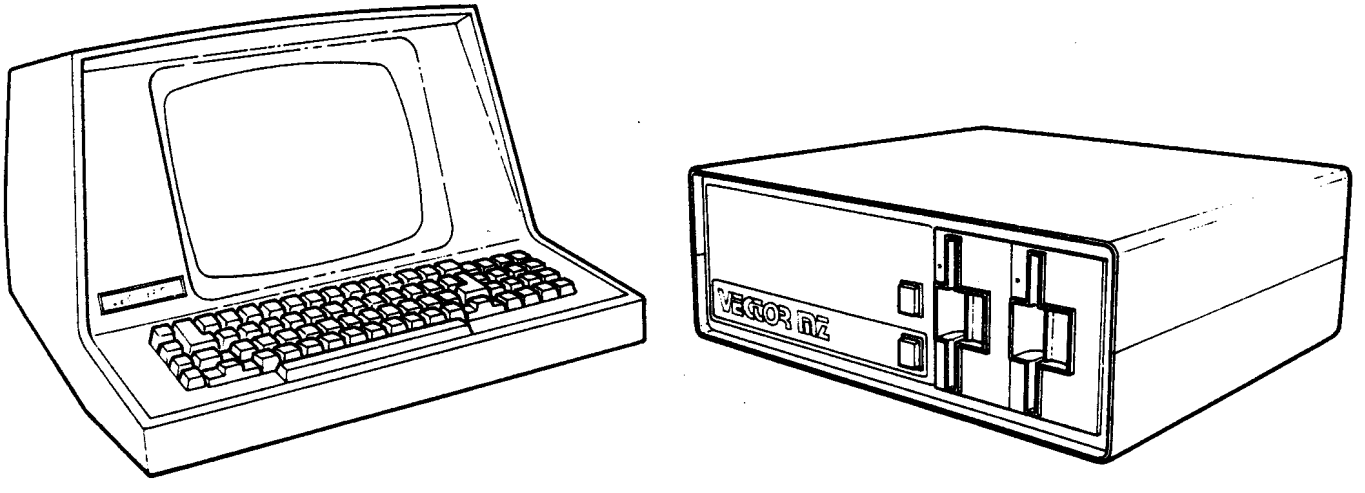
MINDLESS TERMINAL
USERS MANUAL



VECTOR GRAPHIC INC.

VECTOR GRAPHIC MINDLESS TERMINAL

Revision ∅

USERS MANUAL

Revision B of the manual

March 30, 1979

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REPAIR AGREEMENT

The Mindless Terminal sold hereunder is sold "as is", with all faults and without any warranty, either expressed or implied, including any implied warranty of fitness for intended use or merchantability. However, the above notwithstanding, VECTOR GRAPHIC, INC., will, for a period of ninety (90) days following delivery to customer, repair or replace any Mindless Terminal that is found to contain defects in materials or workmanship, provided:

1. Such defect in material or workmanship existed at the time the Mindless Terminal left the VECTOR GRAPHIC, INC., factory;
2. VECTOR GRAPHIC, INC., is given notice of the precise defect claimed within ten (10) days after its discovery;
3. The Mindless Terminal is promptly returned to VECTOR GRAPHIC, INC., at customer's expense, for examination by VECTOR GRAPHIC, INC., to confirm the alleged defect, and for subsequent repair or replacement if found to be in order.

Repair, replacement or correction of any defects in material or workmanship which are discovered after expiration of the period set forth above will be performed by VECTOR GRAPHIC, INC., at Buyer's expense, provided the Mindless Terminal is returned, also at Buyer's expense, to VECTOR GRAPHIC, INC., for such repair, replacement or correction. In performing any repair, replacement or correction after expiration of the period set forth above, Buyer will be charged in addition to the cost of parts the then-current VECTOR GRAPHIC, INC., repair rate. At the present time the applicable rate is $35.00 for the first hour, and $18.00 per hour for every hour of work required thereafter. Prior to commencing any repair, replacement or correction of defects in material or workmanship discovered after expiration of the period for no-cost-to-Buyer repairs, VECTOR GRAPHIC, INC., will submit to Buyer a written estimate of the expected charges, and VECTOR GRAPHIC, INC., will not commence repair until such time as the written estimate of charges has been returned by Buyer to VECTOR GRAPHIC, INC., signed by duly authorized representative authorizing VECTOR GRAPHIC, INC., to commence with the repair work involved. VECTOR GRAPHIC, INC., shall have no obligation to repair, replace or correct any Mindless Terminal until the written estimate has been returned with approval to proceed, and VECTOR GRAPHIC, INC., may at its option also require prepayment of the estimated repair charges prior to commencing work.

Repair Agreement void if the enclosed card is not returned to VECTOR GRAPHIC, INC. within ten (10) days of end consumer purchase.

TABLE OF CONTENTS

I. INTRODUCTION

1.1 SPECIFICATIONS

Screen Size	12-inch diagonal CRT
Resolution	900 lines at center 750 lines at borders
Bandwidth	12 MHz
Video Interface	Separate TTL video and sync
Compatibility of Video	Compatible with Vector Graphic Flashwriters I and II alphanumeric video display boards and most other alphanumeric video display boards Not compatible with Vector Graphic High Resolution Graphics board
Keyboard	Custom 60 keys, typewriter format, 12-key numeric pad, ESC, DEL, ALL CAPS CTRL, LF, and cursor movement keys
Keyboard Electronics	Capacitance key switches and LSI N-channel MOS encoding electronics
External Controls	Contrast
Internal Controls	Vertical hold Height Vertical linearity Vertical centering Focus Brightness Horizontal centering
Power	+16V @ 1.15A +8V @ 0.25A
Power Source	+16V and +8V from mainframe power supply
Cables	Purchased separately: cable to connect terminal to mainframe and to connect inside of mainframe to power, to keyboard port, and to video board

1.2 DESCRIPTION OF THE MINDLESS TERMINAL

The Vector Graphic Mindless Terminal is a high quality terminal that, particularly when used with Vector Graphic video display boards, provides the user with features and versatility not available in other terminals.

The CRT monitor has up to 900 lines resolution and 12 MHZ bandwidth. All elements of the display are adjustable and adjustment procedures may be found later in this manual.

The keyboard is a high reliability unit with capacitive type switches. A numeric keypad and lighted shift lock and ALL CAPS lock keys are standard.

The Mindless Terminal is designed to receive power (+8V and +16V) from the computer power supply. Cables are available (ordered separately) which make these connections quite simple to implement.

The Mindless Terminal requires that the video information be provided at TTL levels as separate video, horizontal sync and vertical sync. This is provided by Vector Graphic alphanumeric video boards.

1.3 DESCRIPTION OF THE MANUAL

This manual provides a complete Users Guide for the Mindless Terminal, including detailed explanations of all the external and internal adjustments possible, and how to connect the terminal to your computer. Complete schematics as well as ASCII and keyboard code charts are included.

II. USERS GUIDE

2.1 EXTERNAL CONTROLS

Operation of the Mindless Terminal is very straightforward. The power to the Mindless Terminal is provided by the computer power supply and is thus switched on and off by the computer power switch.

The only external control is the contrast control located on the rear panel of the Mindless Terminal. This should be adjusted to suit personal preference and ambient light level.

For other adjustments see section on CRT monitor adjustments later in this manual.

2.2 INSTALLATION

In addition to the Mindless Terminal, you must order separately the VMTC cable set, which includes:

1. A 4-foot 25-conductor flat ribbon cable used to interconnect the Mindless Terminal to the computer interface.

2. A signal/power cable assembly, used inside the mainframe chassis, to connect the terminal to power supply and also provide the video signals and receive the keyboard signals.

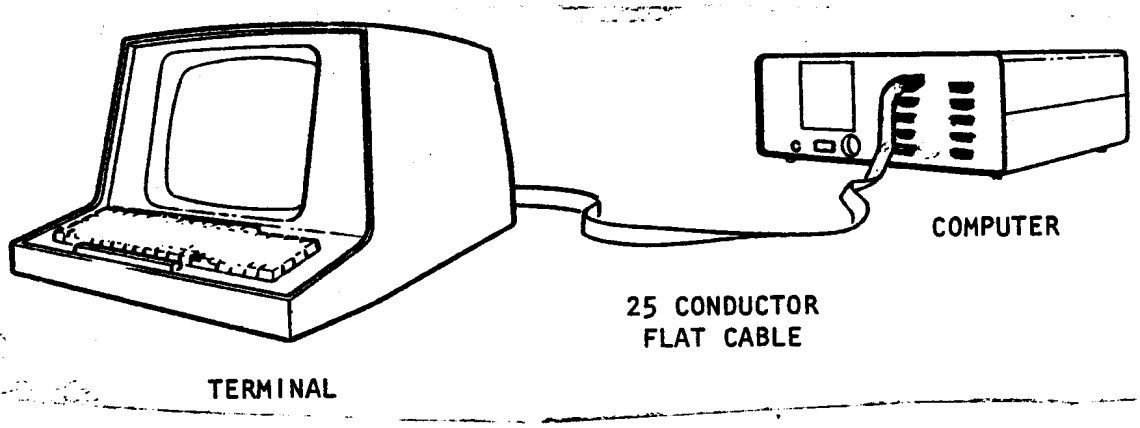


FIGURE 1

The following procedure describes how to connect the Mindless Terminal to Vector Graphic systems (such as the Vector MZ) utilizing a Vector Graphic Flashwriter Video Board and the above mentioned VMTC cable. Wire lists are provided for the user to fabricate custom cables for connection to non-standard devices. Please note that due to the large variations in manufacturer's products, it is impossible for Vector Graphic to provide interface cables for anything other than Vector Graphic products.

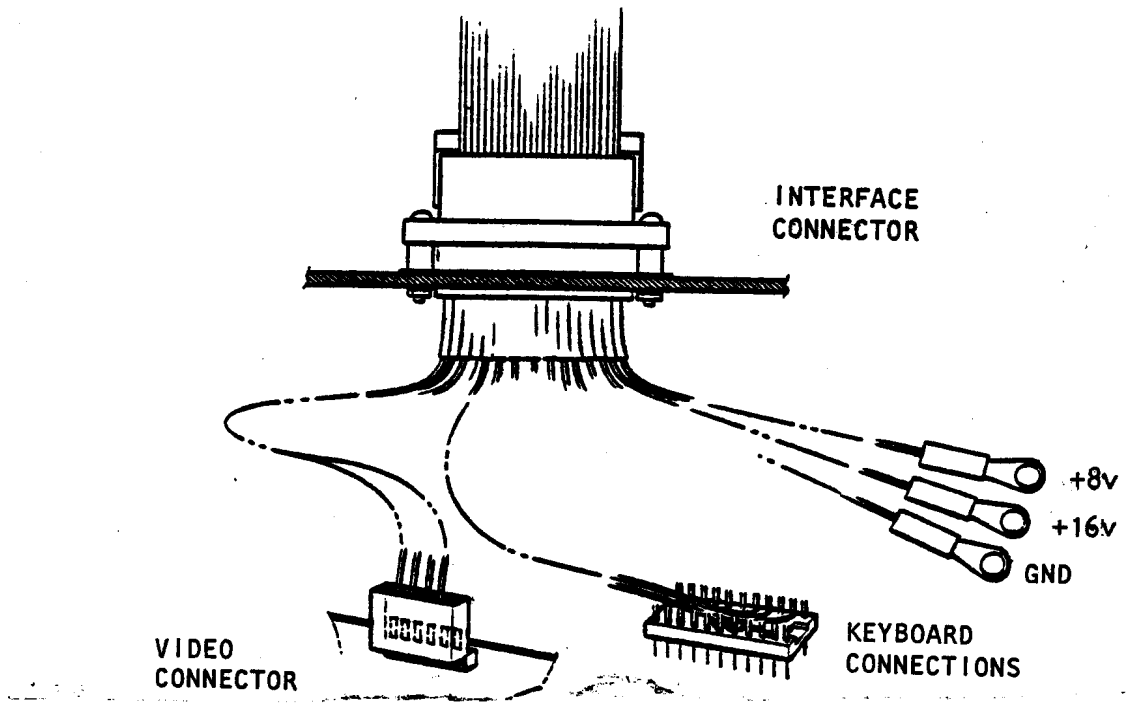


FIGURE 2

1. Before proceding, familiarize yourself with the VMTC cables and this manual.

   Note that the internal cable is divided into four parts: video connector; keyboard connector; power supply connections; and interface connector.

2. Mount the DB-25S Interface Connector in a convienent cutout on the computer chasis backpanel using the hardware supplied.

3. Connect the power terminal lug marked +8V to the +8V terminal on the large filter capacitor (see Figure 3). Verify all of the other terminal lugs are in place and tightened securely.

4. In a likewise manner connect the terminal lugs marked +16V and GND to their respective connection points as shown in Figure 3.

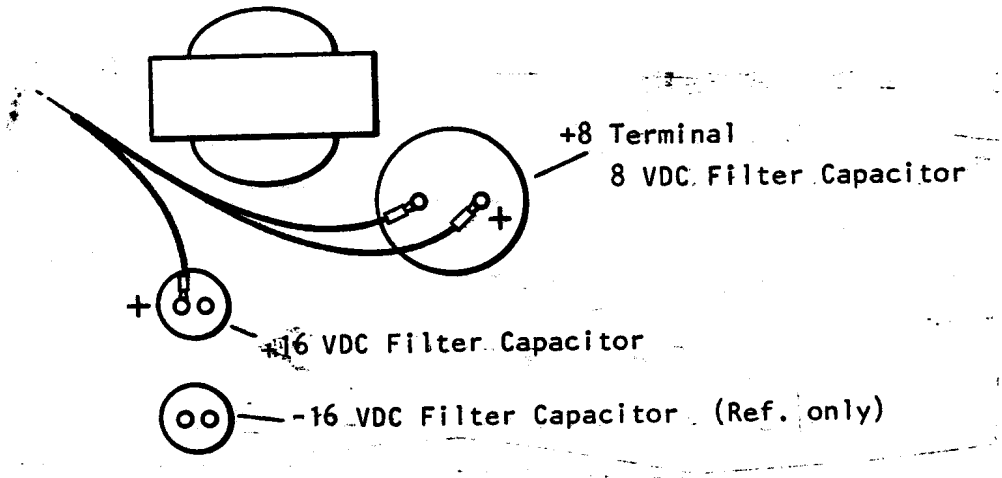


FIGURE 3

WARNING - It is very important that the power connections are made correctly. Failure to provide correct power may result in equipment damage.

5. Install the video board in a motherboard slot near the rear of the computer chassis to permit the video and keyboard cables to be connected to it conveniently.

6. Plug in the 24 pin DIP plug connector into the keyboard connector socket on the video board. Note correct pin orientation as shown in Figure 4.

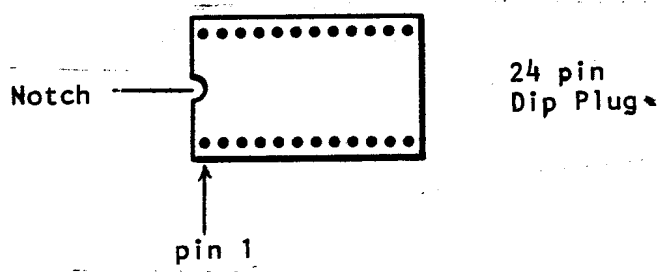


FIGURE 4

7. Connect video connector (MOLEX 6 PIN PLUG) to video output connector on video board. See figure 5.

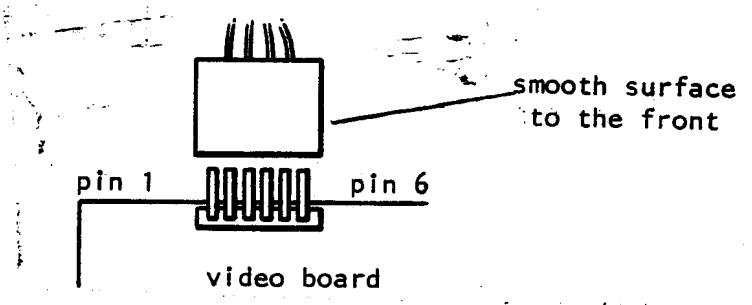


FIGURE 5

8. Check all connections; verify all boards are plugged into the motherboard. Connect the 25-conductor flat cable between the Mindless Terminal and the interface connector on the mainframe as shown in Figure 1. This completes the hardware connection of the Mindless Terminal.

2.3 CABLES

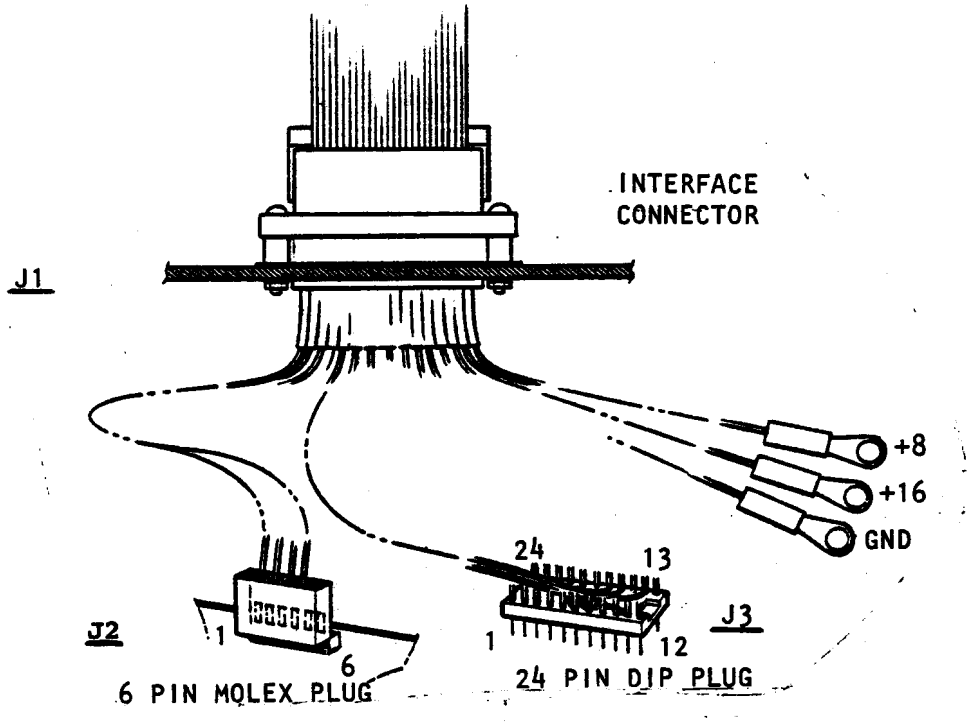
The following information is provided to help users connect the Mindless Terminal in non-standard situations. The "Interface Board" refers to the small PC board at the rear and inside the Mindless Terminal.

INTERCONNECT CABLE - CRT MONITOR / INTERFACE BOARD

MONITOR 10 PIN EDGE	INTERFACE BOARD 16 PIN DIP	SIGNAL
1	15, 16	HORZ GND
5	12, 13, 14	GND
6	6	H SYNC
7	1, 2, 3, 4	+12 VDC
8	7	VIDEO
9	5	V SYNC
10	9, 10, 11	VIDEO GND

INTERCONNECT CABLE - KEYBOARD / INTERFACE BOARD

INTERFACE BOARD 16 PIN DIP	KEYBOARD DUAL TEN PIN EDGE	SIGNAL
1	C	GND
2	C	GND
3	5	DATA 8
4	6	DATA 7
5	1	DATA 4
6	4	DATA 1
7	N/C	$\overline{\text{PRESET}}$
8	2	DATA 3
9	10	-V REG
10	E	STROBE
11	D	GND
12	7	DATA 6
13	3	DATA 2
14	8	DATA 5
15	9	VCC
16	9	VCC



INTERNAL PORTION OF VMTC

FROM	TO	WIRE GUAGE		SIGNAL
J2-2	J1-14	22	VIDEO	GROUND
-3	-15			TTL VIDEO
-4	-16			TTL HSYNC
-5	-17			TTL VSYNC
J3-7	J1-20	22	KYBD	DATA 1
-8	-21			DATA 3
-9	-22			-V REG
-11	-24			PRESET
-12	-25			STROBE
-13	-12			GND
-14	-11			DATA 4
-15	-10			DATA 6
-16	-9			DATA 7
-17	-8			DATA 2
-19	-6			DATA 8
-20	-5			DATA 5
+8V	J1-1	18	POWER	+8V VDC UNREG
+16	-18			+16 VDC UNREG
+16	-19			+16 VDC UNREG
GND	-2			GROUND
GND	-3			GROUND

2.4 KEYBOARD CODE CONVERSION

Due to limitations in the keyboard encoder chip, it was not possible to provide several codes, in particular, those for the following characters:

[(5B)
] (5D)
\ (5C)
~ (7E)

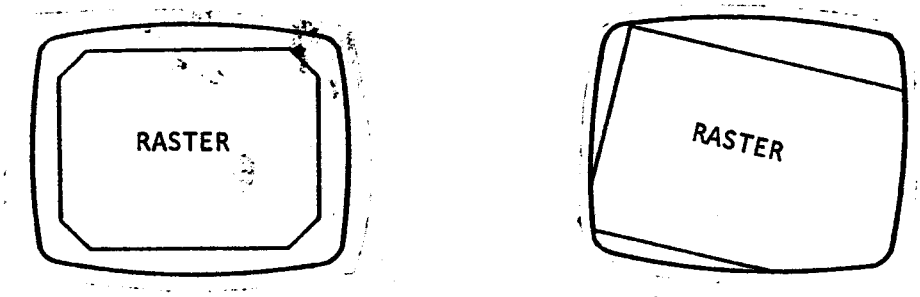
The conversion can be done in software, as the [] key generates unique codes for the four modes: unshifted, shifted, control, control shift. This conversion is done in the Version 3 Monitor PROM (purchased separately from Vector Graphic), which is the companion PROM for this keyboard. Furthermore this PROM version accepts the codes generated by the cursor control keys. Order Monitor 3 EV for the 64 X 16 Flashwriter I video board, and Monitor 3 EV-II for the 80 X 24 Flashwriter II video board.

2.5 ADJUSTING PROCEDURE FOR CRT MONITOR

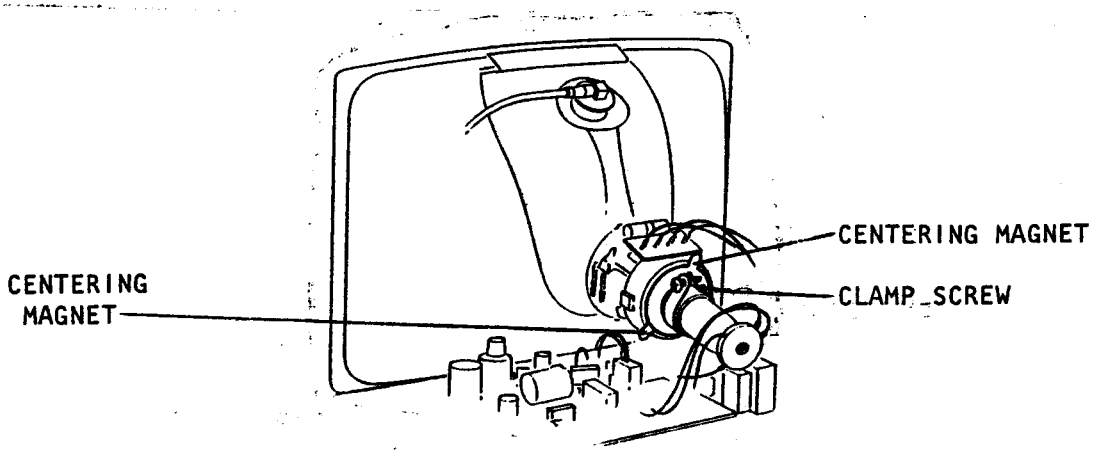
Normally, no adjustment of the CRT screen should be required as it is adjusted at the factory. However, if adjustment is required for any reason, the following explanation of the functions of the various adjustments is provided. All the adjustments except the last two must be made inside the Mindless Terminal, requiring you to unscrew and remove the shell.

It is assumed that the terminal is connected properly to the computer. A display which can be used to check adjustment is obtained by depressing RESET on the mainframe front panel to call up the Monitor Executive, then, for the Flashwriter I board, by typing Z D400 D7FF 06, or for the Flashwriter II video board by typing Z D000 D7FF 38.

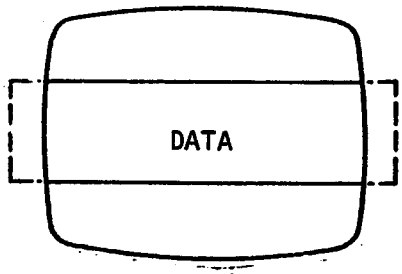
1. If the deflection yoke is not firmly against the bell of the tube, shadows will be caused at the corners of the display as shown below. If the yoke is slightly twisted, the display will also be twisted.



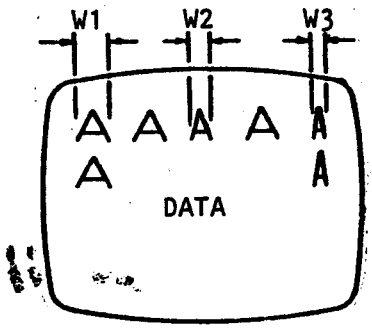
Adjustment for this is made by first loosening the clamp screw holding the yoke and positioning it properly. CAUTION: DO NOT TOUCH ANY OF THE ELECTRICAL TERMINALS ON THE TUBE OR YOKE, AS HIGH VOLTAGES ARE PRESENT. Tighten the clamp gently when finished.



2. If the width of the display is improper, adjust the core of the width coil (L103) on the P.C. board.

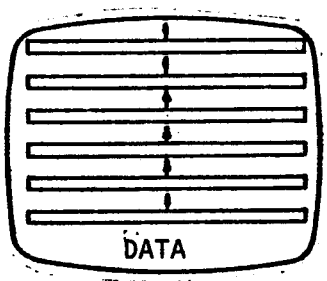


3. When data linearity in the horizontal direction is not good:



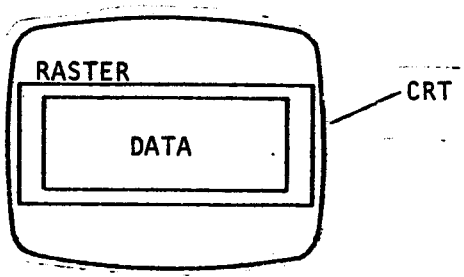
Turn the core of the horizontal linearity coil (L102) so that $W_1=W_2=W_3$.

4. When data runs in the vertical direction:



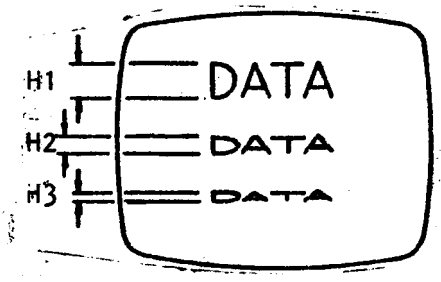
Turn the V. HOLD pot with a screwdriver and stop data display.

5. When the vertical size (height) of data is not proper:



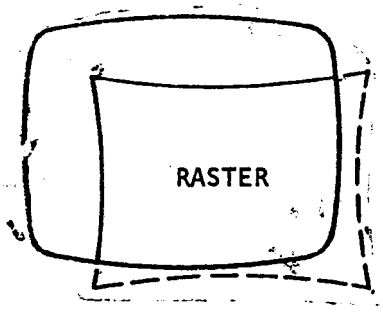
Turn the HEIGHT pot (R110) with a screwdriver to adjust the height as required.

6. When vertical linearity of data is not good:



Turn the V. LIN pot with a screwdriver so that $H_1=H_2=H_3$.

7. Raster deviation:



Turn the two centering magnets so that the raster is centered in the vertical direction.

8. When data is not focused satisfactorily, turn the FOCUS pot (R122) with a screwdriver so that focusing of the entire picture is optimum.

9. The correct adjustment of the brightness potentiometer R117 is when the background raster is just barely extinguished (black). If you can see faint lines zig-zagging across the screen in the background, turn the brightness down.

10. The contrast pot on the rear of the chassis should then be set to the minimum consistent with good legibility of the display. This will depend on the ambient light level and personal preference.

11. The horizontal positioning is controlled by both the video CENT (A103) control and also the position control on the upper left hand corner of the Flashwriter board. The latter is the preferred adjustment.

APPENDIX A
ASCII CODE CHART

1968 ASCII: American Standard Code for Information Interchange. Standard No. X3.4-1968 of the American National Standards Institute.

Bits	b_7→	0	0	0	0	1	1	1	1
	b_6→	0	0	1	1	0	0	1	1
	b_5→	0	1	0	1	0	1	0	1
b_4 b_3 b_2 b_1	COLUMN→ / ↓ROW↓	0	1	2	3	4	5	6	7
0 0 0 0	0	NUL	DLE	SP	0	@	P	`	p
0 0 0 1	1	SOH	DC1	!	1	A	Q	a	q
0 0 1 0	2	STX	DC2	"	2	B	R	b	r
0 0 1 1	3	ETX	DC3	#	3	C	S	c	s
0 1 0 0	4	EOT	DC4	$	4	D	T	d	t
0 1 0 1	5	ENQ	NAK	%	5	E	U	e	u
0 1 1 0	6	ACK	SYN	&	6	F	V	f	v
0 1 1 1	7	BEL	ETB	'	7	G	W	g	w
1 0 0 0	8	BS	CAN	(	8	H	X	h	x
1 0 0 1	9	HT	EM	)	9	I	Y	i	y
1 0 1 0	A	LF	SUB	*	:	J	Z	j	z
1 0 1 1	B	VT	ESC	+	;	K	[	k	{
1 1 0 0	C	FF	FS	,	<	L	\	l	|
1 1 0 1	D	CR	GS	-	=	M	]	m	}
1 1 1 0	E	SO	RS	.	>	N	^	n	~
1 1 1 1	F	SI	US	/	?	O	_	o	DEL

All characters in these two columns and SP (Space) are non-printing.

When UPPER CASE ONLY is used, shaded lower case characters (columns 6 & 7) from keyboard are converted to their upper case equivalents (columns 4 & 5) before being printed or transmitted.

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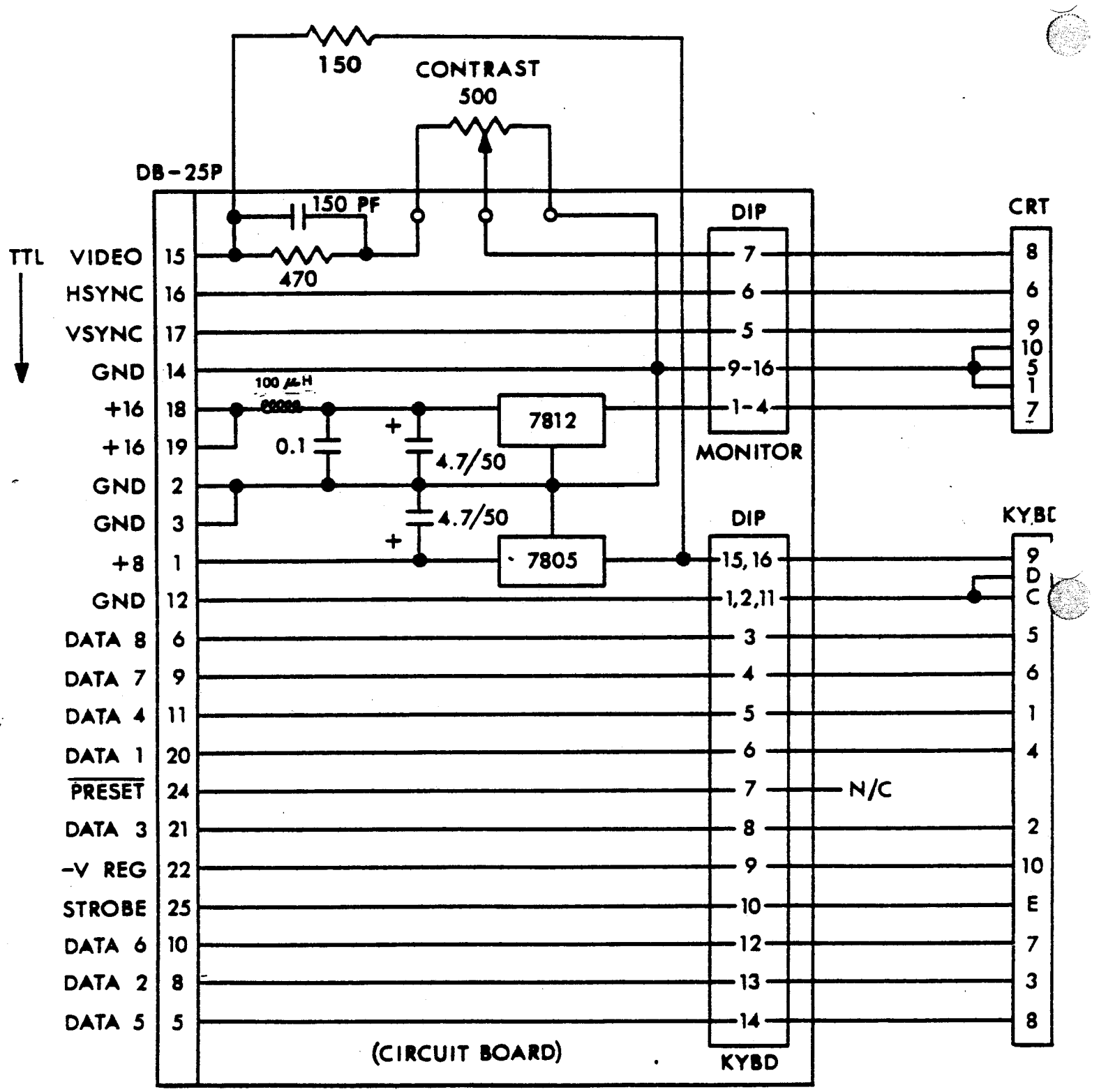


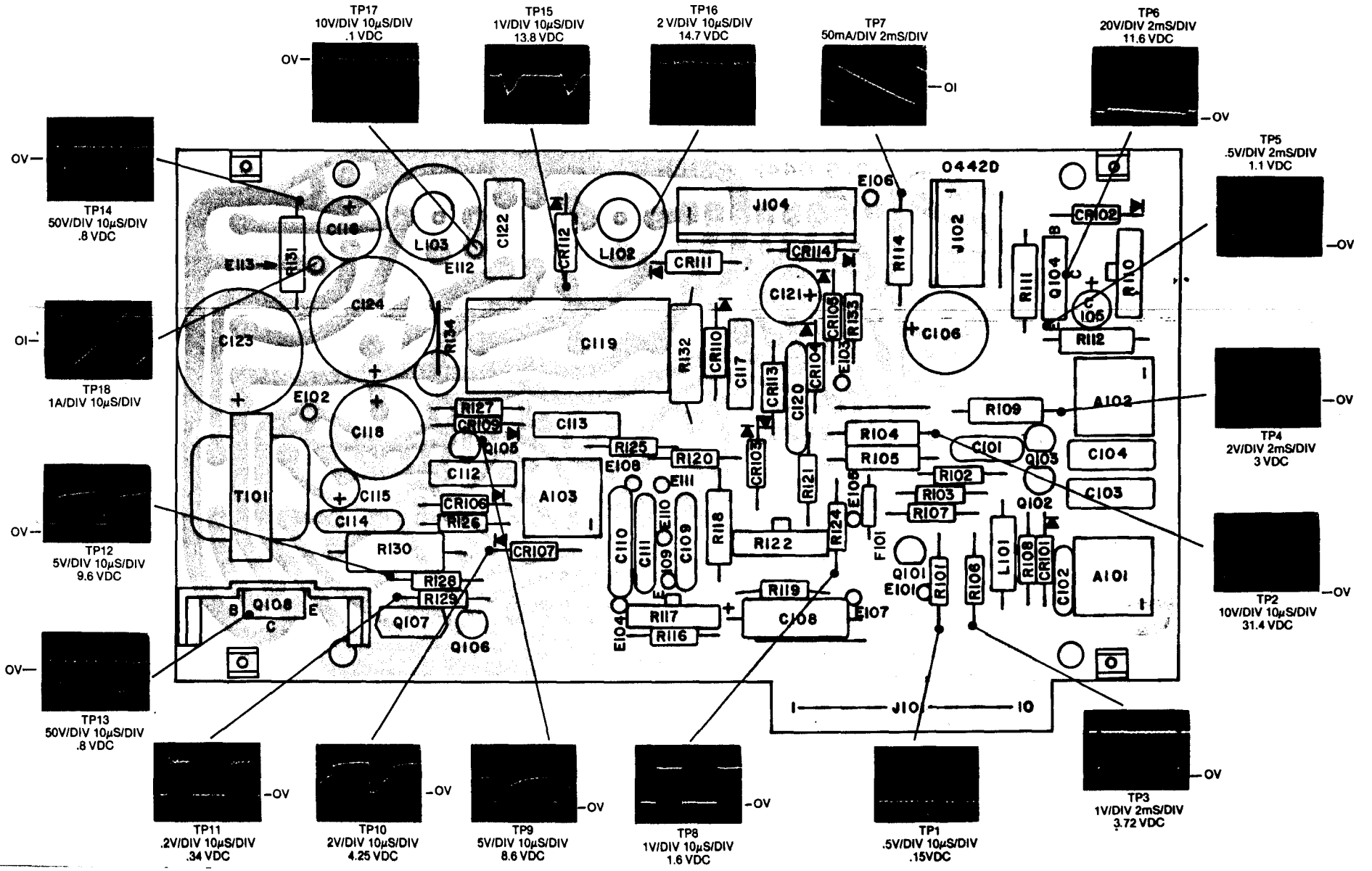
INTERFACE BOARD AT REAR OF MINDLESS TERMINAL - SCHEMATIC

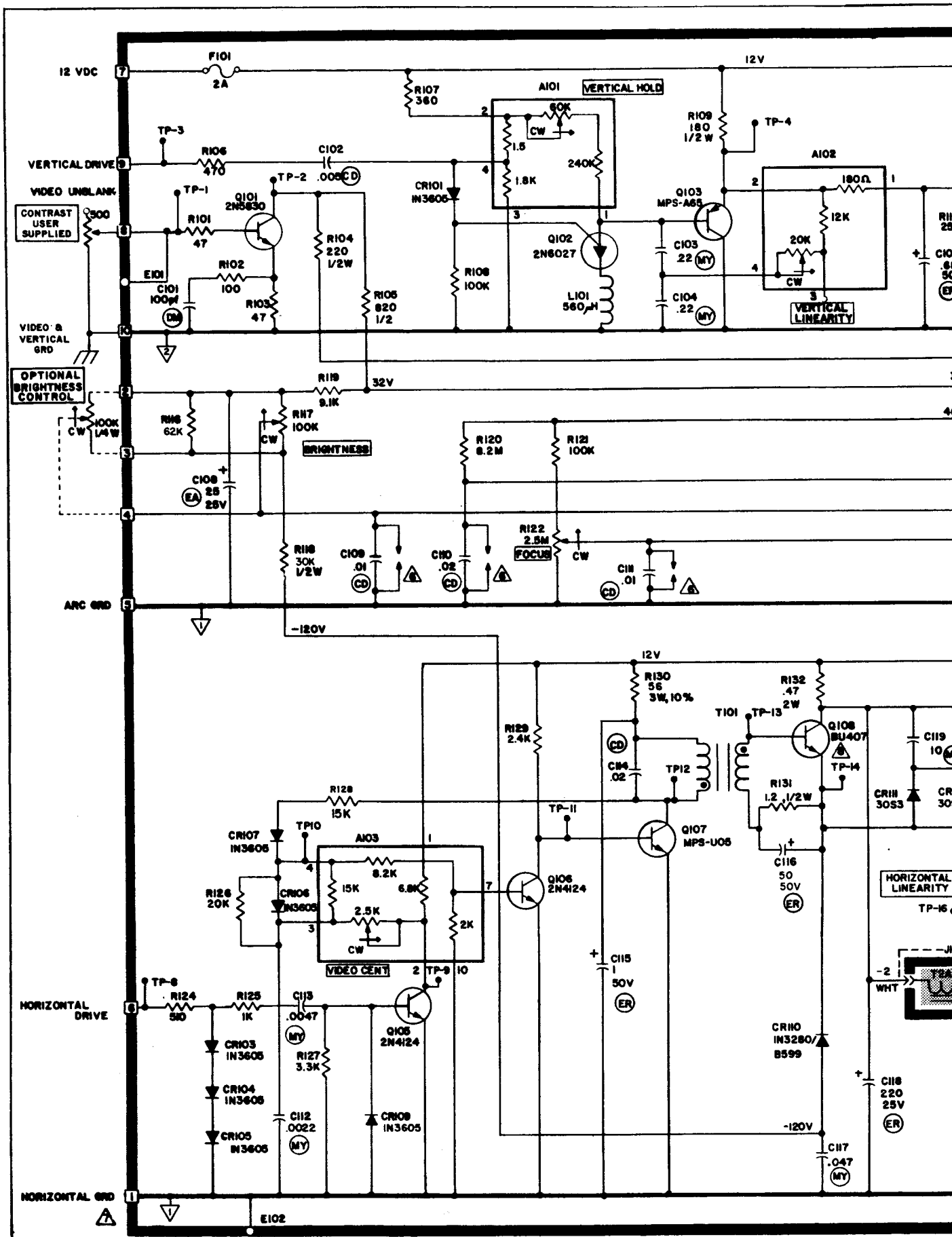
PARTS LIST TV 90/120, 12V

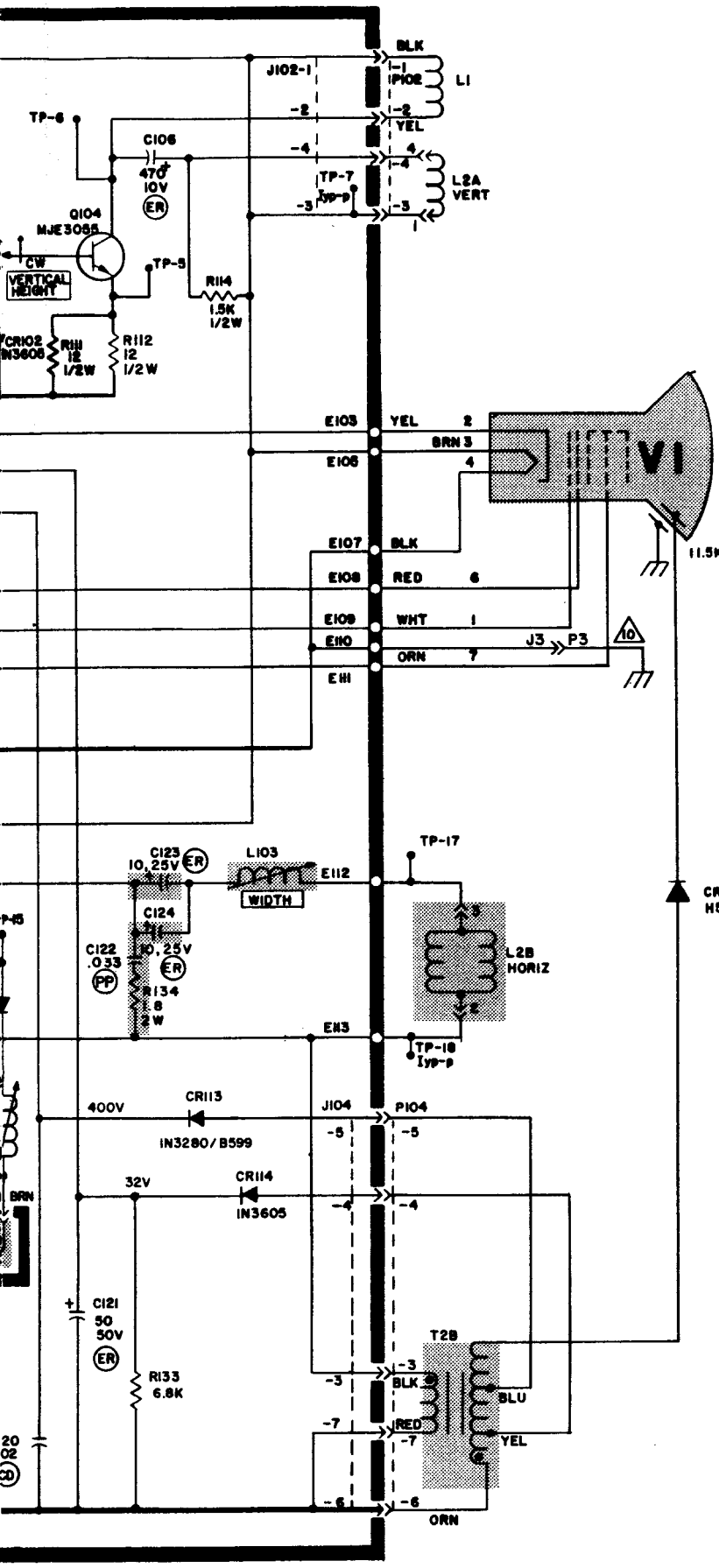
REF SYM	DESCRIPTION	BBRC PART NUMBER	USED ON 6-002 0698	0686	0697	0710	0733	0731	0735
A101	RES TRIM, 60K, VERT HOLD	1-011-8006	X	X	X	X	X	X	X
A102	RES TRIM, 20K, VERT LIN	1-011-8005	X	X	X	X	X	X	X
A103	RES TRIM, 2.5K, VIDEO CENTER	1-011-8001	X	X	X	X	X	X	X
	CAPACITOR, FIXED, uF UNLESS NOTED								
C101	100pF±5%, 500v, DM	1-012-0300	X	X	X	X	X	X	X
C102	.005±20%; 100v, CD	10-12-7508	X	X	X	X	X	X	X
C103	.22±10%; 100v, MY	1-012-2277	X	X	X	X	X	X	X
C104	.22±10%; 100v, MY	1-012-2277	X	X	X	X	X	X	X
C105	.68; 50v, E	1-012-2264	X	X	X	X	X	X	X
C106	470; 10v, E	1-012-2158	X	X	X	X	X	X	X
C107	NOT USED								
C108	25; 25v, E	1-012-1380	X	X	X	X	X	X	X
C109	.01±20%; 1000v, CD	1-012-2214	X	X	X	X	X	X	X
C110	.02±20%; 1000v, CD	1-012-2217	X	X	X	X	X	X	X
C111	.01±20%; 1000v, CD	1-012-2214	X	X	X	X	X	X	X
C112	.0022±10%; 630v, MY	1-012-2254	X	X	X	X	X	X	X
C113	.0047±10%; 630v, MY	1-012-2279	X	X	X	X	X	X	X
C114	.02±20%; 100v, CD	10-12-7209	X	X	X	X	X	X	X
C115	1; 50v, E	1-012-2189	X	X	X	X	X	X	X
C116	50; 50v, E	1-012-2157	X	X	X	X	X	X	X
C117	.047±10%; 250v, MY	1-012-2240	X	X	X	X	X	X	X
C118	220; 25v, E	1-012-2159	X	X	X	X	X	X	X
C119	10±10%; 100v, MY	1-012-2255	X	X	X	X	X	X	X
C120	.02±20%; 500v, CD	1-012-0780	X	X	X	X	X	X	X
C121	50; 50v, E	1-012-2157	X	X	X	X	X	X	X
C122	.033±10%; 250V, MY	1-012-2298	X	X	X	X	X	X	X
C123	10; 25v, E	1-012-2273	X	X	X	X	X	X	X
C124	10; 25v, E	1-012-2273	X	X	X	X	X	X	X
	DIODE								
CR1	H510	1-021-0424	X	X	X	X	X	X	X
CR101	1N3605	1-021-0410	X	X	X	X	X	X	X
CR102	1N3605	1-021-0410	X	X	X	X	X	X	X
CR103	1N3605	1-021-0410	X	X	X	X	X	X	X
CR104	1N3605	1-021-0410	X	X	X	X	X	X	X
CR105	1N3605	1-021-0410	X	X	X	X	X	X	X
CR106	1N3605	1-021-0410	X	X	X	X	X	X	X
CR107	1N3605	1-021-0410	X	X	X	X	X	X	X
CR108									
CR109	1N3605	1-021-0410	X	X	X	X	X	X	X
CR110	1N3280/B599	1-021-0403	X	X	X	X	X	X	X
CR111	30S3	1-021-0458	X	X	X	X	X	X	X
CR112	30S3	1-021-0458	X	X	X	X	X	X	X
CR113	1N3280/B599	1-021-0403	X	X	X	X	X	X	X
CR114	1N3605	1-021-0410	X	X	X	X	X	X	X
	FUSE								
F101	2A-125v, PICO	1-028-0247	X	X	X	X	X	X	X
	CONNECTORS								
J102	CONNECTOR, 4 PIN MALE	1-039-0146	X	X	X	X	X	X	X
J103	NOT USED								
J104	CONNECTOR, 7 PIN MALE	1-039-0145	X	X	X	X	X	X	X
P3	CONNECTOR, 1 PIN FEMALE	1-034-0323				X			X
J3	CONNECTOR, 1 PIN MALE	1-034-0300				X			X
	COIL								
L1	VERTICAL CHOKE	6-003-0572	X	X	X	X	X	X	X
L2	DEFLECTION, TV 120	1-023-0239			X	X	X		X
	OR DEFLECTION, TV 90	1-023-0240	X	X				X	
L101	560uH	1-016-0302	X	X	X	X	X	X	X
L102	LINEARITY	1-016-0328	X	X	X	X	X	X	X
L103	WIDTH	1-016-0323	X	X	X	X	X	X	X

REF SYM	DESCRIPTION	BBRC PART NUMBER
	TRANSISTOR	
Q101	2N5830	1-015-1172
Q102	2N6027	1-015-1157
Q103	MPS-A65	1-015-1186
Q104	MJE3055	1-015-1156
Q105	2N4124	1-015-1139
Q106	2N4124	1-015-1139
Q107	MPS-U05	1-015-1159
Q108	BU407	1-015-1210
	RESISTOR, FIXED, CARBON, ±5%; 1/4w UNLESS NOTED	
R101	47	70-16-0470
R102	100	70-16-0101
R103	47	70-16-0470
R104	220; 1/2w	1-011-2254
R105	820; 1/2w	1-011-2268
R106	470	70-16-0471
R107	360	70-16-0361
R108	100K	70-16-0104
R109	180	1-011-2252
R110	VAR; 250±20%; CO VERT HGT	70-89-0251
R111	12; 1/2w	1-011-2224
R112	12; 1/2w	1-011-2224
R113	NOT USED	
R114	1.5K; 1/2w	1-011-2274
R115	NOT USED	
R116	62K	70-16-0623
R117	VAR; 100K±20%; CO BRT ADJ	1-011-5435
R118	30K; 1/2w	1-011-2305
R119	9.1K	70-16-0912
R120	8.2M	70-16-0825
R121	100K	70-16-0104
R122	VAR: 2.5M±20%, CO FOC ADJ	1-011-5566
R123	NOT USED	
R124	510	70-16-0511
R125	1K	70-16-0102
R126	20K	70-16-0203
R127	3.3K	70-16-0332
R128	15K	70-16-0153
R129	2.4K	70-16-0242
R130	56±10%; 3W, WW	70-16-2521
R131	1.2; 1/2w	1-011-2520
R132	.47±10%; 2w, WW	1-011-1394
R133	6.8K	70-16-0682
R134	1.8±5%; 2W	1-011-2417
R135	NOT USED	
	TRANSFORMER	
T1	NOT USED	
T2	HIGH VOLTAGE, TV90	6-003-0605
	OR HIGH VOLTAGE, TV90/TRW	6-003-0571
	OR HIGH VOLTAGE, TV120	6-003-0599
	OR HIGH VOLTAGE, TVX120	6-003-0586
T101	HORIZ DRIVER	1-017-5402
	MISCELLANEOUS	
	CRT SOCKET	1-022-0427

USED ON 6-002-
0698 0696 0697 0710 0733 0731 0735




12 VDC
F101
2A
R107
360
A101
VERTICAL HOLD
60K
CW
1.5
1.8K
240K
12V
R109
180
1/2 W
TP-4
A102
180Ω
12K
20K
CW
VERTICAL LINEARITY
TP-3
VERTICAL DRIVE
R106
470
C102
.005
CD
TP-2
CR101
IN3606
VIDEO UNBLANK
TP-1
Q101
2N5830
CONTRAST USER SUPPLIED
500
R101
47
R104
220
1/2W
R105
820
1/2
R108
100K
Q102
2N6027
L101
560μH
Q103
MPS-A65
C103
.22
MY
C104
.22
MY
E101
C101
100pf
DM
R102
100
R103
47
VIDEO & VERTICAL GRD
OPTIONAL BRIGHTNESS CONTROL
100K
1/4W
R119
9.1K
32V
R116
62K
RH7
100K
CW
BRIGHTNESS
R120
8.2M
R121
100K
C106
25
25V
EA
R118
30K
1/2W
C109
.01
CD
C110
.02
CD
R122
2.5M
FOCUS
CW
C111
.01
CD
ARC GRD
-120V
12V
R130
56
3W, 10%
R132
.47
2W
T101
TP-13
Q108
BU407
TP-14
C119
10
R129
2.4K
C114
.02
CD
TP12
R131
1.2, 1/2W
CR111
30S3
R128
15K
TP-11
CR107
IN3606
TP10
A103
8.2K
15K
6.8K
2.5K
2K
CW
VIDEO CENT
TP-9
Q107
MPS-U05
C116
50
50V
ER
HORIZONTAL LINEARITY
TP-16
R126
20K
CR106
IN3606
Q106
2N4124
C115
1
50V
ER
TP-8
HORIZONTAL DRIVE
R124
510
R125
1K
C113
.0047
MY
Q105
2N4124
CR103
IN3606
CR104
IN3606
CR105
IN3606
R127
3.3K
C112
.0022
MY
CR109
IN3605
CR110
IN3280/
B599
C118
220
25V
ER
-120V
C117
.047
MY
WHT
HORIZONTAL GRD
E102



GENERAL NOTES: UNLESS OTHERWISE SPECIFIED

1. ALL RESISTORS 1/4W, 5%, VALUES IN OHMS.
2. ALL CAPACITOR VALUES IN MICROFARADS. FOR CAPACITOR TYPES, SEE NOTE #9.
3. □ DENOTES J101 PC CARD EDGE CONNECTOR.
4. →)→ DENOTES CONNECTION TO OFF BOARD COMPONENTS.
5. REFERENCE DESIGNATIONS NOT USED: R113, R115
   LAST REFERENCE DESIGNATION USED: R134, C124
6. PROTECTIVE ARC GAPS ARE AN INTEGRAL PART OF PRINTED WIRE BOARD.
7. THE PWB CIRCUIT GROUNDS ARE BROUGHT OUT SEPARATELY TO PINS 1, 5 AND 10 OF J101. PWB CIRCUIT GROUNDS FOR PINS 1 AND 5 OF J101 ARE CONNECTED TOGETHER BY A JUMPER WIRE ON THE BOARD AND ARE CONNECTED TO CHASSIS GROUND VIA A WIRE FROM E110.

   THE DATA DISPLAY UNIT IS CONNECTED TO THE SYSTEM GROUND THROUGH PINS 1 AND 10 OF J101. FOR NON-STANDARD GROUNDING TECHNIQUES REFER TO SECTION 2 OF THE SERVICE MANUAL.
8. DENOTES HEATSINK
9. (DM) = DIPPED MICA
   (CD) = CERAMIC DISC.
   (MY) = MYLAR
   (EA) = ELECTROLYTIC AXIAL
   (ER) = ELECTROLYTIC RADIAL
   (PP) = POLYPROPYLENE
10. P3 AND J3 ARE USED ONLY ON THE TVX90 AND TVX120 MODELS.

PRODUCT SAFETY MUST BE CONSIDERED WHEN ANY COMPONENT IS REPLACED IN THIS MONITOR. THE CRITICAL COMPONENTS THAT AFFECT X-RADIATION ARE DENOTED IN THE SHADED AREAS ON THE SCHEMATIC. COMPONENTS IN THE SHADED AREA ARE TO BE REPLACED ONLY WITH EDO DIV. APPROVED COMPONENTS.

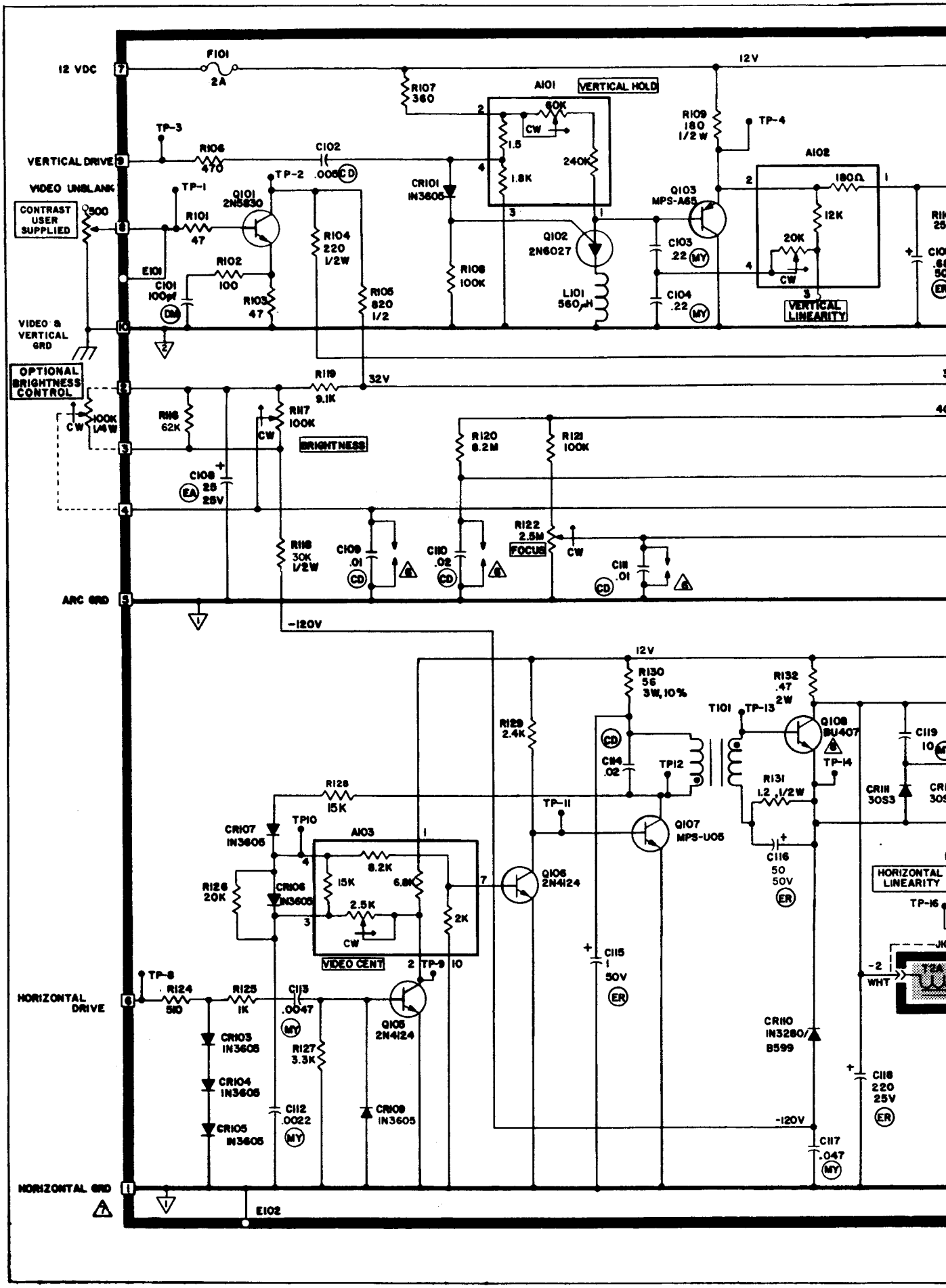
THE USE OF SUBSTITUTE COMPONENTS WHICH DO NOT HAVE THE SAME CHARACTERISTICS AS THE EDO DIV. ORIGINAL COMPONENTS MAY CREATE EXCESSIVE X-RADIATION.

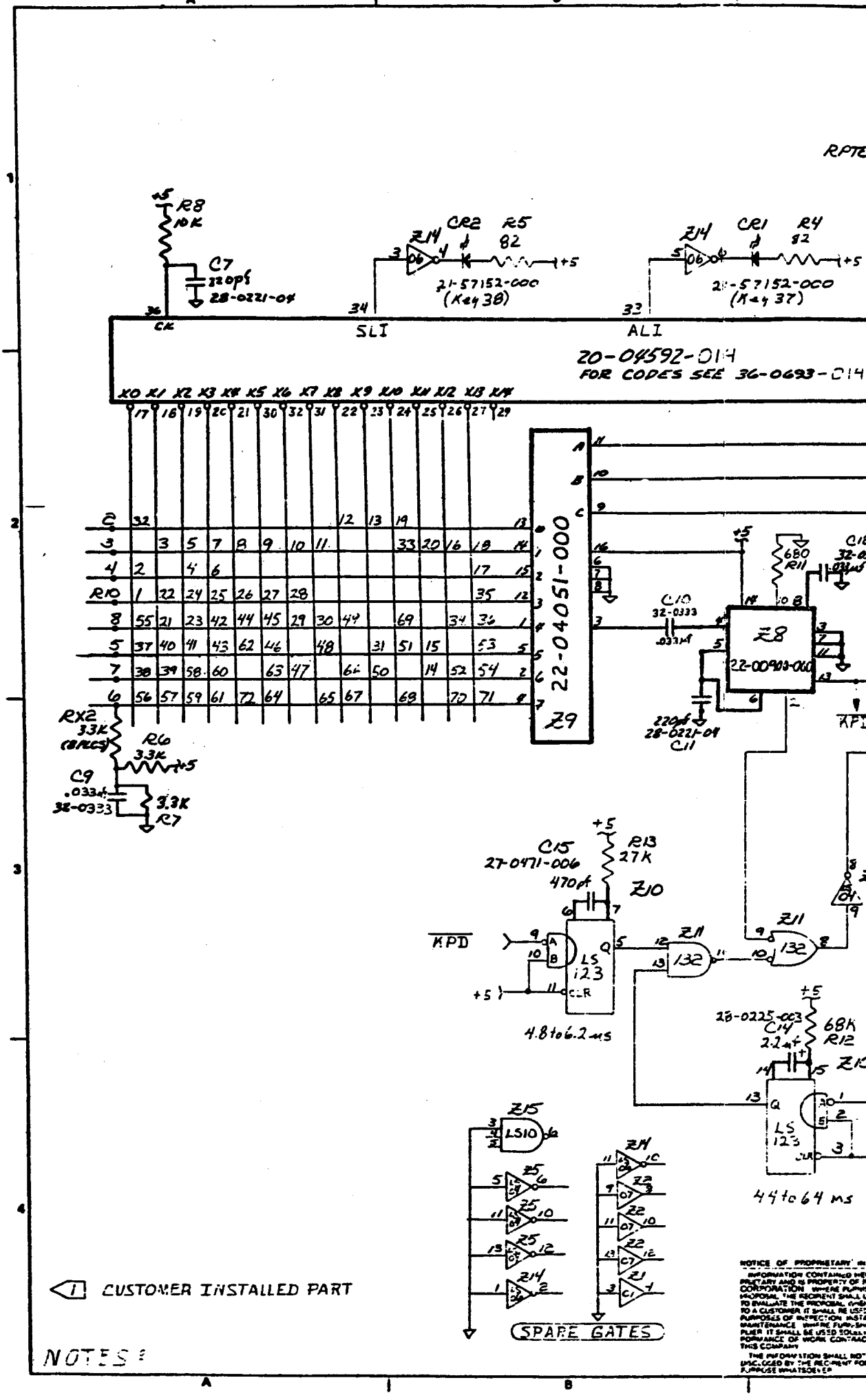
	SIGNATURE	DATE
DRAFTSMAN		
CHECKER		
DESIGNER		
ENGINEER		

TITLE: SCHEMATIC TV-90/120 DC 12 VOLT

SIZE D | DRAWING NO. 1-024-0584 | REV. B

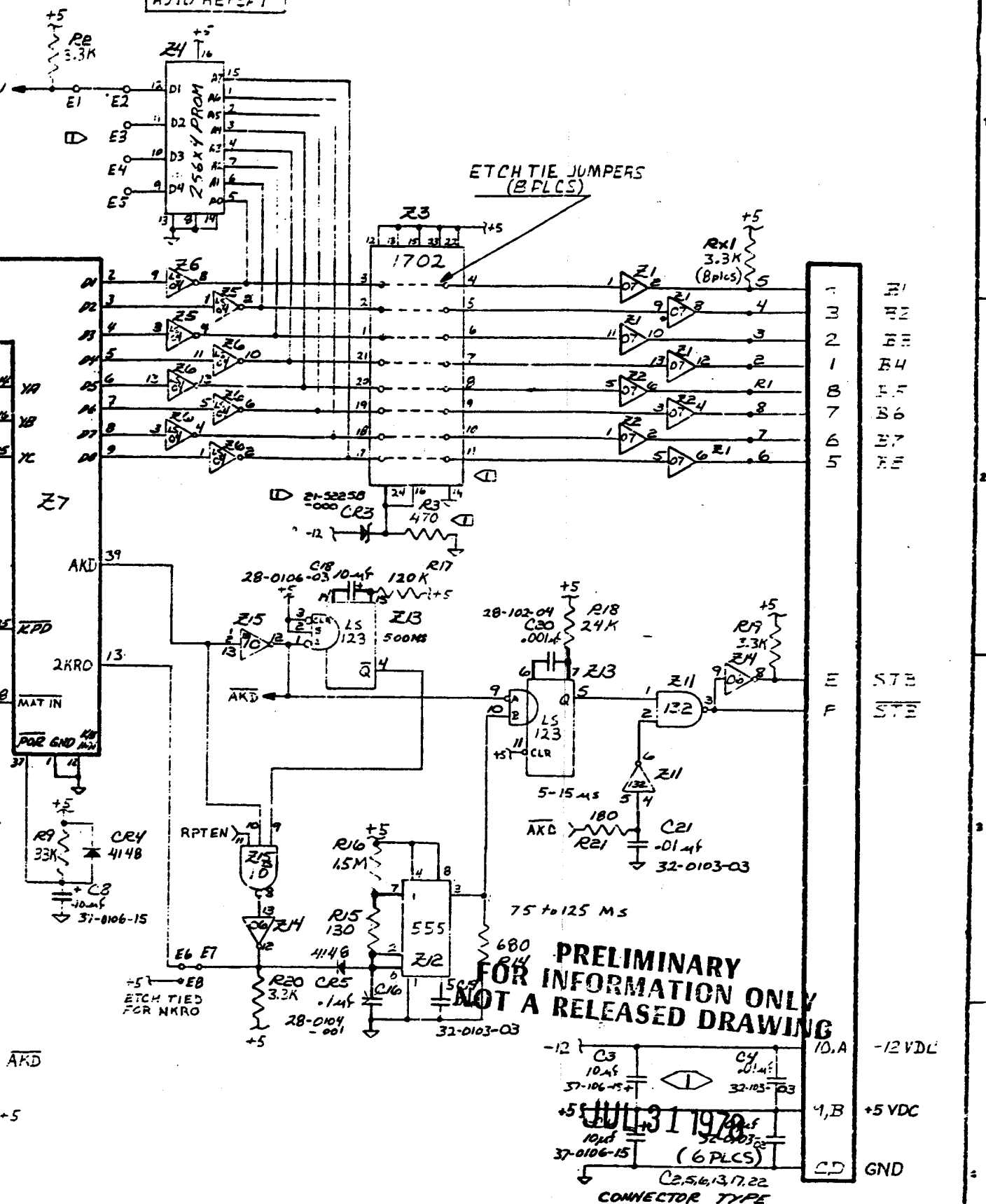
USED ON | SCALE NONE | SHEET 1 OF 2


12 VDC
F101
2A
R107
360
A101
VERTICAL HOLD
60K
CW
1.5
1.8K
240K
12V
R109
180
1/2 W
TP-4
TP-3
VERTICAL DRIVE
R106
470
C102
.006
CD
TP-2
CR101
IN3605
A102
180Ω
12K
20K
CW
VERTICAL LINEARITY
VIDEO UNBLANK
TP-1
CONTRAST
USER
SUPPLIED
500
Q101
2N5830
R101
47
R104
220
1/2W
R102
100
R103
47
E101
C101
100pf
DM
R105
820
1/2
R108
100K
Q102
2N6027
L101
560μH
Q103
MPS-A65
C103
.22
MY
C104
.22
MY
VIDEO &
VERTICAL
GRD
OPTIONAL
BRIGHTNESS
CONTROL
R119
9.1K
32V
100K
1/4W
CW
R116
62K
R117
100K
CW
BRIGHTNESS
R120
8.2M
R121
100K
C106
25
25V
EA
R118
30K
1/2W
C109
.01
CD
C110
.02
CD
R122
2.5M
FOCUS
CW
C111
.01
CD
ARC GRD
-120V
12V
R130
56
3W, 10%
R132
.47
2W
T101
TP-13
Q108
BU407
TP-14
C119
10
R129
2.4K
C114
.02
CD
TP12
R131
1.2
1/2W
CR111
30S3
R128
15K
TP-11
CR107
IN3605
TP10
A103
8.2K
15K
6.8K
2.5K
2K
CW
VIDEO CENT
CR106
IN3605
R126
20K
Q106
2N4124
Q107
MPS-U05
C116
50
50V
ER
HORIZONTAL
LINEARITY
TP-16
C115
1
50V
ER
TP-9
2
10
TP-8
HORIZONTAL
DRIVE
R124
510
R125
1K
C113
.0047
MY
Q108
2N4124
CR103
IN3605
CR104
IN3605
CR105
IN3605
R127
3.3K
C112
.0022
MY
CR109
IN3605
CR110
IN3280/
B599
C118
220
25V
ER
-120V
C117
.047
MY
HORIZONTAL GRD
E102
WHT


R8
10K
C7
220pf
28-0221-04
CR2
R5
82
Z14
21-57152-000
(Key 38)
CR1
R4
82
21-57152-000
(Key 37)
SLI
ALI
20-04592-014
FOR CODES SEE 36-0693-014
X0 X1 X2 X3 X4 X5 X6 X7 X8 X9 X10 X11 X12 X13 X14
22-04051-000
Z9
RX2
3.3K
R6
3.3K
C9
.033μf
32-0333
3.3K
R7
C10
32-0333
.033μf
Z8
22-00903-000
220pf
28-0221-04
C11
680
R11
KPD
C15
27-0471-006
470pf
R13
27K
Z10
LS
123
4.8to6.2ms
Z11
132
28-0225-003
C14
2.2μf
68K
R12
LS
123
44to64 ms
Z15
LS10
Z14
Z5
Z4
Z2
Z1
SPARE GATES
1 CUSTOMER INSTALLED PART
NOTES:

EFF.	REV.	ECO	BY	DESCRIPTION	APP.	DATE
	~	~		PROTO RELEASE		

PROGRAMABLE AUTO REFEAT



ITEM	PART NO.	DESCRIPTION	QTY.

MANUFACTURE PARTS AND/OR ASSY'S PER K.T.C. DOCUMENT: FTP 36-C442

UNLESS OTHERWISE NOTED ALL DIMENSIONS ARE IN INCHES
XXX DIMENSION NOT TO SCALE
TOL. EXCEPT AS NOTED
HOLE DIA. FRACT. ± 1/64" XX ± .01" XXX ± .005" ANG. ± 1°

USED ON VECTOR GRAPHICS

	RELEASED	
APP.		11-10-7
CH.		7-6-83
DR.	C M	7-5-83

SCALE ~ TITLE SCHEMATIC

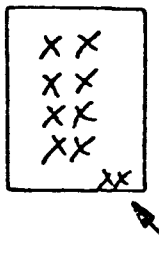
key tronic corporation
SPOKANE, WASH., U.S.A.

DWG. NO. 35-1892

SHEET OF C

1B 1		21 31 21 31 2	00 32 40 32 3	23 33 23 33 4	24 34 24 34 5	25 35 25 35 6	5E 36 5E 36 7	26 37 26 37 8
7F 19	09 20	11 11 51 71 21	17 17 57 77 22	05 05 45 65 23	12 12 52 72 24	14 14 54 74 25	19 19 59 79 26	1 1 5 7
ALL CAPS 37	LOCK 38	01 01 41 61 39	13 13 53 73 40	04 04 44 64 41	06 06 46 66 42	07 07 47 67 43	08 08 48 68 44	
CTRL 55	SHIFT 56	1A 1A 5A 7A 57	18 18 58 78 58	03 03 43 63 59	16 16 56 76 60	02 02 42 62 61	0E 0E 4E 6E 6	

20



MANUFACTURE PARTS AND/OR ASSY'S PER K.T.C. DOCUMENT:

AL

.XXX

USED ON

VECT

GRAF

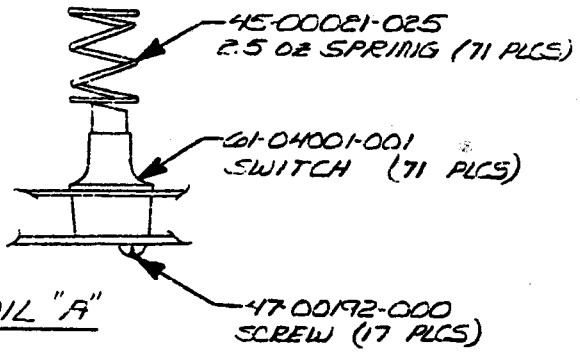
189

EFF.	REV.	ECO	BY	DESCRIPTION	APP	DATE

2A 38 2A 38 9	28 39 28 39 10	29 30 29 30 11	5F 2D 5F 2D 12	2B 3D 2B 3D 13	08 14	17 15	37 16	38 17	39 18
09 09 49 69 29	0F 0F 4F 6F 29	10 10 50 70 30	1D 1D 7D 7B 31	A1 B1 E1 F1 32		7E 60 7E 60 33	34 34	35 35	36 36
0A 0A 4A 6A 45	0B 0B 4B 6B 46	0C 0C 4C 6C 47	3A 3B 3A 3B 48	22 27 22 27 49	0D 50	82 92 82 92 51	31 52	32 53	33 54
0D 0D 4D 6D 63	3C 2C 3C 2C 64	3E 2E 3E 2E 65	3F 2F 3F 2F 66	SHIFT 67		1A 68	0A 69	30 70	2E 71
72									

LOGIC IS POSITIVE

LESS OTHERWISE NOTED DIMENSIONS ARE IN INCHES	TOL. EXCEPT AS NOTED	ITEM	PART NO.	DESCRIPTION	QTY.
DIMENSION NOT TO SCALE					
R IICS 2	HOLE DIA.	SCALE ~	TITLE HEX CODE CHART		
RELEASED	XX ± .01"	key tronic corporation	DWG. NO. 36-00942		
APP.	XXX ± .005"	SPOKANE, WASH., U.S.A.			
CH.	ANG. ± 1°		SHEET OF		B
DR. CM 7-17-86					



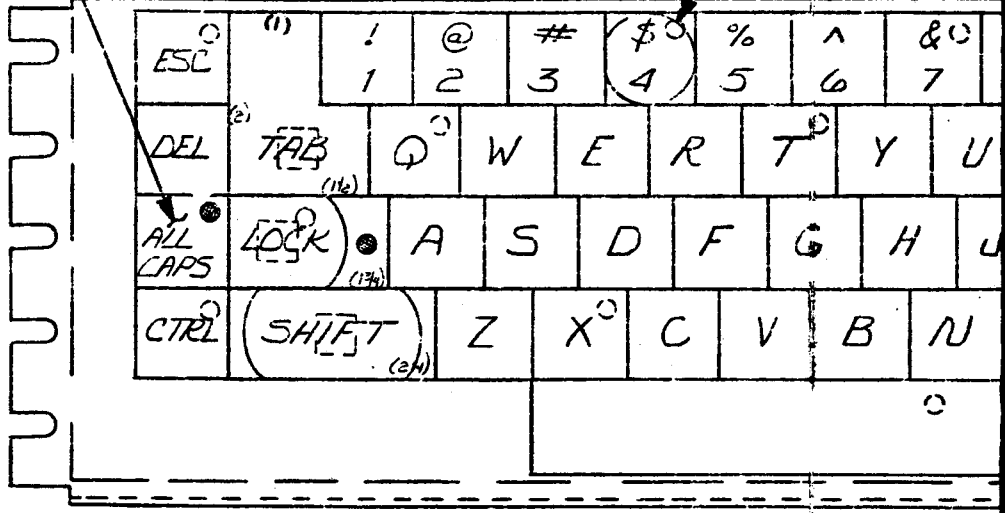
DETAIL "A"

INSTALL SWITCHES IN STEPPED POSITION

SEE DETAIL "A"

61-04005-001
SWITCH (1 PLC)

45-00024-025
2.5 oz SPRING
(1 PLC)

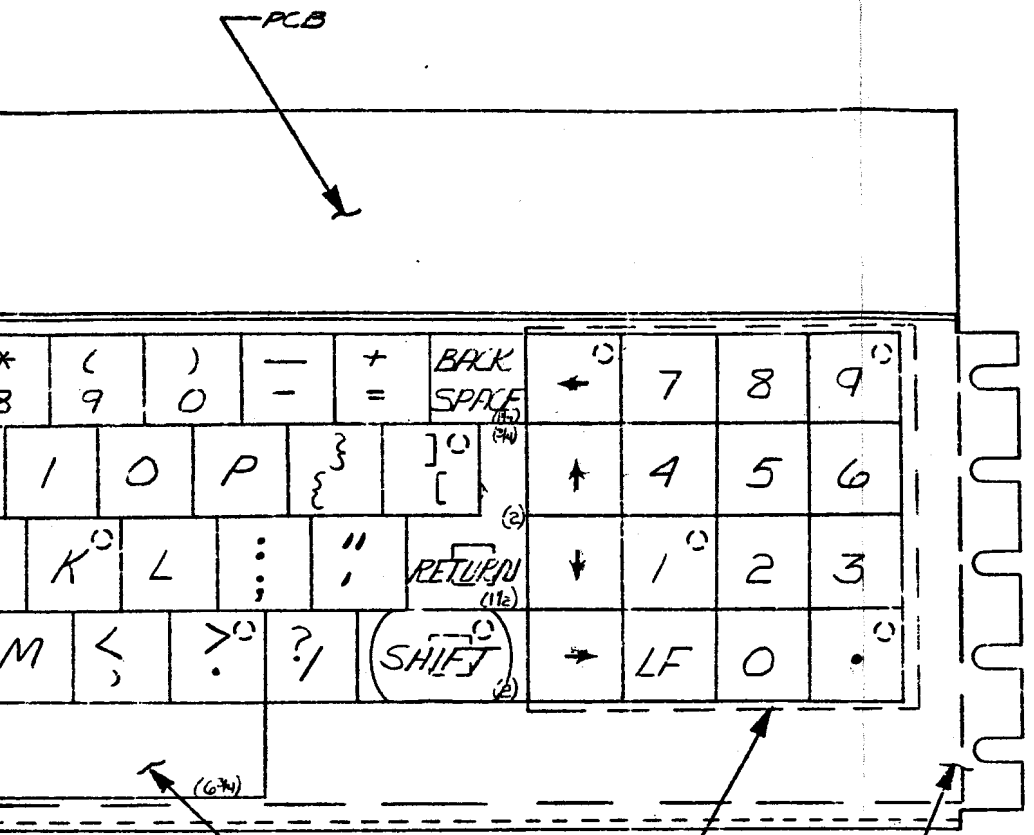


-00

3. KYBD IS LOW PROFILE STEPPED UNLESS OTHERWISE MARKED.
2. PLUNGERS ARE CENTER LOCATED UNLESS OTHERWISE SHOWN.
1. APPLY "DATE SERIAL NO." ADHESIVE TAG TO COMPONENT SIDE OF PCB.

NOTES:

EFF.	REV.	ECO	BY	DESCRIPTION	APP.	DATE
~	~	~	KL	PROTO RELEASE 7/18 H#	TKK	7/19/78



ASSY

PRELIMINARY
FOR INFORMATION ONLY
NOT A RELEASED DRAWING

JUL 31 1978

ITEM	PART NO.	DESCRIPTION	QTY.

UNLESS OTHERWISE NOTED ALL DIMENSIONS ARE IN INCHES
XXX DIMENSION NOT TO SCALE
TOL. EXCEPT AS NOTED
HOLE DIA.
FRACT. ± 1/64"
XX ± .01"
XXX ± .005"
ANG. ± 1°

MANUFACTURE PARTS AND/OR ASSY'S PER K.T.C. DOCUMENT: M011

USED ON: VECTOR SCANNER

RELEASED		
APP. TKK	7/19	
CH. JRH	7-19-78	
DR. KL	7-18-78	

SCALE

TITLE: MECH. & KEYTOP ASSY

key tronic corporation
SPOKANE, WASH., U.S.A.

DWG. NO. 65-018942

SHEET OF

C