-103-ND	RES_PACK10	10K
07D		RN4			
TOTAL	6 (1)				

BAG # 8

08A	1	J4	DGK_CP-2240-ND	SVHSCONN	SVHSCONN
08B	1 (1)	(J3)	DGK_ARF1177-ND	BNC	BNC
08C	1 (1)	(PS1)	DGK_CP-002A-ND	POWER CONN. 2.1MM	PWRCONN_2.1MM
08D	1 (1)	(VR1)	DGK_LM340T-5.0-ND	VOLTAGE REGULATOR 5V	LM340T
08E	1 (1)			SCREW 6-32x1/4	
08F	1 (1)			NUT 6-32	
08G	1 (1)	(L1)	DGK_M5806-ND	INDUCTOR	10UH
08H	1 (1)	(L2)	DGK_P9820-ND	FERRITE BEAD	
TOTAL	8 (7)				

BAG # 9

09A	2	X4, X15	DGK_A9308-ND	SOCKET IC DIP8-300	
09B	3	X2, X3, X5	DGK_A9320-ND	SOCKET IC DIP20-300	
09C	2	X1,X9	DGK_A9328-ND	SOCKET IC DIP28-600	
09D	2	X10,X12	DGK_A2122-ND	SOCKET PLCC 44P	PLCC44 PSOC
09E	1 (1)	(X14)	DGK_A2124-ND	SOCKET PLCC 68P	PLCC68 PSOC
09F	2 [1]	LED1,LED2	JAM_104256	LED CIRCUIT BRD	GREEN
09H	5 [1]	SW1, SW2, SW3 SW4, SW5	DGK_EG1839-ND	SWITCH MOMENTARY	SPST
TOTAL	13 (1)				

BAG #

10

10A	1	U5	GEK_444-245-01	GENERIC ARRAY LOGIC GAL16V8	
10B	2	U2,U3	JAM_45671	MC74HC245A	BUS_XC VR
10C	1	U1	GEK_444-000-01	MC68HC705P9	MCU8BI T
10D	1	U4	DGK_MAX699CPA- ND	MAX699CPA	MAX699
10E	1	U9	MS6224CLL-70PC	IC STATIC RAM	SRAM8K X8

TOTAL 6

BAG #

11

11A	1	U10	GEK_444-952-01	ADRCTRL1	ADRCT RL1
11B	1	U12	GEK_444-953-01	MEMCTRL1	ADRCT RL1
11C	1 (1)	(U14)	MAR_BT866KPJ	BT866KPJ	ENCOD ER
11D	1 (1)	(U15)	DGK_SE1817-ND	OSC27MHZ	OSC27M HZ

TOTAL 4 (2)

12A	1 (1)	(T1)	DGK_T405-ND	XFRMR PLUG IN
13A	1 (1)		GEK_81-970831	PCB MAIN BOARD

BAG #
15

		Standard Patterns	STD Option 1	
--	--	----------------------	--------------	--

15A	1	U1	GEK_444-1XX-01	MC68HC705P9	MCU8BI T
15B	1	U9	MS62256CLL-70PC	MS62256	SRAM32 KX8
15C	1	U6	DGK_93C46/9-ND	93C46	1KSEEP ROM

BAG #
16

		Enhanced Patterns	Option 2	
--	--	----------------------	----------	--

16A	1	U1	GEK_444-X2X-01	MC68HC705P9	MCU8BI T
16B	1	U7	GEK_444-344-01	Y PATTERN EPROM	EPROM 32KX8
16C	1	U8	GEK_444-345-01	UV PATTERN EPROM	EPROM 32KX8
16D,E	2	X7,X8	DGK_A9328-ND	SOCKET DIP28- 600	

BAG #
17

		On Screen Display	Option 3	
--	--	----------------------	----------	--

17A	1	U1	GEK_444-XX3-01	MC68HC705P6	MCU8BI T
-----	---	----	----------------	-------------	-------------

17B	1	U11	MAR_UPD6543CY-001	UPD6453	OSD
17C	1	J2	DGK_CP-2350-ND	JKDIN5	DIN5PS

BAG #
20 Audio Oscillator Option 4

20A	5	C22,C28,C35	MOU_581-UDW104M1	CAP MONO CERAMIC	0.1UF
20B		C42,C45			
20C	1	C37	DGK_P2040-ND	CAP EL TANT 16V	22UF
TOTAL	6				

BAG #
21

21A	1	C21	DGK_P2040-ND	CAP EL TANT 16V	10UF
21B	2	C27,C29	DGK_P4812-ND	CAP MONO CERAMIC	1000PF
21C	1	C30	DGK_P2042-ND	CAP EL TANT 16V	47UF
21D	1	C31	DGK_P4675-ND	CAP MONO CERAMIC	1UF
TOTAL	5				

BAG #
22

22A	1	L3	DGK_DN7431-ND	IND375	330UH
22B	3	D1,D2,D6	DGK_1N4148CT-ND	DIO400-100	1N4148
22C	1	R15	DGK_VALQBK-ND	RES 1/4W 1%	2.0K
TOTAL	5				

BAG #
23

23A	2	R16,R17	DGK_VALQBK-ND	RES 1/4W 1%	20K
23B	2	R18,R19	DGK_VALQBK-ND	RES 1/4W 1%	158K
23C	1	R11	DGK_VALQBK-ND	RES 1/4W 1%	9.53K
TOTAL	5				

BAG #
24

24A	1	R13	DGK_VALQBK-ND	RES 1/4W 5%	43K
24B	1	R20	DGK_VALQBK-ND	RES 1/4W 1%	6.81K
24C	3	R21,R23,R26	DGK_VALQBK-ND	RES 1/4W 5%	10K
TOTAL	5				

BAG #
25

25A	2	R27,R28	DGK_VALQBK-ND	RES 1/4W 1%	4.99K
25B	1	R29	DGK_VALQBK-ND	RES 1/4W 1%	3.01K
25C	2	R33,R34	DGK_VALQBK-ND	RES 1/4W 1%	24.9
TOTAL	5				

BAG #
26

26A	2	C38,C44	DGK_P4846-ND	CAP MONO CER COG	56PF
26B	1	Q1	DGK_2N5457-ND	TRANSISTOR FET	NJFET 2N5457

26C	1	R25	DGK_3329P-203-ND	RES VARIABLE	20K
TOTAL	4				

BAG #
27

27A	1	U16	DGK_MAX635ACPA -ND	MAX635	DCTOD C_CON V
27B	1	U13	ALL_TL062N	OP AMP TL062	TL062N
27C	1	U17	ALL_LM833N	OP AMP LM833	LM833N
27D	3	X13, X16, X17	DGK_A9308-ND	SOCKET IC DIP8- 300	
TOTAL	3				

28A 1 J1 MOU_568-NC3MAH CONNECTOR XLR
NC3MAH

29A 1 GEK_85-19216 ENCLOSURE

Part No. Prefix Source Codes:	Company	Telephone
ALL	Allied Electronics	1-800-433-5700
MOU	Mouser Electronics	1-800-346-6873
DGK	Digikey Corp	1-800-344-4539
JAM	JameCo Electronics	1-800-831-4242
MAR	Marshall Electronics	1-800-432-2223
GEK	GekCo	1-425-392-0638

3. Assembly Notes

TOOLS

You will need these tools to assemble your kit.

Diagonal Cutters

Needle Nose Pliers

Flat Head Screwdriver

Philips Screwdriver (for the enclosure only)

Pencil Soldering Iron (22 to 25 WATTS)

ASSEMBLY

1. Follow the instructions carefully. Read the entire step before you perform each operation.
2. Refer to the Pictorial and Detail Illustrations for help in performing the assembly steps. The illustrations are arranged in the proper sequence, as called for in the steps.
3. Pictorials show the overall operation for a group of assembly steps: Details generally illustrate a single step. When you are directed to refer to a certain Pictorial "for the following steps," continue using that Pictorial until you are referred to another Pictorial for another group of steps.
4. Position all parts as shown in the Pictorials.
5. Solder instructions are generally given only at the end of a series of similar steps. You may solder more often if you desire.
6. Each circuit part in an electronic kit has its own component number (R3, C8, etc.). Use these numbers when you want to identify the same part in the various sections of the Manual. These numbers, which are especially useful if a part has to be replaced, appear:

In the Parts List,

At the beginning of each step where a component is installed,

In some illustrations,

In the Schematic,

In the sections at the rear of the Manual.

SAFETY WARNING: Avoid eye injury when you cut off excessive lead lengths. Wear safety glasses or goggles and hold the leads so they cannot fly toward your eyes.

SOLDERING

Soldering is one of the most important operations you will perform while assembling your kit. A good solder connection will form an electrical connection between two parts such as a component lead and a circuit board foil. A bad solder connection could prevent an otherwise well-assembled kit from operating properly.

It is easy to make a good solder connection if you follow a few simple rules:

Use the right type of soldering iron. A 22 to 25-watt pencil soldering iron with a 1/8" or 3/16" chisel or pyramid tip works best.

Keep the soldering iron tip clean. Wipe it often on a wet sponge or cloth: then apply solder to the tip to give the entire tip a wet look. This process is called tinning, and it will protect the tip and enable you to make good connections. When solder tends to "ball" or does not stick to the tip, the tip needs to be cleaned and retinned.

NOTE: Always use rosin core, radio-type solder (60:40 tin-lead content) for all of the soldering in this kit. The Warranty will be void and we will not service any kit in which acid core solder or paste has been used.

As mentioned earlier, the design is modular, so depending on the required functionality, you can build as much or as little as you want.

The minimal configuration is a basic video generator that creates NTSC color black video. This version can be constructed with just the parts on the Video Encoder and Power Supply schematic plus the oscillator on the Memory Control schematic.

The parts list identifies the parts needed for the color black version, called (Basic Unit), by parenthesizes surrounding the part quantities and reference designators. The assembly instruction check off that pertain to the color black version are bracketed as shown [()]. If you are building the color black version only, perform just the steps that are enclosed in the brackets. Other optional steps are noted by an asterisk (*) and the steps can be skipped if that option is not desired.

To create SMPTE bars and Black you need to assemble all the components listed in the main parts list (Standard Unit), and all steps without an asterisk in the assembly instructions. This includes the schematics of the Microcontroller, SRAM Memory and Memory Control.

For more patterns add the Enhanced Pattern EPROM's. The On Screen Display and Audio Oscillator can be added or not, in any combination to set up the desired system configuration. The only caution in this flexible configuration is that the correct microcontroller needs to be matched to the system configuration.

The pictorial diagrams are conveniently placed in the rear of the manual so that they can be removed and referred to for each assembly step.

4. Main Circuit Board

4.1. Step-By-Step Assembly

Refer to Pictorial 1-1 for the following steps.

Open Bag # 1

Position the main circuit board with the component side facing up as shown.

Install the decoupling capacitors.

C5: 0.1 uF (104) radial-lead ceramic capacitor.

C1: 0.1 uF (104) radial-lead ceramic capacitor.

C2: 0.1 uF (104) radial-lead ceramic capacitor.

C4: 0.1 uF (104) radial-lead ceramic capacitor.

C3: 0.1 uF (104) radial-lead ceramic capacitor.

C6: 0.1 uF (104) radial-lead ceramic capacitor.

* Skip the next 2 steps if option 2 (Enhanced Patterns) is NOT used.

* C7: 0.1 uF (104) radial-lead ceramic capacitor.

* C8: 0.1 uF (104) radial-lead ceramic capacitor.

C9: 0.1 uF (104) radial-lead ceramic capacitor.

C11: 0.1 uF (104) radial-lead ceramic capacitor.

C12: 0.1 uF (104) radial-lead ceramic capacitor.

C14: 0.1 uF (104) radial-lead ceramic capacitor.

C15: 0.1 uF (104) radial-lead ceramic capacitor.

C23: 0.1 uF (104) radial-lead ceramic capacitor.

C16: 0.1 uF (104) radial-lead ceramic capacitor.

C39: 0.1 uF (104) radial-lead ceramic capacitor.

C40: 0.1 uF (104) radial-lead ceramic capacitor.

C25: 0.1 uF (104) radial-lead ceramic capacitor.

C18: 0.1 uF (104) radial-lead ceramic capacitor.

C20: 0.1 uF (104) radial-lead ceramic capacitor.

C33: 0.1 uF (104) radial-lead ceramic capacitor.

C41: 0.1 uF (104) radial-lead ceramic capacitor.

C34: 0.1 uF (104) radial-lead ceramic capacitor.

C26: 0.1 uF (104) radial-lead ceramic capacitor.

C24: 0.1 uF (104) radial-lead ceramic capacitor.

C36: 0.1 uF (104) radial-lead ceramic capacitor.

Solder the leads to the foil and cut off the excess lead lengths.

Refer to Pictorial 1-2 for the following steps.

*Skip the next 5 steps if option 4 (Audio Oscillator) is NOT used.

* () Open Bag # 20

* () C42: 0.1 uF (104) radial-lead ceramic capacitor.

* () C22: 0.1 uF (104) radial-lead ceramic capacitor.

* () C28: 0.1 uF (104) radial-lead ceramic capacitor.

* () C35: 0.1 uF (104) radial-lead ceramic capacitor.

* () C45: 0.1 uF (104) radial-lead ceramic capacitor.

NOTE: Before you install an electrolytic capacitor, look at it and identify the leads. One lead will have either a negative (-) mark or a positive (+) mark near it on the side of the capacitor. (For Aluminum Electrolytics the marking for a negative lead may look like an oblong bar, sometimes with a circle around it, inside an arrow.) Be sure to install the positive lead in the positive-marked hole. **On the tantalum electrolytics the positive lead is longer than the negative lead.**

() Open Bag # 2

() C10: 2.2 uF (2.2) radial-lead tantalum electrolytic capacitor.

() C55: 2.2 uF (2.2) radial-lead tantalum electrolytic capacitor.

() C17: 22 uF (22) radial-lead tantalum electrolytic capacitor.

[()] C19: 22 uF (22) radial-lead tantalum electrolytic capacitor.

() C13: 22 uF (22) radial-lead tantalum electrolytic capacitor.

*Skip the next 4 steps if option 4 (Audio Oscillator) is NOT used.

*Bag # 20 cont.

* () C37: 22 uF (22) radial-lead tantalum electrolytic capacitor.

* () Open Bag # 21

* () C21: 10 uF (10) radial-lead tantalum electrolytic capacitor.

* () C27: 1000 pF (102) radial-lead ceramic capacitor.

* () C29: 1000 pF (102) radial-lead ceramic capacitor.

* () C30: 47 uF (47) radial-lead tantalum electrolytic capacitor.

* () C31: 1 uF (105) radial-lead ceramic capacitor.

Bag # 2 cont.

[()] C32: 47 uF (47) radial-lead tantalum electrolytic capacitor.

[()] C43: 47 uF (47) radial-lead tantalum electrolytic capacitor.

() Open Bag # 3

() C46: 270 pF (271) radial-lead ceramic capacitor.

() C47: 270 pF (271) radial-lead ceramic capacitor.

[()] C48: 270 pF (271) radial-lead ceramic capacitor.

() C49: 22 pF (220) radial-lead ceramic capacitor.

() C50: 22 pF (220) radial-lead ceramic capacitor.

[()] C51: 22 pF (220) radial-lead ceramic capacitor.

() C54: 330 pF (331) radial-lead ceramic capacitor.

() C52: 330 pF (331) radial-lead ceramic capacitor.

C53: 330 pF (331) radial-lead ceramic capacitor.

Solder the leads to the foil and cut off the excess lead lengths.

Refer to Pictorial 1-3 for the following steps.

Open Bag # 4

L4: 1.8 uH 10% (brn-gold-viol-silver) axial-lead inductor.

L5: 1.8 uH 10% (brn-gold-viol-silver) axial-lead inductor.

L6: 1.8 uH 10% (brn-gold-viol-silver) axial-lead inductor.

R1: 330 Ω (org-org-brn) resistor.

*Skip the next marked step if the OSD option 3 is not desired.

* R2: 330 Ω (org-org-brn) resistor.

R3: 10 k Ω (brn-blk-org) resistor.

R7: 10 k Ω (brn-blk-org) resistor.

R4: 10 k Ω (brn-blk-org) resistor.

R22: 10 k Ω (brn-blk-org) resistor.

R32: 10 k Ω (brn-blk-org) resistor.

Open Bag # 5

R5: 51 Ω (grn-brn-blk) resistor.

R6: 51 Ω (grn-brn-blk) resistor.

R9: 51 Ω (grn-brn-blk) resistor.

R10: 51 Ω (grn-brn-blk) resistor.

R8: 51 Ω (grn-brn-blk) resistor.

R14: 51 Ω (grn-brn-blk) resistor.

R12: 51 Ω (grn-brn-blk) resistor.

R24: 110 Ω (brn-brn-brn) resistor.

Open Bag # 6

R36: 470 Ω (yel-viol-brn) resistor

R30: 75 Ω 1% (violet-grn-blk-silver) resistor.

R31: 75 Ω 1% (violet-grn-blk-silver) resistor.

R37: 75 Ω 1% (violet-grn-blk-silver) resistor.

Open Bag # 7

R35: 1k Ω variable resistor.

Solder the leads to the foil and cut off the excess lead lengths.

NOTE: When you install a diode, always match the band on the diode with the band mark on the circuit board. The circuit will not work properly if a diode is installed backwards.

If your diode has a solid body, the band is clearly defined. If your diode has a glass body, do not mistake the colored end inside the diode for the banded end. Look for a band painted on the outside of the glass. The diode may not be the same size as the screen on the circuit board.

DO NOT INSTALL D7:

D8: 1N4001 diode.

RN1: 10 k Ω 103 resistor pack. Remember to position the end with the dot or line towards the "square pad" and tapered outline on the circuit board. After you install a resistor pack and the pins are fully seated in their holes, solder the pins to the foil.

RN2: 10 k Ω 103 resistor pack.

RN3: 10 k Ω 103 resistor pack.

RN4: 10 k Ω 103 resistor pack.

*Skip the next 2 steps if option 4 (Audio Oscillator) is not used.

- * () Open Bag # 22
- () D6: 1N4148 diode.
- * () L3: 330uH axial-leaded power inductor.

NOTE: When you install each of the following connectors, position the connector body with the tab as shown and insert the pins into the circuit board holes. Press the connector flat against the board and then turn the board over and solder the pins to the foil side. Make sure that the body remains flat against the board.

- () Open Bag # 8
- () J4: S-VHS 4-pin mini-din connector.
- [()] J3: Composite video 75 connector.
- [()] PS1: 2.1mm power connector.
- [()] VR1: 7805 regulator IC. Install with 6-32 x 1/4 round head screw and 6-32 nut. Insert the screw through the bottom of the board.
- [()] L1: 10uH axial-leaded power inductor.
- [()] L2: Ferrite Bead power inductor.
- () Open Bag # 9

Install IC sockets.

Be sure to align the sockets with the outline on the board. The PLCC sockets have a flat corner which must align with the flat corner on the silkscreen outline.

- () X2, X3, X5: 20 pin DIP sockets.
- [()] X14: 68 pin PLCC socket.

Skip to Circuit Board Checkout Section if the Basic Option Only is desired.

- () X1: 28 pin DIP socket.
- *Skip the next 2 steps if option 2 (Enhanced Patterns) is not used.
- * () X7: 28 pin DIP socket.

- * () X8: 28 pin DIP socket.
- () X9: 28 pin DIP socket.
- () X4: 8 pin DIP socket.
- () X15: 8 pin DIP socket.
- () X10: 44 pin PLCC socket.
- () X12: 44 pin PLCC socket.
- [()] LED1: green LED.
- *Skip the marked steps if the OSD option 3 is not desired.

- * () X11: 20 pin DIP socket.
- * () LED2: green LED.

Make sure the switches are fully seated against the circuit board so there will be no alignment problems with the front panel.

- * () SW1: momentary switch.
- Only install SW2 for the SMPTE Bar and black option.
- () SW2: momentary switch.
- () SW3: momentary switch.
- () SW4: momentary switch.
- () SW5: momentary switch.

*Skip to Circuit Board Checkout if option 4 (Audio Oscillator) is NOT used.

Refer to Pictorial 1-4 for the following steps.

*Audio Oscillator Section

- * () Open Bag # 27
- * () X13: 8 pin DIP socket.
- * () X17: 8 pin DIP socket.
- * () X16: 8 pin DIP socket.
- * () Open Bag # 22

- * () R15: 2 k Ω (red-blk-red) resistor.
- * () D1: 1N4148 diode.
- * () D2: 1N4148 diode.
- * () Open Bag # 23
- * () R16: 20 k Ω (red-blk-org) resistor.
- * () R17: 20 k Ω (red-blk-org) resistor.
- * () R18: 158 k Ω 1% (brn-grn-gray-org) resistor.
- * () R19: 158 k Ω 1% (brn-grn-gray-org) resistor.
- * () R11: 9.53 k Ω 1% (white-grn-org-brn) resistor.
- * () Open Bag # 24
- * () R13: 43 k Ω 1% (yel-org-blk-red) resistor.
- * () R20: 6.81 k Ω 1% (blu-gray-brn-brn) resistor.
- * () R23: 10 k Ω (brn-blk-org) resistor.
- * () R21: 10 k Ω (brn-blk-org) resistor.
- * () R26: 10 k Ω (brn-blk-org) resistor.
- * () Open Bag # 25
- * () R27: 4.99 k Ω 1% (yel-white-white-brn) resistor.
- * () R28: 4.99 k Ω 1% (yel-white-white-brn) resistor.
- * () R29: 3.01 k Ω 1% (org-blk-brn-brn) resistor.
- * () R33: 24.9 Ω 1% (red-yel-white-gold) resistor.
- * () R34: 24.9 Ω 1% (red-yel-white-gold) resistor.
- * () Open Bag # 26

* () C44: 56 pF (560) radial-lead ceramic capacitor.

* () C38: 56 pF (560) radial-lead ceramic capacitor.

NOTE: When you install the following transistor be to position it so the flat of the case is over the flat outlined on the circuit board.

* () Q1: 2N5457 transistor.

* () R25: 20k Ω variable resistor.

() Solder the leads to the foil and cut off the excess lead lengths. Be carefull that the pads between R20 and R23 are **NOT** shorted.

CIRCUIT BOARD CHECKOUT

Carefully inspect the circuit board for the following problems.

- () Unsoldered connections.
- () Poor solder connections.
- () Solder bridges between foil patterns.
- () Protruding leads which could touch together.

Refer to the illustration where the parts were installed as you make the following visual checks.

- () Transistors and IC's for the proper type and installation.
- () Diodes for the proper type and positioning of the banded end.
- () Electrolytic capacitors for the correct position of the positive (+) or a negative (-) marked ends.

5. Initial Tests

Before installing the IC's perform the following tests.

Using a multi-meter to measure resistance perform the following checks.

() Verify that the resistance with the positive lead on U5 pin 20 and negative lead on pin 10, is greater than 2k ohms.

() Connect the plug in transformer T1 to power connector PS1 and plug into a wall outlet and verify that the voltage with the positive lead on U5 pin 20 and negative lead on pin 10, is 5V.

() Disconnect the plug in transformer T1 and set aside for later.

IC INSTALLATION.

NOTE: You will install the following IC's on the main circuit board.

CAUTION: Integrated circuits (IC's) are complex electrical devices that perform many complicated operations in a circuit. These devices can be damaged during installation. Read all of the following information before you install the IC's.

Some of the IC's you will install in the following steps are MOS {metal oxide semiconductor} devices. Be sure they do not get damaged by static electricity. Once you remove the IC from the foam pad, **do not let go of it** or lay it down until it is in its socket. Install it as follows. Read all of the following steps before you pick up an IC.

1. Pick up the IC and touch the foam pad with both hands.
2. Hold the foam pad with one hand and remove the IC with the other hand.
3. Continue to hold the IC with the one hand and straighten any bent pins with the other hand.
4. The pins on the IC's may be bent out at an angle as shown in A, and if this is the case, they will not line up with the holes in the IC socket or circuit board pads. Lay the IC down on its side as shown in B and very

carefully roll it toward the pins to bend the lower pins into line. Then turn the IC over and bend the pins on the other side in the same manner. Do not try to install and IC without first bending the pins as described. To do so may damage the IC pins or the socket, causing an intermittent contact.

Install the IC's on the main circuit board:

- () Open Bag # 10
- () U5: GAL16V8 IC.
- () U2: 74HC245 IC.
- () U3: 74HC245 IC.
- () U1: MC68HC705P9 IC (#444-XXX).
- () U4: MAX699ACPA IC.
- () U9: 6264 (Standard Patterns) or 62256 (Enhanced Patterns) SRAM IC.
- *Skip the marked steps if the Enhanced Patterns option 2 is not desired.
- *() U6: 93C46 IC.
- *() U7: 27HC256 (#444-344-01) Y data IC.
- *() U8: 27HC256 (#444-345-01) UV data IC.
- () U10: ISPLSI2032 (#444-952-01) ADRCTRL IC.
- () U12: ISPLSI2032 (#444-953-01) MEMCTRL IC.
- [[()]] U14: BT866KPJ ENCODER IC.
- [[()]] U15: SE1817 27MHz OSC IC.
- *Skip to "Initial Tests" Section if the Basic Option Only is desired (No OSD or Audio Oscillator).
- () Open Bag # 27
- *() U16: MAX635 DC to DC Conv IC.
- *() U13: TLO62 IC.

* () U17: LM833 IC.

* () Open Bag # 28

* () J1: Audio XLR male connector.

* () Open Bag # 17

* () J2: Keyboard 5 pin Din connector.

* () U11: uPD6453 IC.

This completes the assembly of the printed circuit board.

NOTE: If the complete assembly is performed, there will be three parts missing, D7, CN1 and SW6. These parts are not necessary for normal operation.

Vp-p) output level using a AC rms voltmeter or an Oscilloscope.

6. Final Tests

Using a multi-meter to measure resistance perform the following checks.

() Verify that the resistance with the positive lead on U5 pin 20 and negative lead on pin 10, is greater than 2k ohms.

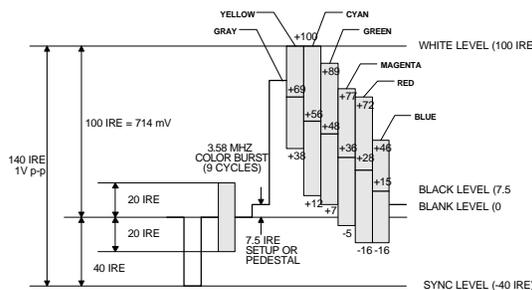
() Connect the plug in transformer T1 to power connector PS1 and plug into a wall outlet and verify that the voltage with the positive lead on U5 pin 20 and negative lead on pin 10, is 5V.

() Connect a monitor to either the composite video output J3 or the S-VHS output J4 and you should see the color bars or the window pattern.

7. Calibration

Output Video Level Adjustment

Terminate the composite video output into a 75 ohm load and measure the video output level using the SMPTE bar pattern. Adjust R35 for a 1V p-p output level from the negative edge of sync to the peak white bar as shown in Figure 1.



• Figure 1: SMPTE Bars

Output Audio Level Adjustment

Terminate the audio output into a 600 ohm load and adjust R25 for 0 dbu (.775 VAC rms or 2.2

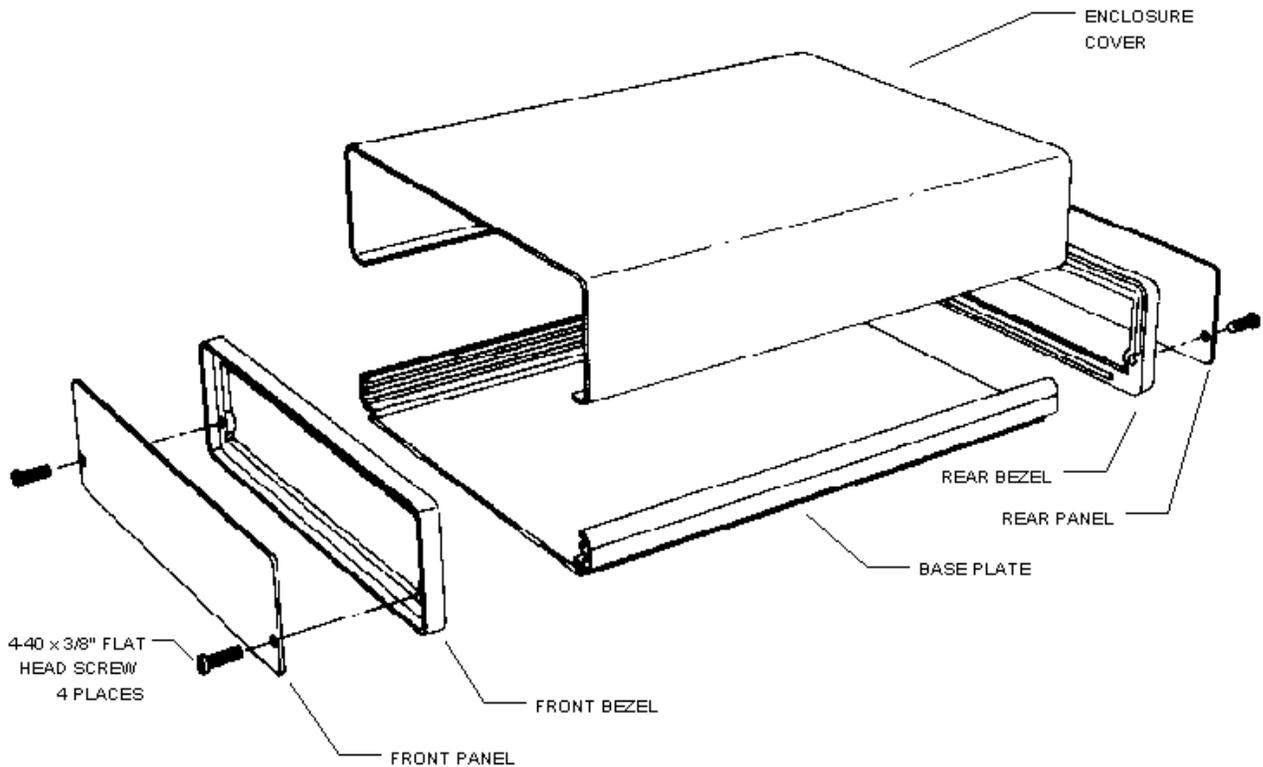
8. In Case Of Difficulty

The “Visual Checks” that are provided below will help you locate any difficulties that might occur during the assembly and testing of your Video Pattern Generator. Additional “ In Case of Difficulty” information is also provided in your Operation Manual.

In an extreme case where you are unable to resolve a difficulty, refer to the “Customer Service” information at the back of the Manual.

VISUAL CHECKS

1. The majority of kits that fail are due to poor solder connections. Therefore, you can eliminate many difficulties by carefully inspecting each connection to make sure it is soldered as described in the solder instructions section. Reheat any doubtful connections.
2. Check the circuit board to be sure there are no solder bridges between adjacent connections.
3. Check capacitor values carefully. Be sure the proper value part is installed at each capacitor location and that the negative (-) mark or a positive (+) mark is oriented correctly.
4. Check each resistor value carefully. A resistor that is discolored, cracked, or shows signs of bulging is faulty and must be replaced.
5. Be sure the correct diode is installed at each location, and that the banded end is positioned correctly.
6. Check the orientation and the correct part number of the Integrated Circuits. Use the pictorial diagrams as a reference.



• Figure 2: Enclosure Diagram

9. Final Assembly

Skip these steps if the enclosure is not used.

() Unpack the Enclosure which includes a base plate, cover, front and rear panels, front and rear bezels and four 4-40 x 3/8 flat head screws.

() Slide the cover on the base plate using the mating grooves.

() Place the front bezel and front panel on to the cover and base plate and attach using two 4-40 x 3/8" flat head screws.

() Carefully slide the circuit assembly into the enclosure base plate until the front panel switches align and the board is fully seated.

If you have difficulty aligning the switch knobs with the holes slide back the cover and nudge the offending switch knob or loosen the front panel screws to allow good alignment.

Make sure all switches can move freely.

() Place the rear bezel and rear panel on to the cover and base plate and attach using two 4-40 x 3/8" flat head screws.

Congratulations you have successfully completed the assembly of the unit and have a fine piece of equipment you have assembled yourself.

10. CUSTOMER SERVICE

Please provide complete information when you request replacement parts from the factory. Be certain to include the GEKCO part number exactly as it appears in the parts list.

Ordering From The Factory

Print all of the information requested on the parts order form furnished with this product and mail to GEKCO. If you are unable to locate a order form, write us a letter or card including:

- GEKCO part number
- Model Number
- Date of purchase
- Location purchased or invoice number
- Nature of defect
- Your payment or authorization for COD shipment of parts not covered by warranty.

Mail letters to: GEKCO
 PO Box 642
 Issaquah, WA 98027-0642
 Attn: Parts Replacement

TECHNICAL CONSULTATION

Need help with your kit? Self-Service? Construction? Operation? Call or write for assistance. You'll find our Technical Consultants eager to help with just about any technical problem.

The effectiveness of our consultation service depends on the information you furnish. Be sure to tell us:

- The Model number and Series number from the label.
- The date of purchase
- An exact description of the difficulty.

- Everything you have done in attempting to correct the problem.

Also include switch positions, connections to other units, operating procedures, voltage readings, and any other information you think might be helpful.

REPAIR SERVICE

Service facilities are available, if needed, to repair your completed kit. (Kits that have been modified, soldered with paste flux or acid core solder, cannot be accepted for repair.)

When returning your kit to the factory, attach a letter containing the following information directly to the unit.

- Your name and address.
- Date of purchase and invoice number
- Copies of all correspondence relevant to the service of the kit.
- A brief description of the difficulty.
- Authorization to return your kit COD for the service and shipping charges. (This will reduce the possibility of delay).

Check the equipment to see that all screws and parts are secured. Place the equipment in a strong carton with at least THREE INCHES of *resilient* packing material (shredded paper, shipping popcorn, etc.) on all sides. Use additional packing material where there are protrusions (long connectors, large knobs, etc.).

Seal the carton with good quality shipping tape, and mark it "Fragile" on at least two sides. Remember, the carrier will not accept liability for shipping damages if the unit is insufficiently packed. Ship by prepaid express, United Parcel Service, or insured Parcel Post to:

GEKCO
 13019 250th PL SE
 Issaquah, WA 98027-6730

11. Assembly Pictorial Diagrams

- Figure 3: Pictorial 1-1
- Figure 4: Pictorial 1-2

- Figure 5: Pictorial 1-3

- Figure 6: Pictorial 1-4