VIEWFINDER

LDK 4802/00

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A. TECHNICAL DATA

TV standard:
CCIR 625 lines, 25 fields
EIA 525 lines, 30 fields

Supply voltage:
220 V a.c. ± 10 %

Power consumption:
45 Va

Input signals:
1 x VBS, positive, 1 Vp-p nominal into 75 Ω, or 1 x VB, positive, 0.7 Vp-p nominal into 75 Ω
Minimum 0.3 Vp-p (VB) or 0.45 Vp-p (VBS)
1 x comp. sync signal (S) negative, 0.5 - 4.5 Vp-p into 75 Ω.

Frequency response:
flat up to 5 MHz ± 0.2 dB,
-3 dB at 7 MHz or higher.

Peaking:
+ 7.5 dB at approx. 5 MHz

Differential gain:
< 5 % at 30 Vp-p on the amplifier output

Resolution:
better than 500 lines in the centre of the picture at a brightness of 850 Nits = 250 ft Lambert.

Geometry:
measured with a test pattern with circles ± 1 % and ± 2 % of the picture height and an electronic test pattern (14 x 19 lines):
In a circle with a diameter equal to the picture height the intersections of the electronic test pattern fall within the 1 % circles. Outside this circle the intersections fall within the 2 % circles. The deviation between three successive sections of the test pattern is more than + 1 % to -1 %.

Maximum brightness:
measured with half black - half white picture. 850 to 1000 Nits = 250 - 300 ft Lambert.

Picture tube:
7" type MW17-16 W

High tension:
16 kV, stabilised, isolated from the horizontal output stage.

Picture size:
120 x 90 mm (7" diameter)

Deflection:
continuously variable in both directions: ± 5 %

Dimensions:
height: 200 mm (7 7/8")
length: 435 mm (17 7/8")
width : 235 mm (9 2/8")

Weight:
approx. 8 kg (17.6 lbs)

B. CHECKING AND ADJUSTING

1. Adjusting elements

a. contrast
b. brightness } external controls
c. focusing

d. vert. hold
e. vert. ampl. } on the side panel of viewfinder, accessible via holes in the cover plate.
f. vert. lin 2 x

g. hor. hold
h. hor. ampl. } accessible from the top of the viewfinder via holes in the screening cover of the HT cage.
j. hor. lin

2. Supply circuits

a. Remove p.c. boards U3 and U4 from the H.T. cage. Take the tube socket from the picture tube.
b. Unsolder the connection wires from soldering tags g-h and o of p.c. board U1. Connect a variable load resistor of 8.5 - 22 Ω, 35 W between tags g and l. Adjust the resistance to 22 Ω.
c. Connect an accurate voltmeter across the resistor (- pole to tag 1). Apply a voltage of 220 V a.c. to the viewfinder. Select such a value for R119 that the voltage across the load resistor is 17.25 ± 0.2 V.
d. When the load resistance is varied from 8.5 to 20 Ω the voltage should not vary more than 0.15 V. This also applies to mains voltages of 208 and 234 Va.c. At constant load and when the mains voltage is varied from 208 to 234 V a.c. the voltage should not vary more than 0.15 V.
e. At minimum mains voltage and a load resistance of 8.5 Ω the noise and ripple voltage should be ≤ 15 mV.

For adjusting the 47 V supply, the 17 V supply should be correctly adjusted.

a. Disconnect the wires from tags g-h and o.
Connect a 22 Ω, 15 W resistor between g and l and a load resistor of 780 Ω - 3 W between o and m.
Remove p.c. boards U3 and U4.
b. Apply a mains voltage of 220 Va.c. Select such a value for R101 that the voltage measured on tag o is 47 V ± 0.5 V.
When the 780 Ω resistor is disconnected, the voltage should not vary more than 0.15 V.
With the 780 Ω resistor connected and at a mains voltage variation from 208 V to 234 V a.c. the voltage should not vary more than 0.15 V.
At 208 V mains voltage and with the 780 Ω resistor connected the noise and ripple should be < 15 mVp-p.
c. Remove the load resistors and reconnect the wires.

3. Vertical time base

Setting of output transistor TS218

a. Connect the collector of TS216 direct to earth. Connect an ammeter between the collector of TS218 and soldering tag U.

b. Select such a value for R263 that the collector current of TS218 is 180 ± 10 mA.

4. Video amplifier

a. Apply no signal to the video input.

b. Select such a value for R212 that a direct voltage of 2 to 2.5 V is measured across R214.

c. Apply a video wobble signal to the video input.
Connect an oscilloscope to the emitter of TS206.
Adjust C205 to obtain a curve which is flat within 0.2 dB up to 5 MHz.
At 7 MHz the max. attenuation should be 0.5 dB.

d. Remove the tube socket from the picture tube.
Connect the measuring probe of the oscilloscope to pin 7 of the tube socket via a capacitor. The value of this capacitor should be such that the series connection of the capacitor and the probe capacitance represents a value of 5 pF (= capacitance cathode picture tube).
For a 10 MΩ//8 pF probe the capacitor should be 13 pF.

e. Switch on the peaking.
Adjust the amplitude of the wobble signal so that the signal is not clipped.
Adjust the core of L202 so that the peak of the curve lies at 5 MHz.

f. Switch off the peaking.
Adjust L203 so that the curve is flat within 0.3 dB up to 5 MHz. Max. attenuation at 7 MHz: 1 dB.
L203 can also be adjusted for minimum overshoot the pulse signals.
The frequency response then gradually decl

5. High tension 16 kV

a. Set contrast and brightness to minimum.

b. Connect an h.t. meter to the final anode of the picture tube.

c. Adjust R308 for a high tension of 16 kV.

d. Increase the load of the H.T. generator to approx. 200 μA (= 0.2 V across cathode resistor R6).
The variation of the high tension should then be max. 100 V. If the variation is too high the stability should be adjusted with R318.
As the adjustments of R308 and R318 affect each other, both adjustments should be repeated a few times.

C. CIRCUIT DESCRIPTION

1. Video section, p.c. board U2

The video signal is applied to contrast control R4 via the connection plug. The video circuit is terminated with R3//R4 = 75 Ω. TS201-202 is an amplifier; C205 serves for adjusting the frequency response.
Via emitter follower TS203 the signal is applied to clamping circuit TS204-205. TS204 is conductive when the signal is negative during the clamping interval, TS205 when it is positive. After emitter follower TS206 output stage TS207 has been included. The collector impedance is formed by R214//R215 in series with correction coil L202; and L203 in series with GR204 and TS208.
In the normal condition diodes GR201, 202, 203, 204 and TS208 are conductive; L202 is then parallel-connected to L203.
Coil L203 serves for peaking. TS208 is conductive when R218 is earthed via the peaking switch. When the switch is open, TS208 is cut off and L202 is no longer connected in parallel with L203. The self-inductance of the collector circuit of TS207 increases so that high-frequency video components are boosted.
Diode GR204 is connected in series with TS208. When this transistor would be cut off the collector-emitter capacitance of TS208 would form a series tuned circuit with L203. With GR204 the collector-emitter capacitance is connected in series with the diode capacitance so that the overall capacitance is reduced. The resonant frequency of the series tuned circuit then falls outside the desired frequency band.
For high frequencies voltage Vcb of TS208 might exceed the max. permissible value on account of oscillations due to L203. This is also prevented by GR204 being cut off. If L202 were connected direct to the supply circuit, there would be no voltage across GR204 + TS208 so that TS208 could not be bottomed. However, the reverse voltage of diodes GR201-202-203 is present across TS208 + GR204 so that TS208 can become conductive.
Diodes GR205-206 serve for white clipping. The clipping level has been adjusted to approx. 7.5 V with SP201-202. Voltage surges on the collector of TS207 on account of flash-over in the picture tube are avoided with spark traps VL2 and VL3, connected to the cathode and Wehnelt cylinder of the picture tube.

2. Time base

To TS209 on p.c. board U2 either the sync signal or the VBS signal is applied. Selection is effected by resoldering a wire (d-f or d-g).

TS209 clips the signal; TS210 is only conductive during the peaks of the sync signal.
From the collector of TS210 the signal is applied to the vertical and horizontal time bases. The sync. signal is differentiated by C213-R226 and integrated by R227-C214 so that the pulses on the collector of TS211 are delayed.
Via inverter stage TS212 the pulses control clamping circuit TS204-205. The sync. signal is integrated by R234-C217.
On the collector of TS213 only the vert. sync pulse is present which via C219 synchronises multivibrator TS214-215.
R238 is the vert. sync control. Via GR208-209 and R245, capacitor C223 is rapidly charged to a positive value; R245 limits the charging current. During the forward scan TS214 is cut off. GR208-209 are then also cut off, because C223 is positive. C223 discharges via R246-244-243.
The discharge depends on R244, which is the picture height control. R247-C224-R248 provide linearity correction.
The sawtooth voltage is amplified by TS216. The sawtooth voltage on the emitter results in a sawtooth current into C222. Across C222 a parabolic voltage arises which is adjustable with R249 (vertical linearity). Via emitter follower TS217 output transistor TS218 is controlled. T2 is a choke which is coupled to the deflection coil via C230.
From the deflection coil the deflection current flows to R260 and thus drives TS216 (current feedback). R263 has been selected so that the voltage on the emitter of TS218 is 1.7 V. As a result the setting of TS218 becomes independent of tolerances. This ensures proper temperature stability of the output transistor.
Via the H.T. plug the sync signal reaches phase discriminator GR401-402 on p.c. board U4. To the junction of GR401-402 a sawtooth voltage of line frequency is applied.
The flyback pulse from the output stage drives TS406.
During the pulse TS406 is conductive and charges capacitor C409 via R415. When TS406 is cut off, capacitor C409 discharges via R414.
The control voltage from the phase discriminator controls multivibrator TS404-405 via TS402-403. Filter C404-R407 is a jitter filter. The frequency of the multivibrator is adjusted with R502 (p.c. board U5) which via GR402-401 also determines the control voltage.
Via driver stage TS306 the multivibrator controls horizontal output stage TS301 and H.T. generator TS302-303-304-305.
One side of the deflection coil is connected to booster diode GR302, the other side to the linearity control (point c).
The flyback time is determined by C305 and C306.
GR301 is a rectifier which is conductive during the forward scan. On C304 a direct voltage arises, which is added to the supply voltage. This is necessary because the output stage requires a supply voltage which is some volts higher than the +17 V.
With R301 the effect of the rectifier circuit and, as a result, the horizontal amplitude is adjusted.

3. High tension

The high tension is generated in a separate generator. Transistor TS302 is an output transistor, GR303 is a booster diode. Via TS303 transformer T2 is connected to the supply voltage. TS303 is controlled by rectifier TS304 and TS305. The flyback pulse is rectified by GR304; the resulting direct voltage controls TS305. When the load increases, the pulse voltage decreases.
The base of TS305 becomes less positive and TS305-304-303 become more conductive and supply more current to the transformer so that the pulse voltage increases again.
The value of the high tension is adjusted with R308.
The current from the h.t. coil flows through R318. With R318 the effect of the current on the h.t. can be adjusted, i.e. the internal resistance.
The pulse from the h.t. winding is rectified in unit U4.
The voltage on C602 is used for the focusing potentiometer. Via GR602 and 603 the voltage is transferred from C602 to C603. The pulse voltage rectified by GR603 is added to this voltage, so that a voltage of approx. 15 kV is obtained.
The pulse on the collector of TS302 is rectified by GR307. The rectified voltage is applied to the focusing potentiometer and also serves as signalling voltage for the scan protection circuit.
With GR306 and GR305 a pulse derived from C307-C308 is rectified. The pulse amplitude therefore depends on the horizontal deflection current. With GR306 the peak of the pulse is clamped at the level of the voltage on C319. After this, the pulse is rectified with GR305. The rectified voltage controls the scan protection circuit.

4. Flyback suppression and scan protection circuit

Flyback suppression for the picture tube is obtained by mixing pulses obtained from the vertical and horizontal output stages on the collector of TS108 (p.c. board U1).
The vertical pulse is applied via C113.
The width of the vertical pulse on the collector of TS108 is determined by the value of C114. The horizontal pulses are applied via C111-R126. From C112 the peaks of the pulses are clamped at the level of the voltage on brightness control R1 with the aid of GR108. Via R125 the pulses and the brightness control voltage are applied to the Wehnelt cylinder of the picture tube.
The deflection failure protection is only operative for the

horizontal deflection. This is necessary because the high tension is not derived from the horizontal output stage. Horizontal deflection failure would cause a vertical line on the picture tube. The vertical deflection is relatively slow with respect to the horizontal deflection. As a result a vertical line will burn in much sooner than a horizontal line. To the emitter of TS107 a voltage of -68 V is applied, to the base a voltage of -72 V; TS107 is cut off and the anode of GR108 then has the same voltage as the brightness control. When the horizontal deflection fails, no pulse voltage is applied to the base of TS107 via GR306-305. On account of the reverse voltage of GR306-305 the base of TS107 will nevertheless become positive with respect to the emitter. This is sufficient to drive TS107 into saturation. The voltage on the collector now becomes approx. -66 V and via GR109 this voltage reaches the anode of GR108 and cuts off the picture tube. GR109 prevents that, when TS107 is cut off, the negative parts of the flyback suppression pulses exceed the max. permissible voltage between the collector and base of TS107.

5. Supply section

The supply section consists of two parts: a 17 V supply and a 47 V supply.
The 17 V circuit is supplied by rectifier GR104-107.
TS1 is the series regulator. To reduce the dissipation in transistor TS1, part of the current for the supply is applied via R111-R112. TS1 is driven via differential amplifier TS105-106 and emitter follower TS104. SP105-106 supply the reference voltage. The supply voltage for TS106 is stabilised by means of SP101-102. The 17 V supply serves as a reference for TS102 in the 47 V supply section.
GR102 limits the V_{be} of TS102. This transistor drives series regulator TS101.

D. SERVICE PARTS

1. Mechanical

Screening plate near H.T. connection picture tube	4822 466 90538
Cover plate with text on viewfinder side	4822 455 50012
Nut for potentiometers FOC-CONTRAST-BRILLIANCE	4822 505 10421
Socket for CRT	4822 267 60023
Plug for CRT	4822 265 40061
Valve holder CRT	4822 255 70038
Socket connector for connection of viewfinder and p.c. board U3	4822 267 50028
Connector for p.c. board U3	4822 265 40026
Plug for deflection coils	4822 265 40025
Socket for deflection coils	4822 267 50027
Cap for deflection coils	4822 268 40004
H.T. pin contact in the above-mentioned plugs and sockets	4822 268 10026
H.T. socket contact in the above-mentioned plugs and sockets	4822 268 20006
Co-axial contact for the above-mentioned plugs and sockets	4822 265 10005
Perpendicular co-axial contact for connector of p.c. board U3	4822 264 10038
Nylon spacers for transistors	4822 255 40006

2. Electrical

a. Printed circuit board U1

Item Pos.	Description	Code number
TS101-104-108	BFY50 Silicon transistor NPN	4822 130 40294
TS102-105-106	BCY56 Silicon transistor NPN	4822 130 40325
GR101-102-108-109	BA148 Silicon diode	4822 130 30256
GR103	BY123 Silicon rectifier	4822 130 30279
GR104-105-106-107	BYX30-200 Silicon diode	4822 130 30351
SP101-102	BZY88/C8V2 Silicon zener diode	4822 130 30285
SP103-104	BZY53 Silicon zener diode	4822 130 30246
SP105-106	BZY78 Silicon zener diode	4822 130 30335
VL101	Safety fuse 2 A delayed action	4822 253 30025
C101-103	32 µF, 64 V, Electrolytic	4822 124 20363
C102	5 µF, 64 V, Electrolytic	4822 124 20347
C104-105	400 µF, 40 V, Electrolytic	4822 124 20404
C106	640 µF, 25 V, Electrolytic	4822 124 20413
C107	32 µF, 10 V, Electrolytic	4822 124 20368
C108-112-113	0.1 µF, 100 V, Polyester	4822 121 40059
C109	64 µF, 5 V, Electrolytic	4822 124 20098
R107	1 kΩ, 5.5 W Wire wound	4822 112 20107
R111	27 Ω, 5.5 W Wire wound	4822 112 20065
R112	33 Ω, 5.5 W Wire wound	4822 112 20067

b. Printed circuit board U2

Item Pos.	Description	Code number
TS201-205-210-211-217	BCY56 Silicon transistor NPN	4822 130 40325
TS206-208-209-212-216	BCY70 Silicon transistor PNP	4822 130 40324
TS207	BFY50 Silicon transistor NPN	4822 130 40294
TS218	BDY20 Silicon transistor NPN	4822 130 40449
GR201-204-207-210	BAY38 Silicon diode	4822 130 40256
GR205-206	BAX16 Silicon diode	4822 130 30273
SP201-202	BZY88/C4V7 Silicon zener diode	4822 130 30264
C201-203-210-212	32 µF, 10 V, Electrolytic	4822 124 20368
C202	80 µF, 25 V, Electrolytic	4822 124 20384
C204-224	5 µF, 64 V, Electrolytic	4822 124 20347
C205	60 pF, Trimmer	4822 124 50017
C206-209-211	0.47 µF, 100 V, Polyester	4822 121 40175
C207	400 µF, 25 V, Electrolytic	4822 124 20038
C208	80 µF, 2.5 V, Electrolytic	4822 124 20031
C216	160 µF, 25 V, Electrolytic	4822 124 20053
C217	22 K , 250 V, Polyester	4822 121 40045
C218	10 µF, 16 V, Electrolytic	4822 124 20077
C219	2K7 , 125 V, Polyester	4822 121 50435
C220	0.15 µF, 100 V, Polyester	4822 121 40231
C221	15 K , 250 V, Polyester	4822 121 40049
C222	12 µF, 25 V, Electrolytic	4822 124 10059
C223	3.3 µF, 100 V, Polyester	4822 121 40184
C225-227	125 µF, 16 V, Electrolytic	4822 124 20078
C226	47 K , 100 V, Polyester	4822 121 40055
C228	100 µF, 6.4 V, Electrolytic	4822 124 20046
C229-230	1000 µF, 16 V, Electrolytic	4822 124 20116
R219	75 Ω 1 % 1/8 Carbon	4822 111 20002
R238-244-248	10 kΩ lin Potentiometer	4822 100 10096
R249	500 Ω lin Potentiometer	4822 100 20021
L202	Correction coil	4822 156 10341
L203	Correction coil	4822 156 10342

c. Printed circuit board U3

Item Pos.	Description	Code number
TS301-302	AU104 Germanium transistor PNP	4822 130 40458
TS303	BDY20 Silicon transistor NPN	4822 130 40449
TS304-306	BFY50 Silicon transistor NPN	4822 130 40294
TS305	BCY70 Silicon transistor PNP	4822 130 40324
GR301-303	BYX30-200 Silicon diode	4822 130 30351
GR304-307	BA148 Silicon diode	4822 130 30256
GR305-306	BAY38 Silicon diode	4822 130 40256
SP301	BZY78 Silicon zener diode	4822 130 30335
C301	160 µF, 25 V, Electrolytic	4822 124 20053
C303-304	22 µF, 25 V, Electrolytic	4822 124 20054

Item Pos.	Description	Code number Code-Nummer
C305-306	36 K , 250 V Polyester	4822 121 40052
C307-308	4.7 µF, 100 V Polyester	4822 121 40083
C309-316	640 µF, 25 V Electrolytic	4822 124 20413
C310-313	120 µF, 16 V Electrolytic	4822 124 10069
C314-321	24 K , 125 V Polyester	4822 121 50436
C315	0.22 µF, 100 V Polyester	4822 121 40232
C317	27 K , 100 V Polyester	4822 121 40053
C318	47 K , 100 V Polyester	4822 121 40055
C319	6.4 µF, 150 V Electrolytic	4822 124 20059
C320	10 µF, 16 V Electrolytic	4822 124 20077
C323	5 µF, 64 V Electrolytic	4822 124 20347
R301	10 Ω 4 W Potentiometer	4822 103 30094
R308-318	10 kΩ lin Potentiometer	4822 100 10096
L301	Choke	4822 157 50612
T301	Line transformer	4822 140 10113
T302	Driver transformer	4822 142 50106
T303	H.T. transformer	4822 145 70036

d. Printed circuit board U4

Item Pos.	Description	Code number
TS401-403	BCY56 Silicon transistor NPN	4822 130 40325
TS404-406	BCY70 Silicon transistor PNP	4822 130 40324
GR401-404	BAY38 Silicon diode	4822 130 40256
C401	0.1 µF, 100 V Polyester	4822 121 40059
C402-403-405	10 K , 250 V Polyester	4822 121 40047
C404-408	0.68 µF, 100 V Polyester	4822 121 40233
C406	8K2 , 63 V Polyester	4822 121 50281
C407	3K9 , 63 V Polyester	4822 121 50089
C409	47 K , 100 V Polyester	4822 121 40055

e. Printed circuit board U5

Item Pos.	Description	Code number
L501	Linearity control	4822 150 50035
R502	10 kΩ lin Potentiometer	4822 100 10096

f. Unit U6

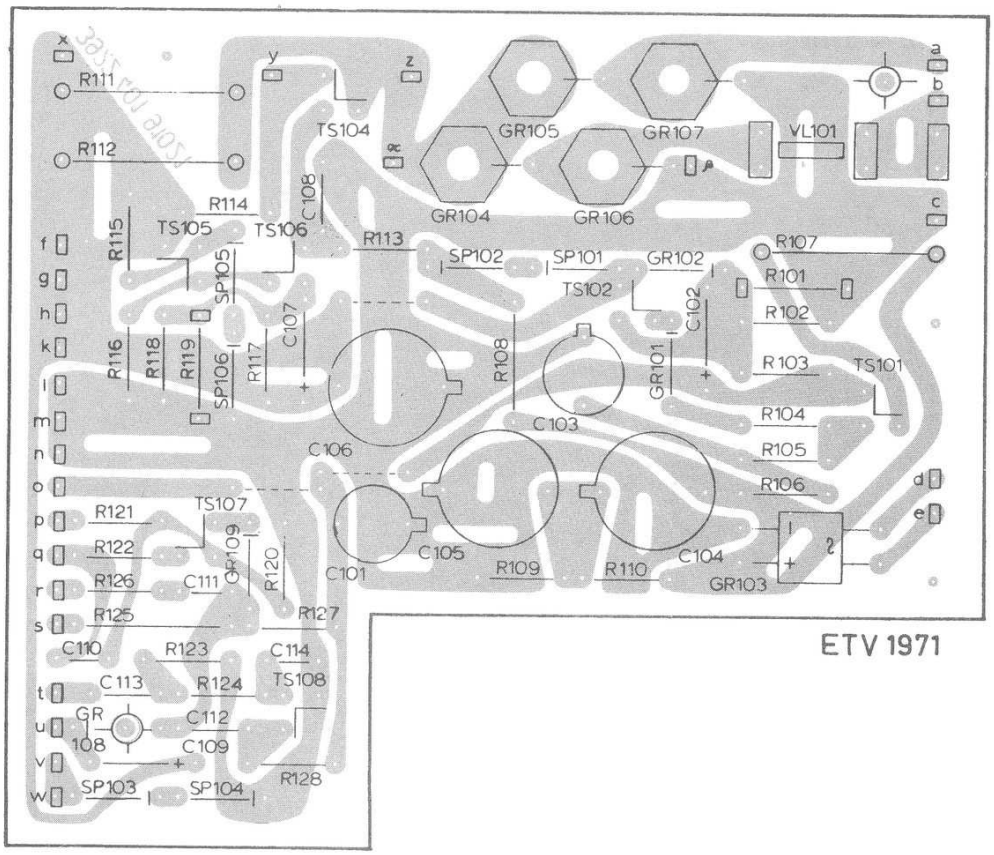
	H.T. rectifier	4822 219 80085

g. Components not mounted on p.c. boards

B1		MW17-141W
VL2-3	Spark trap	4822 252 60014
TS1	BDY20 Silicon transistor NPN	4822 130 40449
C1	5600 µF, 40 V Electrolytic	4822 124 70056
C2-3	22 K , 1000 V Polyester	4822 121 40229
R1	10 K lin. Potentiometer	4822 101 20062
R2	2M2 lin. Potentiometer	4822 101 20066
R4	300 Ω lin. Potentiometer	4822 101 20078
R6	1 K 5.5 W Coil	4822 112 20107
T1	Supply transformer	4822 146 60062

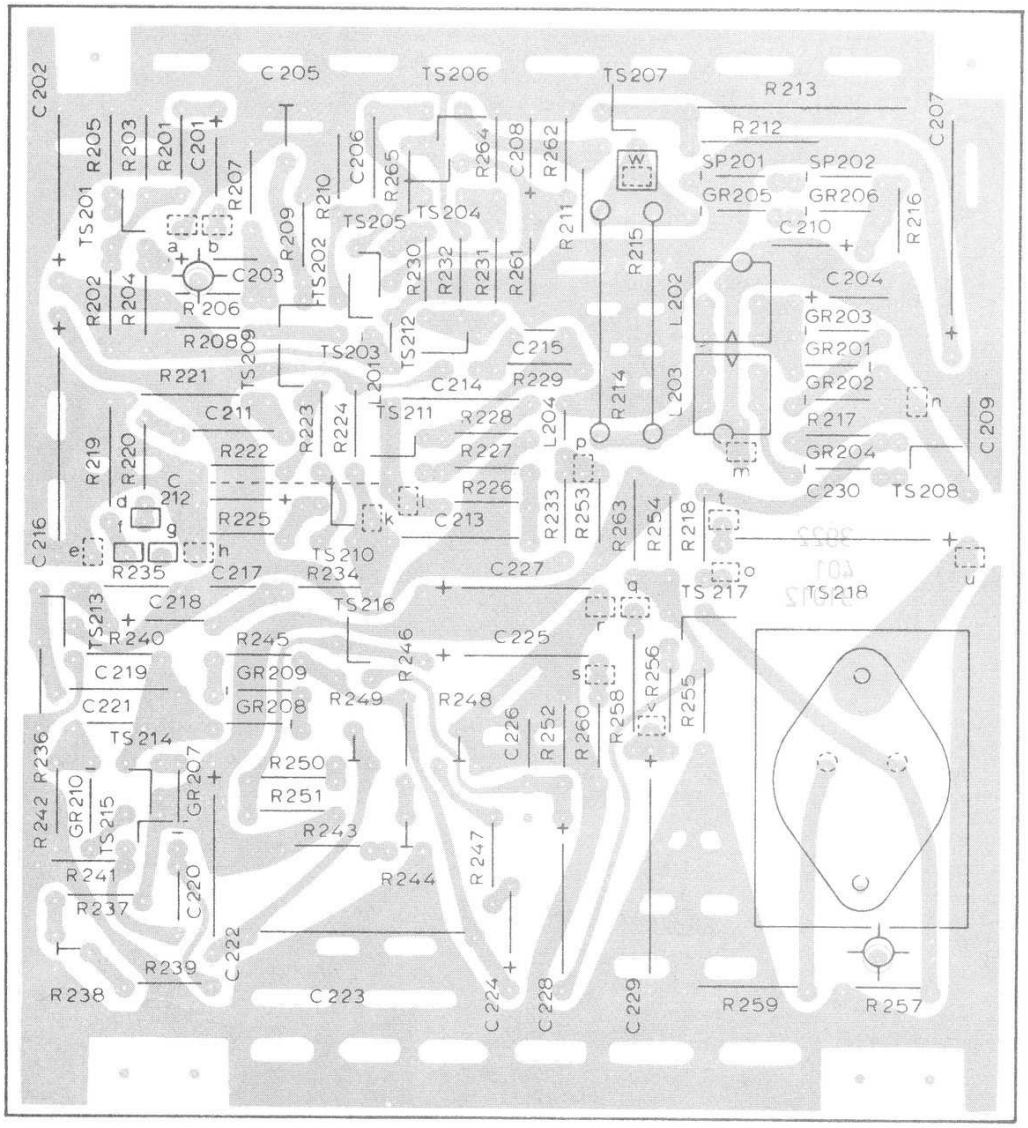
Item Pos.	Description	Code number
T2	Field output transformer	4822 140 20019
L1	Deflection plugs	4822 150 10079

U1


x
y
z
a
b
c
d
e
f
g
h
k
i
m
n
o
p
q
r
s
t
u
v
w
R111
R112
R114
R115
R116
R118
R119
R117
R121
R122
R126
R125
R123
R124
R120
R127
R128
C108
C107
C106
C101
C105
C111
C110
C113
C112
C109
C114
TS104
TS105
TS106
TS107
TS108
SP105
SP106
SP103
SP104
SP102
SP101
TS102
GR105
GR107
GR104
GR106
GR102
GR101
GR103
GR 108
VL101
R113
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R110
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C104
R107
R101
R102
R103
R104
R105
R106
TS101

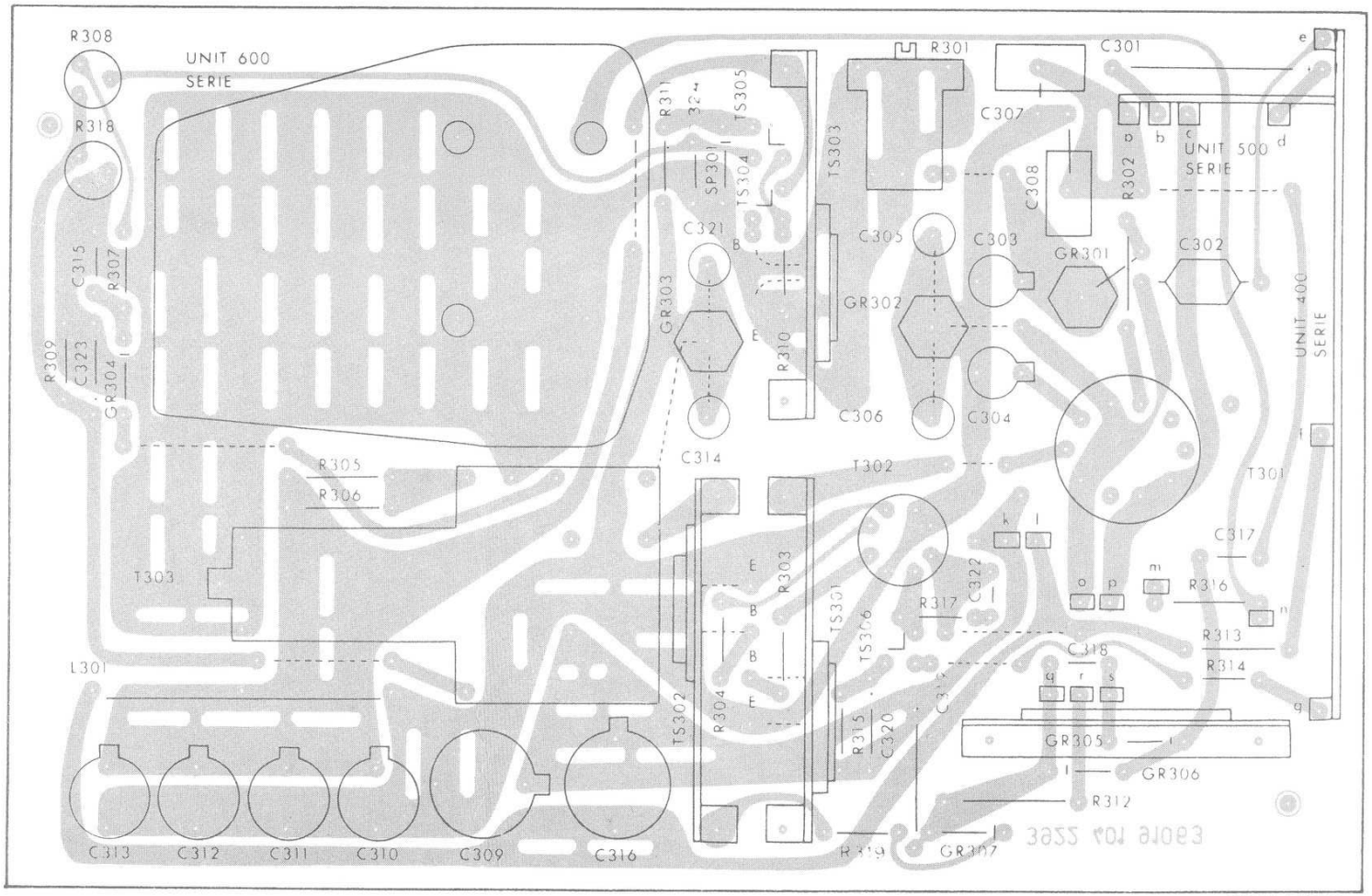
ETV 1971

U2


C 202
C 205
TS206
TS207
R 213
R 212
C207
R205
R203
R201
C201
TS201
R207
R210
C206
R265
R264
C208
R262
SP201
SP202
GR205
GR206
R216
C 210
R209
TS205
TS204
R211
R215
L 202
C 204
GR203
GR201
GR202
R217
GR204
C230
TS208
C 209
R202
R204
C 203
R 206
TS202
R230
R232
R231
R261
R208
TS209
TS203
TS212
C215
R221
L201
C214
R229
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L 203
C211
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R222
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R226
C 212
R225
C 213
R233
R253
R263
R254
R218
C 216
R235
C217
TS210
R234
C 227
TS 217
TS218
TS213
C218
TS216
R240
R245
R246
C 225
C 219
GR209
GR208
R249
R248
R256
R255
C221
TS214
C226
R252
R260
R258
R236
R250
R242
GR210
TS215
GR207
R251
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C 228
C 229
R259
R257

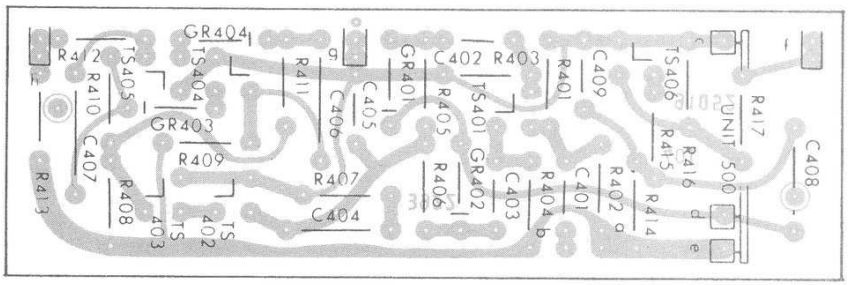
ETV 1972

U3


R308
UNIT 600
SERIE
R318
C315
R307
R309
C323
GR304
R311
SP301
TS305
TS304
TS303
R301
C301
C307
C308
UNIT 500
SERIE
R302
C321
C305
C303
GR301
C302
GR303
GR302
R310
C306
C304
C314
R305
R306
T302
T301
T303
C317
R303
C322
R316
R317
TS301
TS306
R313
C318
R314
L301
R304
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C316
GR307
UNIT 400
SERIE

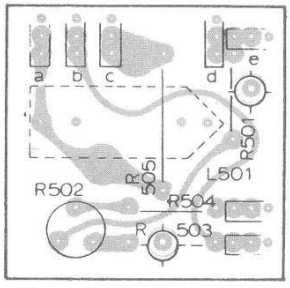
ETV 1973

U4



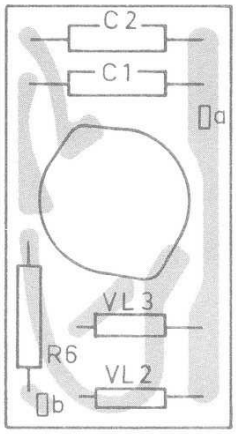
ETV 1974

U5

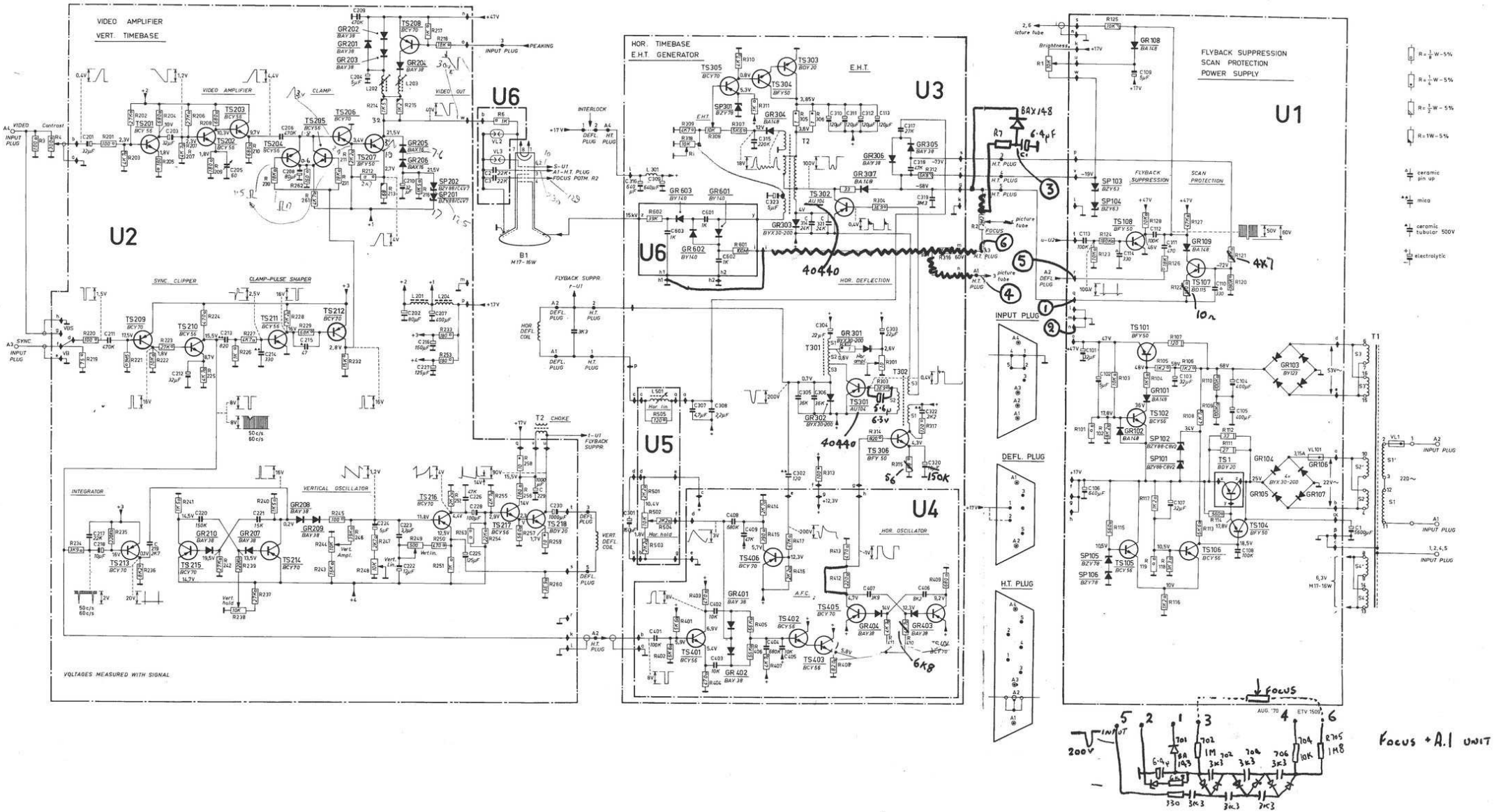


ETV 1975

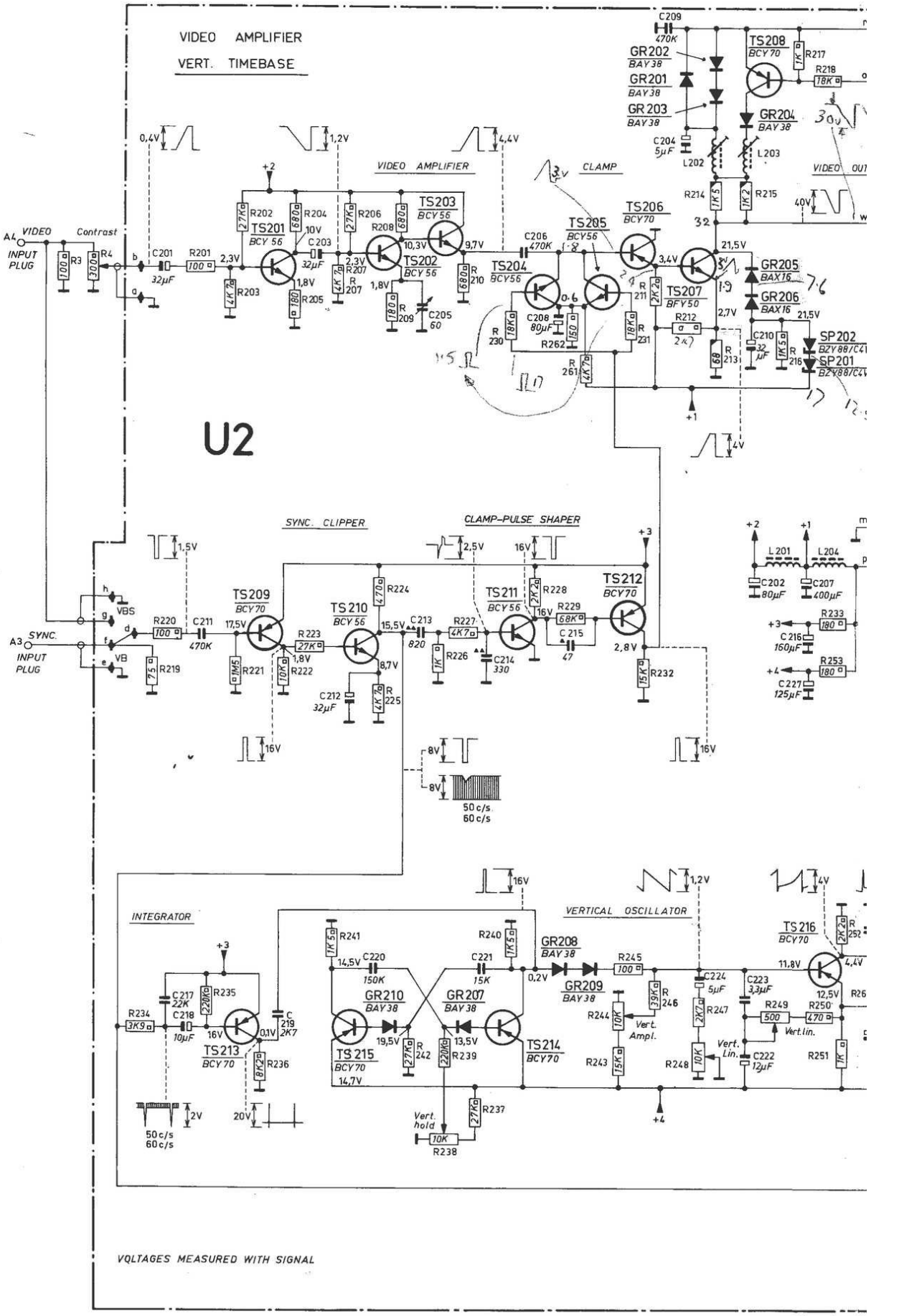
U6

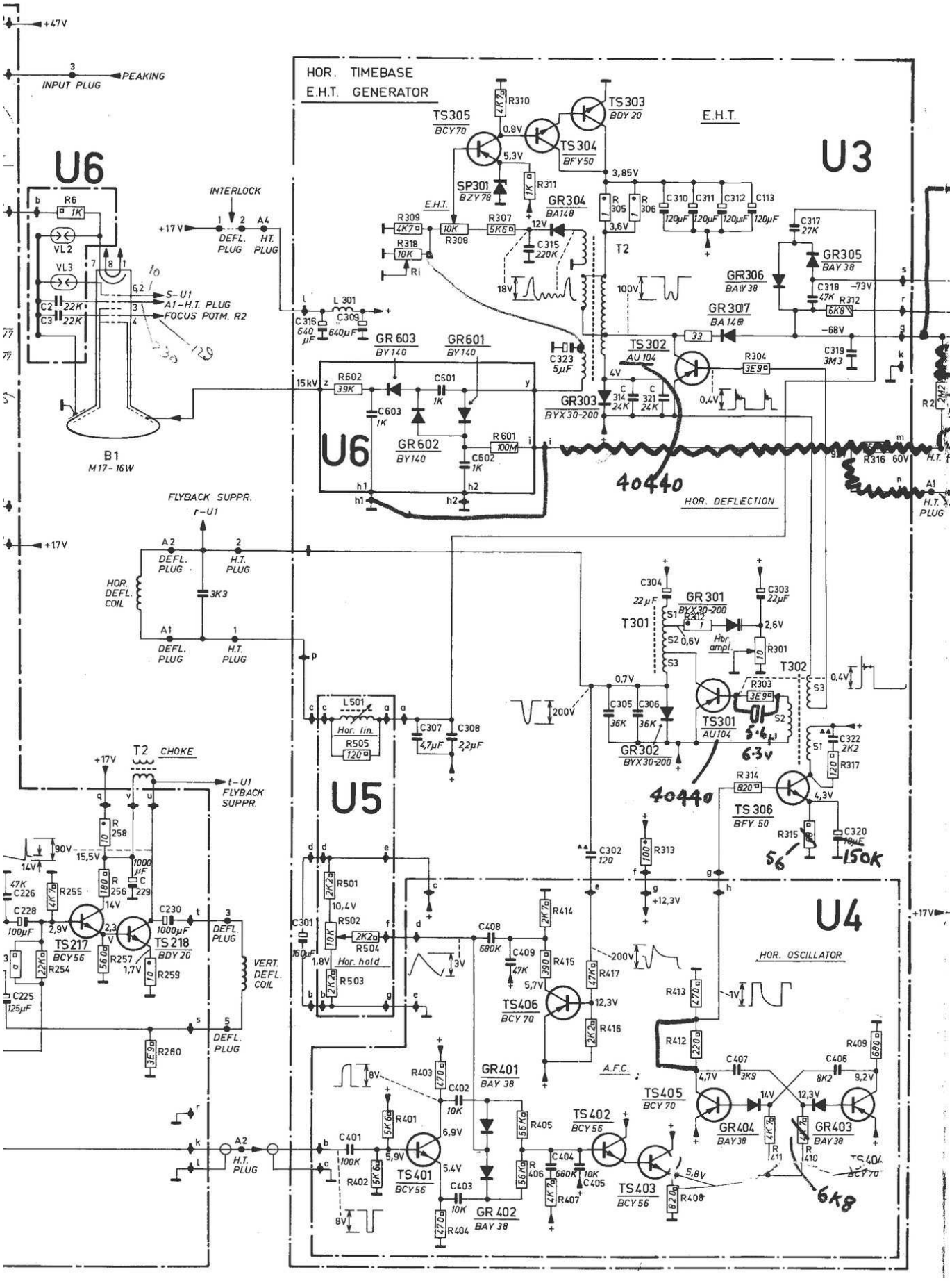


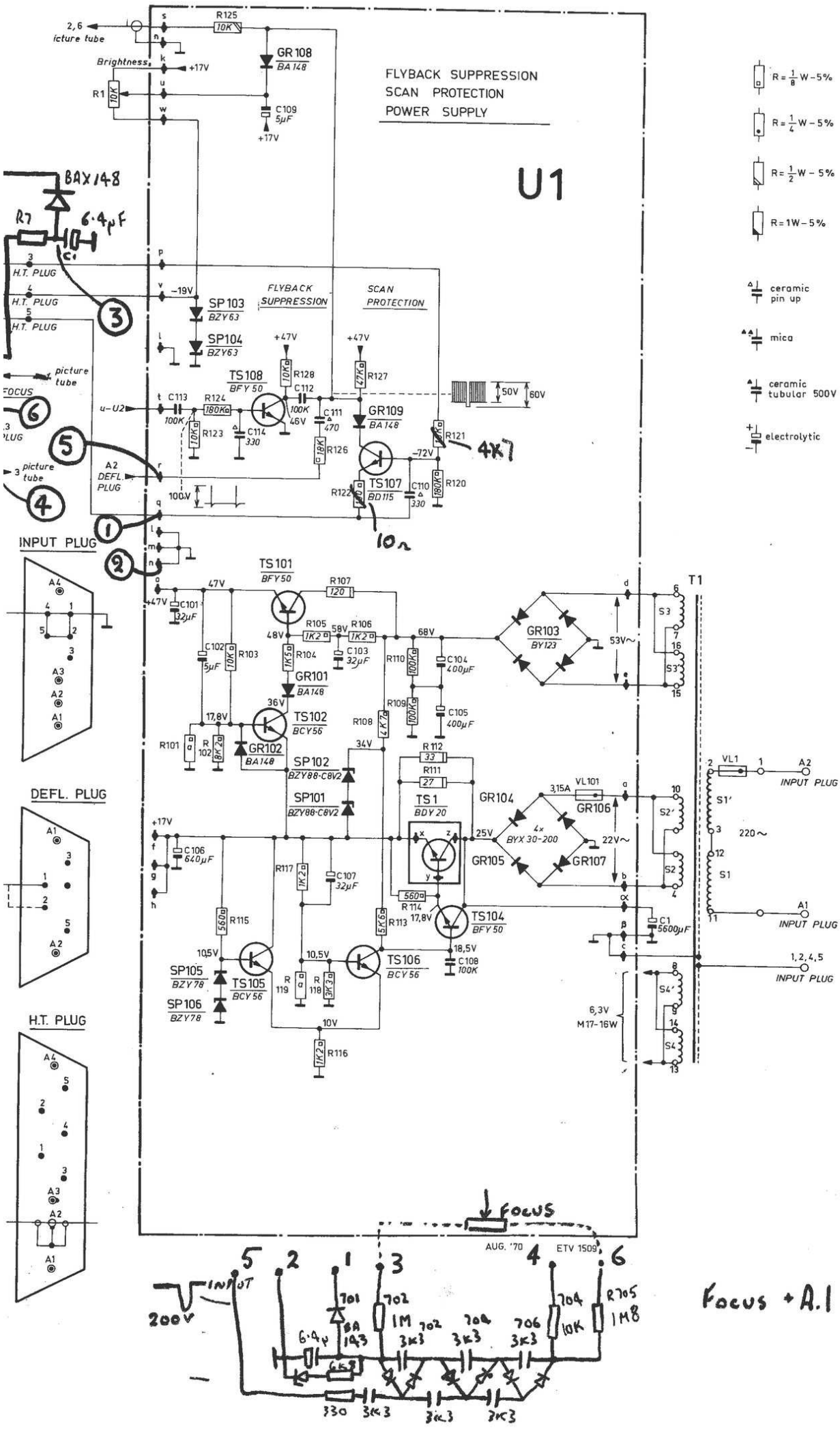
ETV 1943



FOCUS + A.1 UNIT


VIDEO AMPLIFIER
VERT. TIMEBASE
U2
VIDEO AMPLIFIER
CLAMP
SYNC. CLIPPER
CLAMP-PULSE SHAPER
INTEGRATOR
VERTICAL OSCILLATOR
VIDEO INPUT PLUG
SYNC. INPUT PLUG
TS201 BCY 56
TS202 BCY 56
TS203 BCY56
TS204 BCY56
TS205 BCY56
TS206 BCY70
TS207 BFY50
TS208 BCY 70
TS209 BCY70
TS210 BCY 56
TS211 BCY56
TS212 BCY70
TS213 BCY 70
TS214 BCY70
TS215 BCY70
TS216 BCY70
GR201 BAY38
GR202 BAY38
GR203 BAY38
GR204 BAY38
GR205 BAX16
GR206 BAX16
GR207 BAY38
GR208 BAY38
GR209 BAY38
GR210 BAY38
SP201 BZY88/C4V
SP202 BZY88/C4V
Vert. Ampl.
Vert. Lin.
Vert. hold
50 c/s 60 c/s
VOLTAGES MEASURED WITH SIGNAL


HOR. TIMEBASE
E.H.T. GENERATOR
U6
U3
U5
U4
INPUT PLUG
PEAKING
INTERLOCK
DEFL. PLUG
H.T. PLUG
S-U1
A1-H.T. PLUG
FOCUS POTM. R2
B1
M17-16W
TS305 BCY70
TS303 BDY20
TS304 BFY50
SP301 BZY78
GR304 BA148
E.H.T.
T2
GR305 BAY38
GR306 BAW38
GR307 BA148
TS302 AU104
GR303 BYX30-200
GR603 BY140
GR601 BY140
GR602 BY140
GR301 BYX30-200
T301
TS301 AU104
GR302 BYX30-200
T302
HOR. DEFLECTION
FLYBACK SUPPR. r-U1
HOR. DEFL. COIL
L501
Hor. lin.
R505
T2 CHOKE
t-U1 FLYBACK SUPPR.
TS217 BCY56
TS218 BDY20
VERT. DEFL. COIL
R501
R502
R504
Hor. hold
R503
TS406 BCY70
TS405 BCY70
TS402 BCY56
TS403 BCY56
TS401 BCY56
GR401 BAY38
GR402 BAY38
GR404 BAY38
GR403 BAY38
A.F.C.
HOR. OSCILLATOR
TS306 BFY50
40440
6K8
150K
5.6µ
6.3V


FLYBACK SUPPRESSION
SCAN PROTECTION
POWER SUPPLY
U1
FLYBACK SUPPRESSION
SCAN PROTECTION
INPUT PLUG
DEFL. PLUG
H.T. PLUG
T1
FOCUS
AUG. '70
ETV 1509
INPUT
200V
Focus + A.1 unit