OPERATION AND SERVICE MANUAL

ELECTROHOME V17 DATA DISPLAY MONITOR

Issue: September 1978

PERFORMANCE DATA AND SPECIFICATIONS

Monitor Description

The V_{17} Series Data Display Monitors provide alpha-numeric displays in 12" and 15" formats for application with non-composite TTL signal drive.

Controls

With the exception of the Width Coil, all controls are located on the single printed circuit board and are identified as:

- Vertical hold
- Vertical size
- Vertical linearity
- Vertical linearity amplitude
- Focus
- Master brightness
- Horizontal centering
- High voltage adjust

Performance Specifications

Input Signal Levels

Video:	4Vpp positive level referenced to 0	Tolerance:
* Vertical sync:	4Vpp negative level referenced to 0	0 state 0V + .4V -0.0V
Horizontal sync:	4Vpp positive level referenced to 0	1 state 4V ±1.5V

* NOTE: The V_{17} chassis will operate with positive level vertical sync without modification.

Input Impedance

Video: 220 ohms shunted by 40pf max.

Vertical sync: 4Kohm min. shunted by 40pf max.

Horizontal sync: 4Kohm min. shunted by 40 pf max.

Video Amplifier

Band width: 22 mhz at -3dB

Resolution

Center 1000 lines

Corners 800 lines

Deflection

Horizontal retrace time	8.5 µsec. max.
Vertical retrace time	800 µsec. max.
EHT	17KV

Geometry Distortion:

The outline of a full screen of characters shall approach an ideal rectangle within 1.5% of the height of the rectangle.

Power Requirements:

Input power:	60 VA max.
Input voltage:	100 to 130 V.A.C. 50/60 Hz switchable to 200 to 260 V.A.C. 50/60 Hz

The input circuit comprises a split-primary transformer.

Environmental:

Operating ambient temperature:	+5°C to +55°C
Humidity:	5% to 80% non-condensing
Altitude:	to 10,000 feet
Storage:	-40°C to +60°C

Operating and Service Information

MEASUREMENT, X-RAY, HIGH VOLTAGE AND CRT WARNINGS

1. X-RADIATION

All cathode ray pix tubes emit some x-rays. This chassis has been designed for minimal x-radiation. However, to avoid possible exposure to soft x-radiation, ensure that EHT value is correctly set in accordance with procedures.

2. HIGH VOLTAGE

This data monitor chassis contains HIGH VOLTAGES derived from power supplies capable of delivering LETHAL quantities of energy. To avoid DANGER TO LIFE, do not attempt to service the chassis until all precautions necessary for working on HIGH VOLTAGE equipment have been observed. In order to prevent damage to solid state devices, do not arc pix tube anode lead to chassis or earth ground.

CAUTION: This chassis employs a high EHT (17KV) pix tube.

3. CRT HANDLING

The picture tube encloses a high vacuum and due to the large surface area is subject to extreme force. Care must be taken not to bump or scratch the picture tube as this may cause the tube to implode resulting in personal injury and property damage. Shatter-proof goggles must always be worn by individuals while handling the CRT. Do not handle the CRT by the neck.

PRODUCT SAFETY SERVICING GUIDELINES

CAUTION

No modification of any circuit should be attempted. Service work should be performed only after you are thoroughly familiar with the following safety checks and servicing guidelines. To do otherwise increases the risk of potential hazards and injury.

SAFETY CHECKS

Subject: Fire and Shock Hazard

1. Do not install, remove, or handle the picture tube in any manner unless shatterproof goggles are worn. People not so equipped should be kept away while picture tubes are handled. Keep the picture tube away from the body while handling.

2. When service is required, observe the original lead dress. Extra precaution should be given to assure correct lead dress in the high voltage circuitry area. Where a short circuit has occurred, replace these components that indicate evidence of overheating. Always use the manufacturer's replacement component.

3. Always check high voltage for proper value and at all times use an accurate high voltage meter. The calibration of this meter should be checked periodically.

4. After servicing of the monitor, perform an A.C. leakage test on the exposed metallic cabinet to be sure the set is safe to operate without danger of electrical shock. Do not use a line isolation transformer during the test. Use an A.C. voltmeter having 1000 ohms per volt or more sensitivity in the following manner: - Connect a 1500 ohm 10 watt resistor, paralleled by a.15 mfd, AC-type capacitor between a known good

earth ground (water pipe, conduit, etc.) and the exposed metallic frame. Measure the A.C. voltage across the combination 1500 ohm resistor and .15 uf capacitor. Reverse the AC connection to the set and repeat AC voltage measurements for exposed metallic frame. Voltage measured must not exceed .3 volts RMS. This corresponds to 0.5 milliamp AC. Any value exceeding this limit constitutes a potential shock hazard and must be corrected immediately.

5. Check for frayed insulation on wires including AC wiring.

Drive Signals

Apply TTL drive signals (see performance specifications) to the 10 pin edge connection on the printed circuit board P-100. The attached schematic details pin functions.

Power Connection

Connect power plug P401 to 115VAC line. Ensure that the line selection switch, SW401, is in the correct position.

Vertical hold

The vertical hold control, R205, normally needs adjustment only when the vertical scan frequency is altered (say 60 to 50Hz field rate). However, should vertical instability occur, the vertical hold control should be centered in its hold-in range.

Scan size

Vertical size is adjusted by control R_{226} and width is adjusted by width coil L_{303} (located to the rear of the left side panel).

Centering

The raster is centered vertically and horizontally on the CRT by rotating the two concentric centering magnets which are part of the yoke assembly. This is a factory adjustment and should normally need set up only for a yoke or CRT replacement.

The video or data information is centered horizontally by centering control R_{304}.

Linearity and geometry

Vertical linearity phase control, R_{227}, is adjusted for equal character height at the top and bottom of the screen while vertical linearity amplitude control, R_{225}, is adjusted for equal character height between the center and the top and bottom extremes of scan.

Horizontal linearity is fixed by polarized linearity coil L_{302} and "S" shaping capacitor C_{312}.

Other linearities and geometries are part of the static yoke compensation.

Brightness

On models wired for a 200K external brightness control, the control is advanced fully clockwise and the Master brightness control, R_{323}, is adjusted for the desired level of maximum brightness or visibility of raster.

Focus

Focus control, R_{320}, is adjusted for optimum focus between the center and corners of a full format of displayed characters for nominal brightness conditions.

High voltage adjust

Control R_{411} is preset to $+70V_{DC}$ at the factory. This setting in conjunction with the width coil setting establishes the EHT at 16.4KV $\pm$ 800V. The +70V setting also ensures operation of the monitor at line voltages as low as $100V_{AC}$.

CIRCUIT DESCRIPTION

POWER SUPPLY

Basic topology of the transformer operated power supply provides for regulated $+70V_{DC}$ for horizontal deflection and video, unregulated $+45V_{DC}$ for the vertical deflection, and $6.1V_{AC}$ for the CRT filament. It's important that the regulated supply be set to +70V rather than for $+75V_{DC}$ where operation down to $100V_{AC}$ line is required.

Full wave bridge rectifiers (D_{401} to D_{404}) and capacitor input filter C_{405A} provide a nominal $+93V_{DC}$ to a series pass regulator circuit. Q_{401} is the series pass element while Q_{403} is its current driver. Q_{404} is the voltage error amplifier that monitors changes in the regulated output (via the divider chain of R_{410}, R_{411}, and R_{412}) versus the 10 volt reference zener voltage of ZD403. Q_{402} and its biasing arrangement of R_{402}, R_{403}, R_{404}, and zener ZD402 form a constant current pre-regulator to minimize ripple in the regulated output voltage.

Nominal current demand on the regulator supply varies between 280 ma. and 350 ma. The configuration of Q_{405} and R_{408} provides for current limiting at a supply current threshold of 650 ma. The additions of resistors R_{406}, R_{407}, and R_{413} modify the current limiting into current foldback for overloads beyond 650 ma. The current foldback is non-latching in nature so that B+ is restored with the removal of the overload fault without the necessity of interrupting primary power.

Unregulated +45 volts for vertical deflection is available at the center tap of the secondary winding. D_{401} and D_{402} effect full wave rectification for this supply while C_{405B} provides filtering. A +7 volt supply for the horizontal drive delay circuit is obtained with the decoupling network of R_{401} and C_{403}.

A separate secondary winding on the power transformer provides $6.1V_{AC}$ for the CRT filament.

The dual winding primary of T401 can be switched by SW401 to parallel-connected windings for 117 volt line operation typical in North America or to a series-connected configuration for 230 volt operation typical in Europe.

VIDEO DRIVE

Positive going video drive at pin 8 of the input PCB edge connector is applied to the base of Q_{101}. Q_{101} and Q_{102} are connected in cascode with the collector signal of Q_{101} driving the emitter of Q_{102}. The base of Q_{102} is DC biased via the 6.2 volt supply of ZD201. Negative going video at the collector of Q_{102} drives the Cathode of the CRT. With full TTL video input, the Q_{102} collector output is typically $25V_{pp}$ with black level at the supply potential of +70V. L_{101}, C_{102}, and R_{102} provide high frequency compensation.

VERTICAL DEFLECTION

The vertical deflection system consists of an inverter stage Q_{201} for the TTL vertical sync drive; a reference sawtooth voltage generator of Q_{202}, Q_{203}, and Q_{204}; and a current feedback output amplifier of Q_{205} through Q_{210}.

Normally negative going TTL vertical sync (as in figure 1) is inverted by Q_{201} to provide a 6 volt positive going sync signal at its collector. The short time constant network of R_{203} and C_{201} differentiates the sync waveform and applies the resulting pulse to the base of Q_{202}. The positive going portion of this waveform that corresponds to the negative going edge of the input vertical sync pulse initiates the vertical scan retrace from the bottom of the CRT screen.

NOTE: Positive going vertical sync input may be used. The positive going portion of the differentiated waveform is then simply displaced from the sync leading edge by the width of the incoming vertical sync pulse (typically 3 horizontal line periods or 190 μsec).

Q_{202} and Q_{203} are normally off during scan with the collector of Q_{202} and the base of Q_{203} at the supply level of 6.6 volts. The positive portion of the differentiated Q_{201} collector sync signal drives Q_{202} (NPN) into conduction so that its collector voltage drops. Q_{203} (PNP) is thus driven into saturation as the base emitter junction of Q_{203} clamps the Q_{202} collector excursion to +5.9 volts. Saturation of Q_{203} brings its collector voltage up close to the emitter B+ level. The positive going pulse that occurs at the collector of Q_{203} (when it is turned on) is transferred to the base of Q_{204} through the network of R_{210} and C_{203}, with C_{203} appearing as an instantaneous short to the leading edge of the pulse. Q_{204} (NPN) is driven into saturation and its collector voltage drops to near zero. Since the emitter circuit of Q_{202} is connected to the collector of Q_{204} via R_{208}, it is also pulled down turning Q_{202} on even harder. This initial sequence is then seen to be regenerative.

Once the positive pulse at the collector of Q_{203} has occurred, C_{203} begins to charge toward the 6.6 volt supply. All three transistors stay in saturation until C_{203} has charged to approximately 6 volts through the low impedances of Q_{203}, R_{210}, and the B-E junction of Q_{204}. This charge time is shorter than the nominal 190 usec duration of the vertical sync pulse.

Once C_{203} has charged, Q_{204} begins to come out of saturation, its collector voltage rising momentarily to 6.2 volts. This positive going polarity on the emitter of Q_{202} biases this stage off followed by Q_{203}. Thus far, the short duration pulse generated at point "A" (figure 1) corresponds to the retrace period in the sequence of vertical scan.

Base and collector currents of Q_{204} now interact with the discharge of C_{203} to produce a linearly decreasing voltage ramp for vertical scan. The topology is typically that of a Miller "run-down" ramp generator - the constant collector current of Q_{204} results in a linearly decreasing voltage across C_{203}. Having Q_{202} and Q_{203} off during scan reduces the possibility of horizontal contamination on the sync line from affecting interlace.

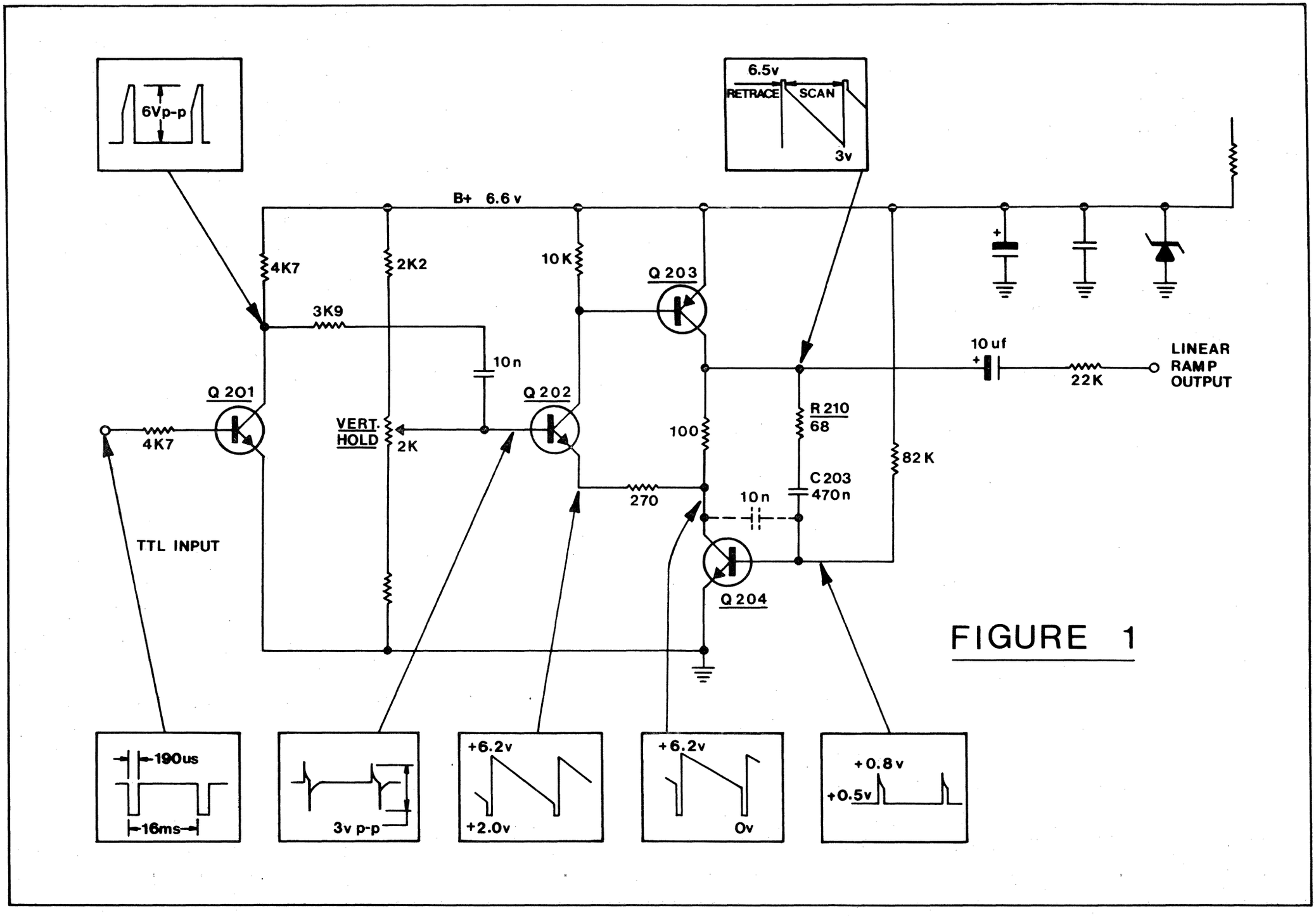

6Vp-p
6.5v
RETRACE
SCAN
3v
B+ 6.6 v
4K7
2K2
10K
Q 203
3K9
10n
10 uf
LINEAR
RAMP
OUTPUT
22K
Q 201
Q 202
R 210
68
VERT.
HOLD
2K
4K7
100
82 K
C 203
470n
270
10n
TTL INPUT
Q 204
190us
16ms
3v p-p
+6.2v
+2.0v
+6.2v
0v
+0.8 v
+0.5v

FIGURE 1

Stages Q_{205} and Q_{206} form a differential amplifier where current feedback moderates the linear voltage ramp for linearity correction and stabilization. The inverted signal at the collector of Q_{205} is applied to the base of Q_{207} (PNP).

Q_{207} through Q_{210} form a conventional quasi-complementary class B amplifier not unlike that found in an audio application. The load however, is the paralleled vertical yoke windings of 25MH inductance and 10 ohms resistance. A sawtooth of current from the amplifier produces a trapezoidal or near square wave of voltage across this inductive/resistive load.

The 110° deflection CRT locates the yoke (center of magnetic deflection) far in front of the center of curvature of the relatively flat faceplate. A linear sawtooth of vertical deflection current, then, would cause scan velocity differences between top/bottom and the center, appearing as linearity distortion. Linearity correction calls for the sawtooth of deflecting current being modified into an "S" shape. Capacitor C_{206} placed in series with the yoke provides a parabola of voltage. The network of R_{225}, C_{207} and double integrator of R_{227}, C_{208}, R_{229}, C_{209} phase shift the parabola to place the "S" correction in the proper time relationship. Control R_{225} varies amplitude of correction while control R_{227} adjusts phase.

Also in series with the yoke is current sense resistor R_{223}. The voltage across this resistor fed back to earlier stages serves to stabilize deflection. R_{226} and R_{224}, in controlling the amount of feedback, provide vertical size adjustment. The network of R_{230} and R_{228} provide for adding the "S" correction voltage and current sense resistor voltage for feedback to the base of Q_{206}. In the differential amplifier the feedback moderates the Miller ramp voltage for the desired end result.

HORIZONTAL DEFLECTION

The V_{17} uses a direct drive horizontal deflection system to process horizontal drive signals. This approach is less susceptible to timing errors due to beam current variations as compared to conventional phase-locked-loop systems. It can also accept a wide variety of data signals without sacrificing performance. When horizontal drive is not present the entire horizontal system becomes inoperative.

1C301, a dual 555 timer circuit, has both sections connected as monostable multivibrators or "one-shots" which produce a fixed delay or timing when triggered by a pulse. The first one-shot accounts mostly for the delay of the horizontal drive by a full horizontal line period. Timing adjustment is determined by R_{304} which is used to position the displayed data information on the center of the raster. The delay accommodates various circuit delays (Q_{302}, Q_{303}) as well as variations in signal format.

The second one-shot is used to generate a near symmetrical square wave which is necessary for proper switching of the horizontal deflection transistor Q_{303}.

Q_{301} accepts a positive-going horizontal drive pulse from pin 6 of the PCB connector and inverts it. The negative going edge appearing at Q_{301} collector triggers the first one-shot at pin 6. Overall timing of the first one-shot is determined by R_{304}, R_{305}, and C_{302}. The output at pin 5 consists of a pulse whose negative going edge corresponds

to the delayed-horizontal drive. This edge toggles the second one-shot at pin 8.

The second one-shot, whose timing is fixed by R_{307} and C_{306}, produces a pulse at output pin 9 of near symmetrical duty cycle. Q_{302} saturates when this pulse is positive and cuts off when it is near zero. T_{301} amplifies the collector current of Q_{301} to provide the necessary high base current (1.3A) for the horizontal deflection transistor Q_{303}.

Horizontal deflection is accomplished in a standard shunt efficiency flyback circuit.

Flyback T302 and D_{303} produce $17KV_{DC}$ for the CRT second anode. D_{301} rectifies the primary retrace pulse to supply $+500V_{DC}$ to the brightness, focus, and G_2 circuits. D_{304} rectifies a negative flyback pulse to provide a $-80V_{DC}$ supply for the brightness control circuit.

When power is switched off the negative supply is maintained by C_{313}. As the +500 volt supply falls, ZD301 drops out of its zener mode and isolates the brightness circuit from discharging C_{313} rapidly. The full $-80V_{DC}$ potential appears at G_1 ensuring that the picture tube is cut off until the filament and cathode cool sufficiently to eliminate any emission and possible phosphor burn.

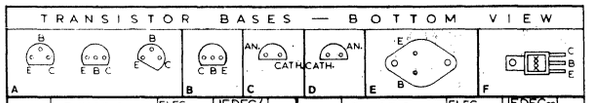
Circuitry is protected from CRT arcing by spark gaps integral in the cathode and grid leads of the CRT socket. Arc energy is thus returned to the aquadag. Current limit resistors are also located in all grid and the cathode leads.

X-RADIATION HOLD DOWN CIRCUIT

An increase in B+ could lead to an increase in high voltage and X-ray emission. An x-ray protection circuit, consisting of ZD101, prevents triggering of the first "one-shot" in IC301 in the event of an increase in B+ to 82 volts $\pm$2% by pulling pin 6 positive beyond its trigger threshold. Once ZD101 is biased into its zener mode the entire horizontal system stops and no further high voltage is produced until the B+ fault is corrected.

V17 SCHEMATIC

TRANSISTOR BASES — BOTTOM VIEW



sym	FUNCTION	ELEC. PART No.	JEDEC/ HOUSE No.	type
Q101	VIDEO PREAMP	14-800-32	MPS6514	A
Q102	VIDEO OUTPUT	14-904-12	MPS U10	F
Q201	VERTICAL PREAMP	14-802-12	TIS 98	A
Q202	VERT & TRIGGER	14-802-12	TIS 98	A
Q203	MILLER INTEGRATOR	14-808-12	TIS 101	A
Q204	MILLER INTEGRATOR	14-822-12	TIS 97	A
Q205	DIFFERENTIAL AMP	14-811-32	SPS 5449	B
Q206	DIFFERENTIAL AMP	14-802-12	TIS 98	A
Q207	VERT DRIVER	14-861-12	S 24615	A
Q208	VERT DRIVER	14-861-12	S 24615	A
Q209	VERT OUTPUT	14-601-23	SJ 5461	E
Q210	VERT OUTPUT	14-601-23	SJ 5461	E
Q301	TRIGGER AMP	14-802-12	TIS 98	A
Q302	HORIZ DRIVER	14-904-12	MPSU10	F
Q303	HORIZ OUTPUT	14-601-36	2SC1413	E
Q401	REGULATOR	14-601-26	2N5240	E
Q402	PRE-REGULATOR	14-823-32	2N5400	B
Q403	REG. DRIVER	14-904-12	MPSU10	F
Q404	ERROR AMP	14-904-12	MPSU10	F
Q405	CURRENT LIMITER	14-802-12	TIS 98	A

sym	FUNCTION	ELEC. PART No.	JEDEC/ HOUSE No.	type
IC301	HORIZ DELAY	14-2029-01	MC 3456	
		14-514-14	IN 914	
D301	VERT BIAS	14-514-23	BY 184	
D302	FOCUS RECTIFIER	28-22-25	DG 1	
D303	FLYBACK DAMPER	28-42-01	H1802	
D304	EHT RECTIFIER	28-22-27	IN 5061	
D401	B- FOCUS SUPPLY	28-22-27	IN 5061	
D402	B+ POWER SUPPLY	28-22-27	IN 5061	
D403	B+ POWER SUPPLY	28-22-27	IN 5061	
D404	B+ POWER SUPPLY	28-22-27	IN 5061	
	B+ POWER SUPPLY			
ZD101	82V HOLD DOWN ZEN.	14-515-64	0.5MBZ52	
ZD201	6.2V ZENER B+	14-515-66	IN5234B	
ZD301	25V SPOT KILL. ZEN.	14-515-36	IN5869B	D
ZD402	5.1V REF. ZENER	14-515-44	IN 751A	
ZD403	10V REF. ZENER	14-515-45	IN 4740A	

P100 INPUT CONNECTOR (TOP VIEW)

1. HORIZ GROUND
2. BRIGHTNESS HI
3. BRIGHTNESS LOW
4. BRIGHTNESS ARM
5. ——
6. HORIZ DRIVE
7. B+ 74V (IF USED)
8. VIDEO OUTPUT
9. VERT DRIVE
10. GROUND

RESISTORS – RESISTANCE IN OHMS, k (KILOHMS), OR M (MEGOHMS) 1/4 WATT, 5% TOLERANCE UNLESS OTHERWISE NOTED.
CAPACITORS – CAPACITY IN p(PICOFARADS), n(NANOFARADS), OR µ(MICROFARADS) D.C.W.V. AND TOLERANCE NOTED WHERE CRITICAL.

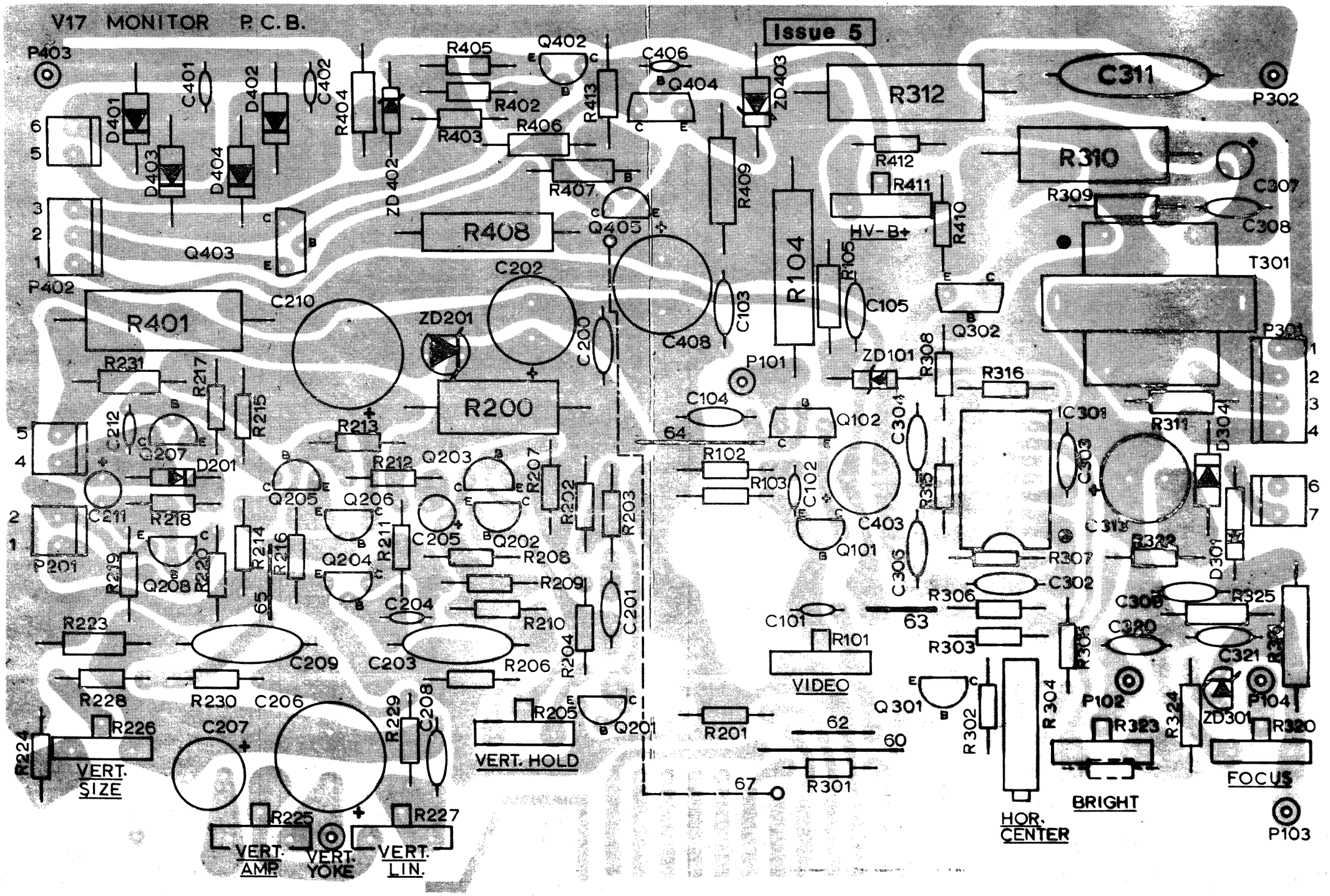
CAUTION FOR CONTINUED SAFETY REPLACE COMPONENTS INDICATED BY ⚠ WITH EXACT REPLACEMENT PARTS ONLY. CONSULT SERVICE MANUAL PARTS LIST SECTION "SAFETY COMPONENTS"

✳ DEPENDS ON CONTROL SETTINGS AND / OR SIGNAL CONDITION.

P 401
POWER CONNECTOR (PLUG SIDE)

V17 MONITOR P.C.B.

Issue 5



SERVICE REPLACEMENT PARTS LIST

CHASSIS ASSEMBLY (02-210233-03)*

SYMBOL	DESCRIPTION	PART NUMBER
Q 209	Vertical Output Transistor, SJ5461	14-601-23
Q 210	Vertical Output Transistor, SJ5461	14-601-23
Q 303	Horizontal Output Transistor, 2SC1413	14-601-36
Q 401	Regulator Power Transistor 2N5840 select.	14-601-26
D 302	Damper Diode, DG1	28-22-25
D 303	HV Rectifier 30KV, H1802	28-42-01
F 401	.75A 125V Fuse	27-5-28
L 101	10 MH Coil	21-1400-06
L 302	Linearity Coil	21-1428-01
L 303	Width Coil	21-1427-01
L 304	Deflection Yoke	21-244-01
T 302	Flyback Transformer	21-243-01
T 401	Power Transformer	24-10197-03
SW 401	Line Switch	26-230-01
	Heat-shrinkable Sleeving, .187 ID	20-300013-04
	Heat-shrinkable Sleeving, .750 ID	20-300013-08
	Cable Tie	33-523-01
	Clip - PCB Support	33-629-01
	Fuse Holder	34-198-01
	CRT Socket	34-213-11
TS1, 2	Terminal Strip, Fire Retardent	34-491-03
	Transistor Socket	34-515-03
P 201	Connector Housing	34-549-05
P 402	Connector Housing	34-549-06
P 301	Connector Housing	34-549-07
	Crimp Terminal	34-550-01
	Anode connector with spring	34-678-01
P 401	Power connector housing	34-677-06
	Pin Terminal	34-676-21
	Transistor Cover	39-1151-01
C 405	Electrolytic 470, 470 uF/150, 75v	44-202-37
C 314	10 NF 400v capacitor	48-121034-01
C 312	820 NF 200v capacitor	49-19-26
C 310	4N7 1600v Safety Cap	49-24-06

* Not a replacement or stock item

MONITOR PCB ASSEMBLY

SYMBOL	DESCRITPION	PART NUMBER
D 201	Signal Diode, 1N914	14-514-14
D 301	Signal Diode, 1800 Piv, BY 184	14-514-23
D 304, 401, 402, 403, 404	Rectifier 1A 600v, 1N5061	28-22-27
ZD 101	82v 2% Zener Diode, 0.5M82ZS2	14-515-64
ZD 201	6.2v Zener Diode, 1N5234B	14-515-66
ZD 301	25v 5% Zener Diode, 1N5869B	14-515-36
ZD 402	5.1v 5% Zener Diode, 1N751A	14-515-44
ZD 403	10v 5% Zener Diode, 1N4740A	14-515-45
Q 101	Small Signal Transistor, MPS 6514	14-800-32
Q 201, 202 206, 301 405	Small Signal Transistor, T1S 98	14-802-12
Q 203	Small Signal Transistor, T1S101	14-808-12
Q 205	Small Signal Transistor, SPS5449	14-811-32
Q 204	Small Signal Transistor, T1S97	14-822-12
Q 402	Small Signal Transistor, 2N5400	14-823-32
Q 207, 208	Small Signal Transistor, S24615	14-861-12
Q 102, 302 403, 404	Plastic Power Transistor, MPSU10	14-904-12
IC 301	Double one-shot IC, MC3456	14-2029-01
T 301	Horizontal Buffer Transformer	24-170001-04
R 304	Cermet Trim Pot 2K	41-328-01
R 226	Carbon Trim Pot 200R	41-299-16
R 205, 225 411	Carbon Trim Pot 2K	41-299-12
R 227	Carbon Trim Pot 20K	41-299-01
R 320, 323	Carbon Trim Pot 2M5	41-299-07
R 408	Critical Safety Resistor, 3R3 5% 2W	42-63-54
R 312	15R 4W 10% Resistor	42-111501-03
R 310	1K 4W 10% Resistor	42-111021-03
R 104	1K2 4W 10% Resistor	42-111221-03
C 307	1uF 100v Electrolytic	44-310508-01
C 205, 211	10 uF 10v Electrolytic	44-310002-01
C 313	22 uF 150v Electrolytic	44-322009-05

SYMBOL	DESCRIPTION	PART NUMBER
C 408	47 uF 100v Electrolytic	44-347008-08
C 403	100 uF 25v Electrolytic	44-310104-04
C 207	100 uF 16v Electrolytic	44-310103-12
C 210	100 uF 100v Electrolytic	44-310108-06
C 202	470 uF 10V Electrolytic	44-347102-04
C 206	1000 uF 25v Electrolytic	44-310204-10
C 212	100 pF 25p 10% 50v Capacitor	46-310113-51
C 102	120 pF 5% Mica Capacitor	47-41215-05
C 204	10NF 10% Polypropelene Capacitor	48-131031-11
C 406	68 pF 10% 500v Capacitor	46-368013-02
C 401, 402	1NF 10% 25P 500v Capacitor	46-310213-06
C 320, 321	1NF 20% Z5V 1500v Capacitor	46-510228-74
C 309	10NF 1kv Capacitor	46-510311-37
C 308	1.5NF 100v Mylar Capacitor	48-171521-22
C 200, 303, 304, 201	10NF 10% 200v Mylar Capacitor	48-171032-22
C 103, 306	22NF 10% 200v Mylar Capacitor	48-172232-22
C 104, 105	100NF 10% 200v Mylar Capacitor	48-171042-22
C 208	220NF 10% 200v Mylar Capacitor	48-172242-22
C 203, 209	470NF 10% 200v Mylar Capacitor	48-174742-22
C 311	2.2, uF 20% 200v Mylar Capacitor	48-172252-51
C 302	10NF 5% Polypropelene Capacitor	48-181032-04
	Monitor P.C.B. (less components)	50-1568-01

SAFETY COMPONENTS

For continued reliability and safety, the following components should be replaced with Electrohome parts:

V 101	Picture tube, 15"	17-6152-03 or -04
R 104	1k2 4W Wirewound Resistor	42-111221-03
ZD 101	82v 2% Zener Diode	14-515-64
R 231	330R .5W 5% Carbon Comp. Res.	40-223315-13
R 310	1K 4W Wirewound Resistor	42-111021-03
R 312	15R 4W Wirewound Resistor	42-111501-03
C 310	4N7 1600v Critical Safety Cap.	49-24-06
T 302	Flyback Transformer	21-243-01
L 304	Deflection Yoke	21-244-01
F 401	.75A 125v slow-blow Fuse	27-5-28
T 401	Power Transformer	24-10197-03
SW 401	Line Switch	26-230-01
R 401	1k8 2W 5% Resistor	40-621825-01
R 408	3R3 2W 5% Resistor	42-63-54

All safety components are marked with △ on the schematic.