

VIDEO TRANSCRIPTION AND TELEVISION UNIT

The unit is capable of reproducing both positive and negative pictures on the cathode ray tube. An electronic shutter converts 30 frame TV pictures to 24 frame information that can be photographed at standard 24 frame per second or 90 feet per minute speed.

Power requirements

| | | | |
|------------------------|------|---------|-------|
| Recording monitor----- | 15 A | 1phase | 115 V |
| Camera motor----- | 5 A | 3 Phase | 220 V |

VIDEO AMPLIFIER, SYNC SEPARATOR, BLANKING UNIT

The video amplifier circuits consist of three tubes, 1st video amplifier- 6AC7, 2nd video amplifier- 6AG7, 3rd video amplifier- 6V6GT, followed by a 6AL5 tube in a D.C. restorer circuit, feeding the grid of the cathode ray tube (CRT).

sync sep
The first three tubes are series and shunt peaked voltage amplifier stages fed by a video line supplying a maximum peak to peak signal of two volts. The line input signal can be varied by a potentiometer which serves as a contrast control.

The signal is then fed to a polarity switch (which sets the picture on the CRT positive or negative) and on to the grid and cathode of the 1st video amplifier tube.

The video signal is also fed from the line input jack directly to sync separator circuits as follows: 6AC7 amplifier-inverter, 6AC7 1st sync clipper, 6SN7 clipper and sync shaper which delivers a horizontal sync signal into the RCA 208T8 AFC transformer.

From the cathode of this 6SN7 the signal is also fed to a 6SN7 amplifier-clipper and phase inverter which feeds the bridge circuit of the 6AL5 D. C. insertion stage. The plate of the 6SN7 tube is also fed to the vertical sweep circuit input.

The blanking unit built into this chassis consists of nine additional tubes as follows: 6SN7 multi-vibrator, 6SH7 amplifier inverter, 6SN7 2nd multi-vibrator, 6SN7 cathode follower and amplifier inverter, 6SN7 3rd multi-vibrator, 6SN7 4th multi-vibrator, 7AK7 mixer, 2 6AG7 tubes (which mix the vertical, horizontal and shutter blanking signals) and may be labeled blanking output tubes.

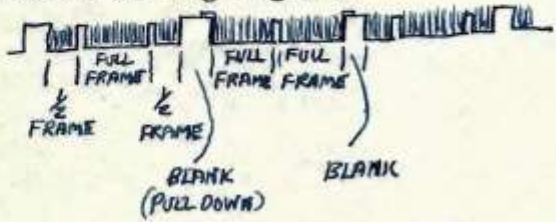
To produce positive pictures for theatre projection, the CRT must show a negative picture to the camera. On doing so, the standard blanking as transmitted with the video signal, will cause the vertical and horizontal retracelines to appear in the picture. It is therefore necessary to generate a blanking signal of proper amplitude and duration to blank out these retracelines.

Each blanking signal is generated by two multi-vibrators, the first establishing the phasing and the second the duration of blanking. The vertical sweep pulse (from the sweep chassis) triggers the cathode of the 1st multivibrator. The duration of the on period is controlled by the 500K pot marked TOP BLANKING. This control establishes the phasing of both top and bottom blanking and should be set first. The output of this multi-vibrator is differentiated and clipped, amplified and inverted by the following 6SH7 tube, so that the remaining pulse represents the end of the on time of the multi-vibrator. The output of this tube triggers the next multi-vibrator which generates the vertical blanking waveform. The duration of this multi-vibrator "on" period and the bottom blanking position is controlled by the one meg pot marked BOTTOM BLANKING. *W+V+*

The output of the 2nd multivibrator is fed thru a $\frac{1}{4}$ mike condenser to pin #6, one of the control grids in the 7AK7 tube.

The generation of horizontal blanking is accomplished in similar fashion. The horizontal sync pulse from the sweep chassis is fed into a cathode follower and thence to the 3rd multi-vibrator. The 100K pot in this stage is marked LEFT BLANKING BUT influences the right hand edge and should be adjusted first.

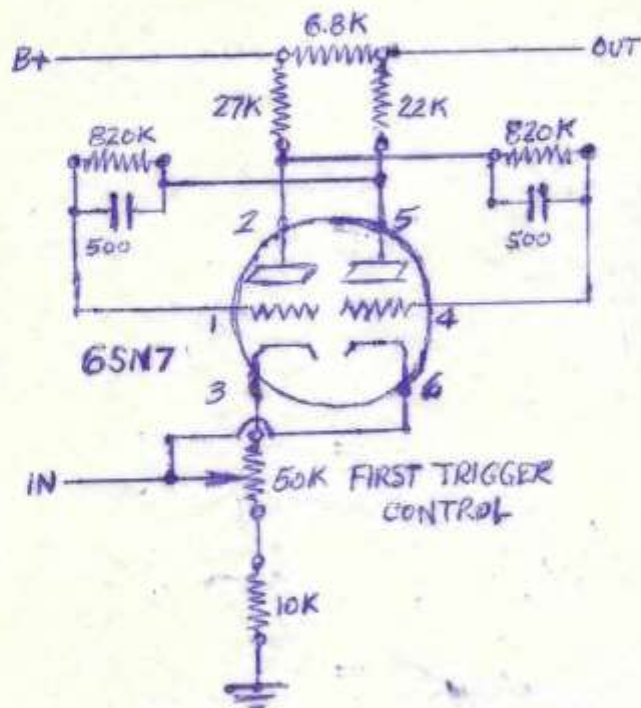
Output of the 3rd multi-vibrator is fed thru the $\frac{1}{2}$ 6SN7 amplifier and inverter stage to the 4th multi-vibrator stage with its 300K pot marked RIGHT BLANKING and the horizontal blanking signal is then fed to pin #4 the remaining control grid in the 7AK7 tube. From the plate of the 7AK7 mixer the combined horizontal and vertical blanking signals are fed to the grid of the 6AG7. The remaining 6AG7 receives the shutter blanking signal and the plates of these tubes provide the completed blanking signal.



ECCLES JORDAN CIRCUIT

The Eccles-Jordan circuit is a frequency halving generator commonly known as a "flip flop" circuit.

This circuit is used in the first and second triggers on the 24 cycle generator chassis. A pulse may be fed into the grid, plate or cathode of the tube and this pulse causes the non-conducting section to conduct which renders the other triode non-conducting by biasing the grid to cut off point. Since this action occurs for each pulse fed into the circuit, the plate current for either triode section ~~will flow for either section~~ will flow for half the time. The voltage across the right hand plate resistors will then be a square wave at half the frequency of the input pulses.



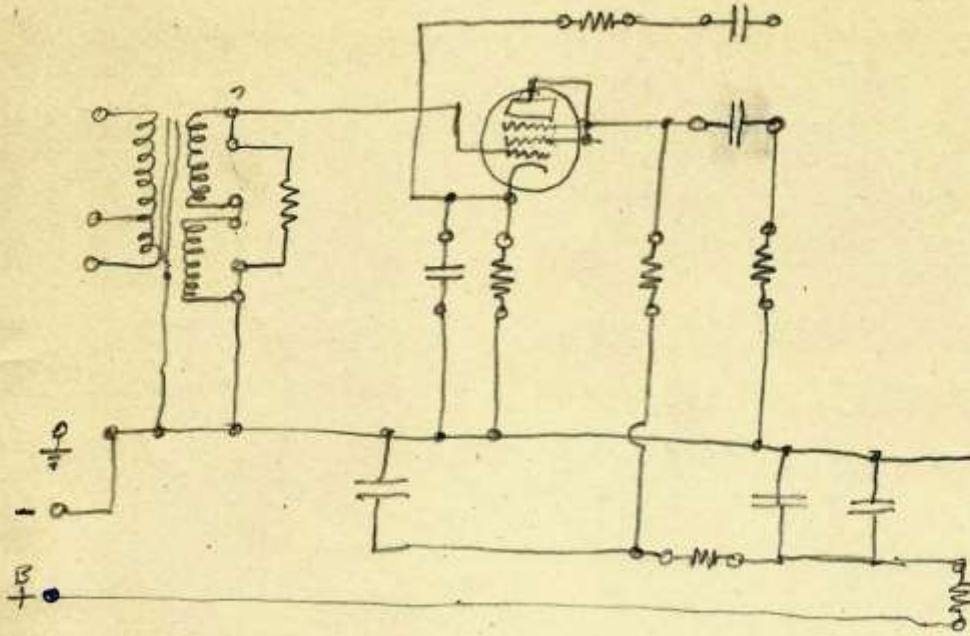
In the above circuit, when a pulse hits the trigger the output voltage drops. The plate is connected through the isolation amplifier ($\frac{1}{2}$ 6SN7) to the 7AK7 gating tube screen and the input pulse serves to close the gate.

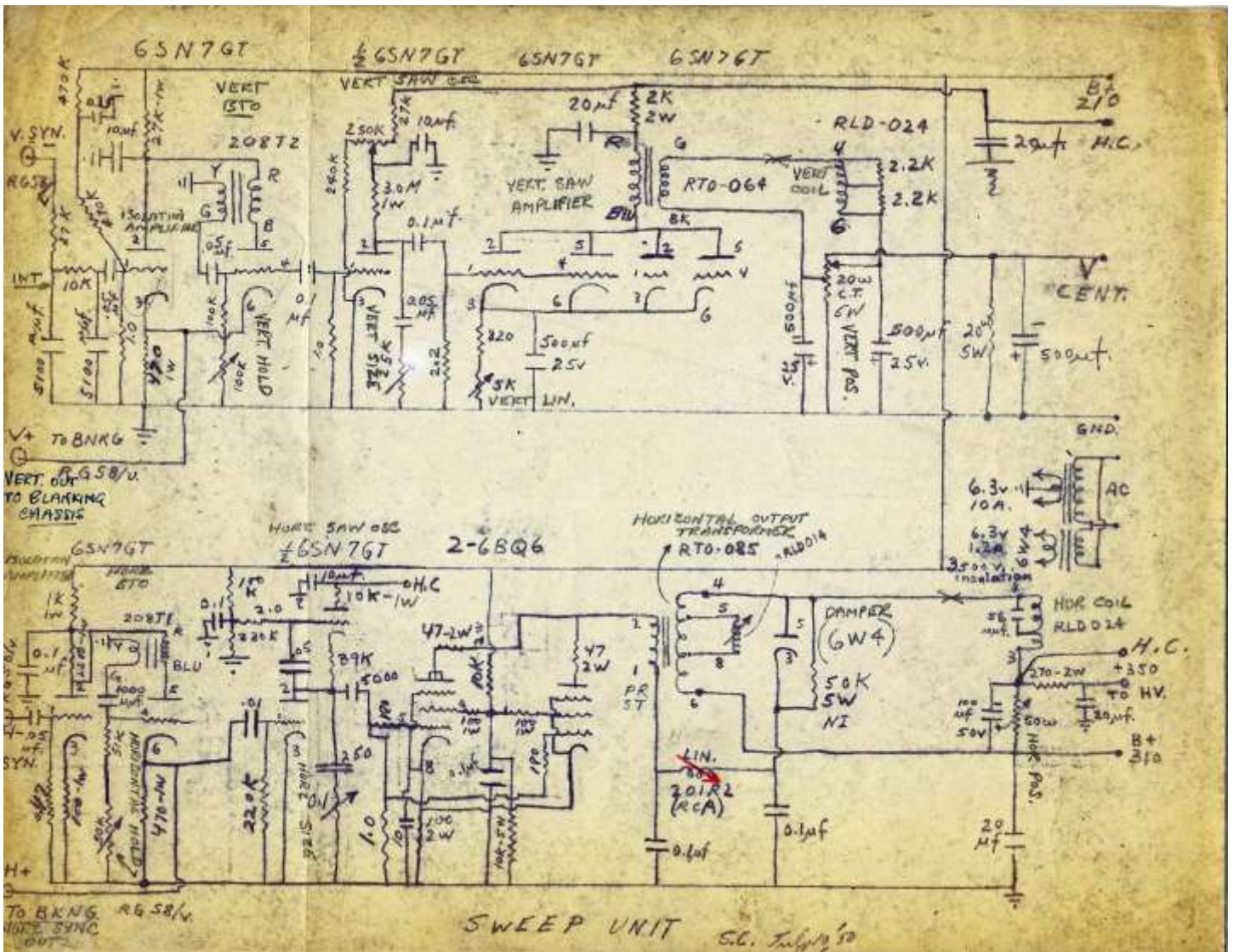
24 Cycle Generator and Shutter Chassis

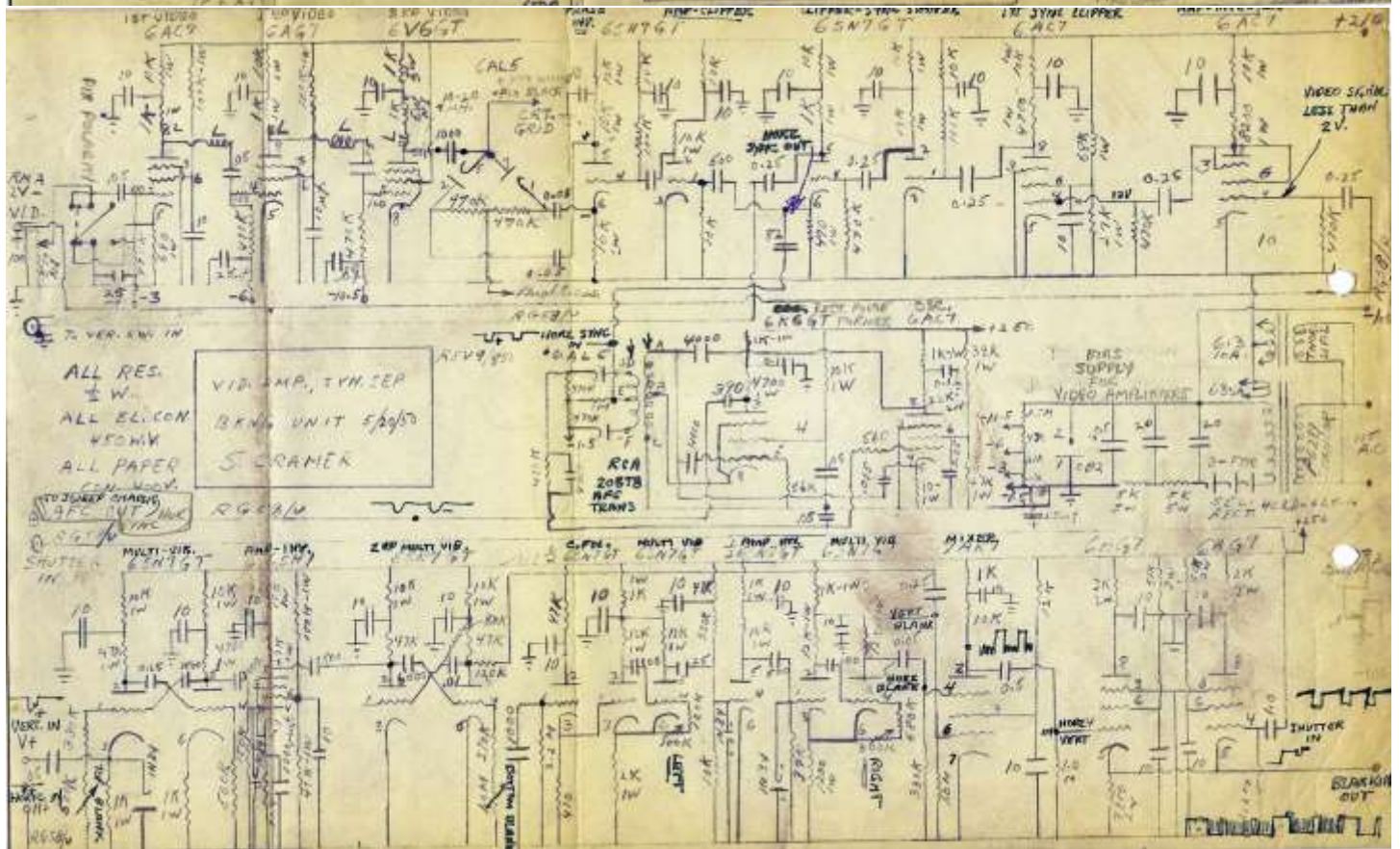
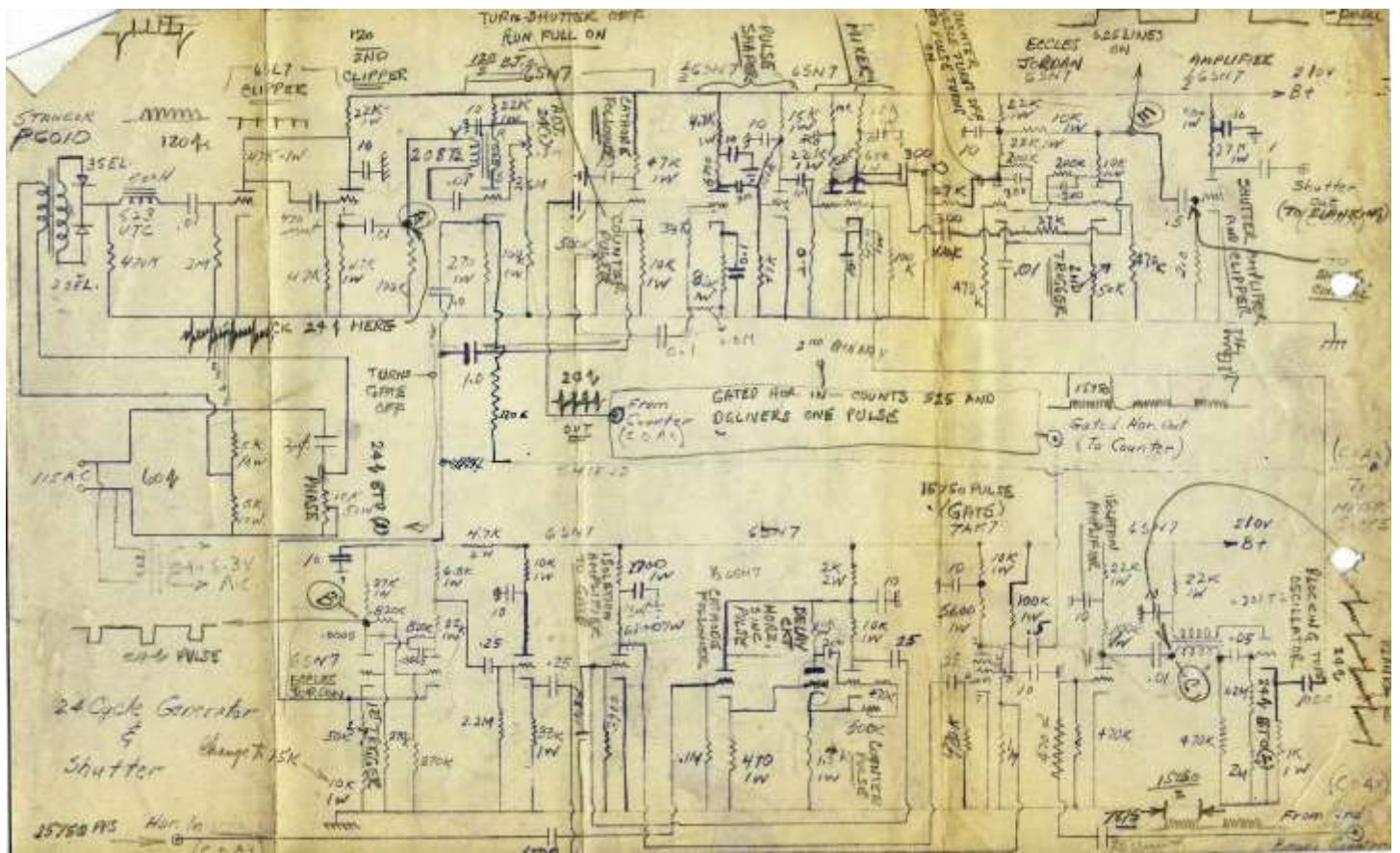
The Mitchell Camera of this system contains no shutter. Mechanical shutters will not meet the requirements necessary to photograph the television 30 frame per second rate with the camera taking pictures at 24 frames per second. The shutter action must be accomplished electronically to convert the TV rate to standard motion picture speed.

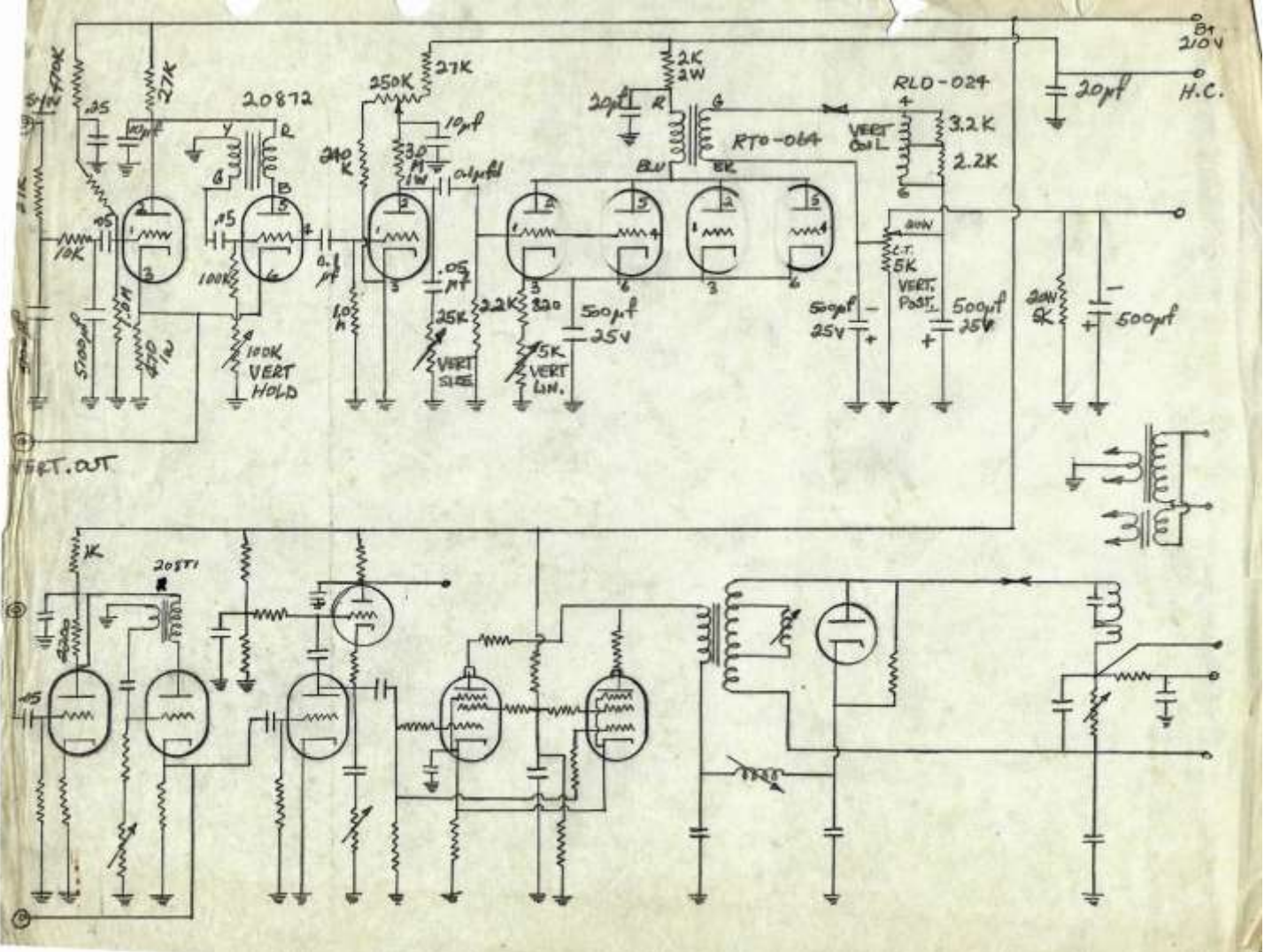
The TV rate of 30 frames per second was used because with interlaced field scanning the flicker frequency was increased to 60 light pulses per second and the picture brightness could be increased to the point where it would be possible to view television without discomfort in a lighted room. This frequency, matching the standard A. C. line frequency in the United States, has advantages in the simplification of design of TV receivers and transmitters. 60 cycle hum pickup results in bars appearing on the picture. Any other ~~field~~ frequency than line frequency would result in hum bar traveling through the picture.

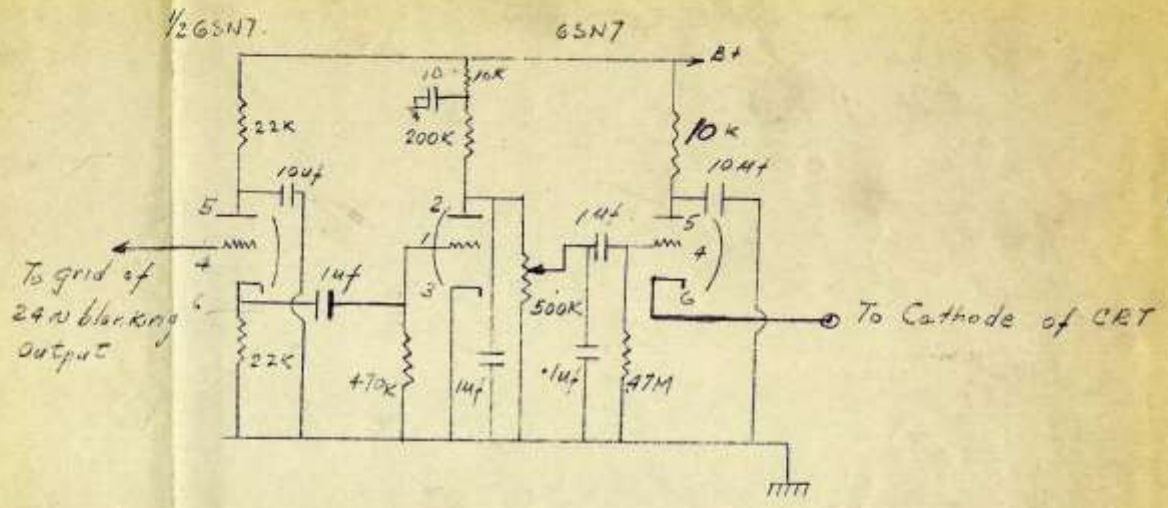
ALTEC LANSING A-420











Shading Control

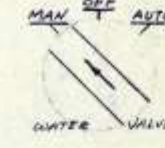
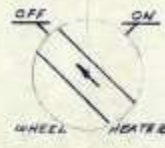
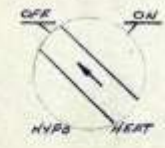
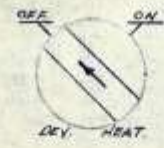
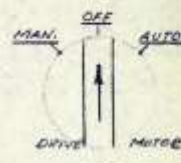
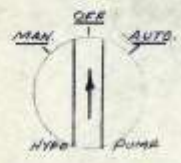
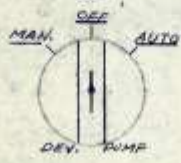
DEV. PILOT

HYPO. PILOT

BLOWER PILOT

PROCESS. DRIVE READY

AUTO. RUN.



CAMERA READY

DEV. HEAT. PILOT

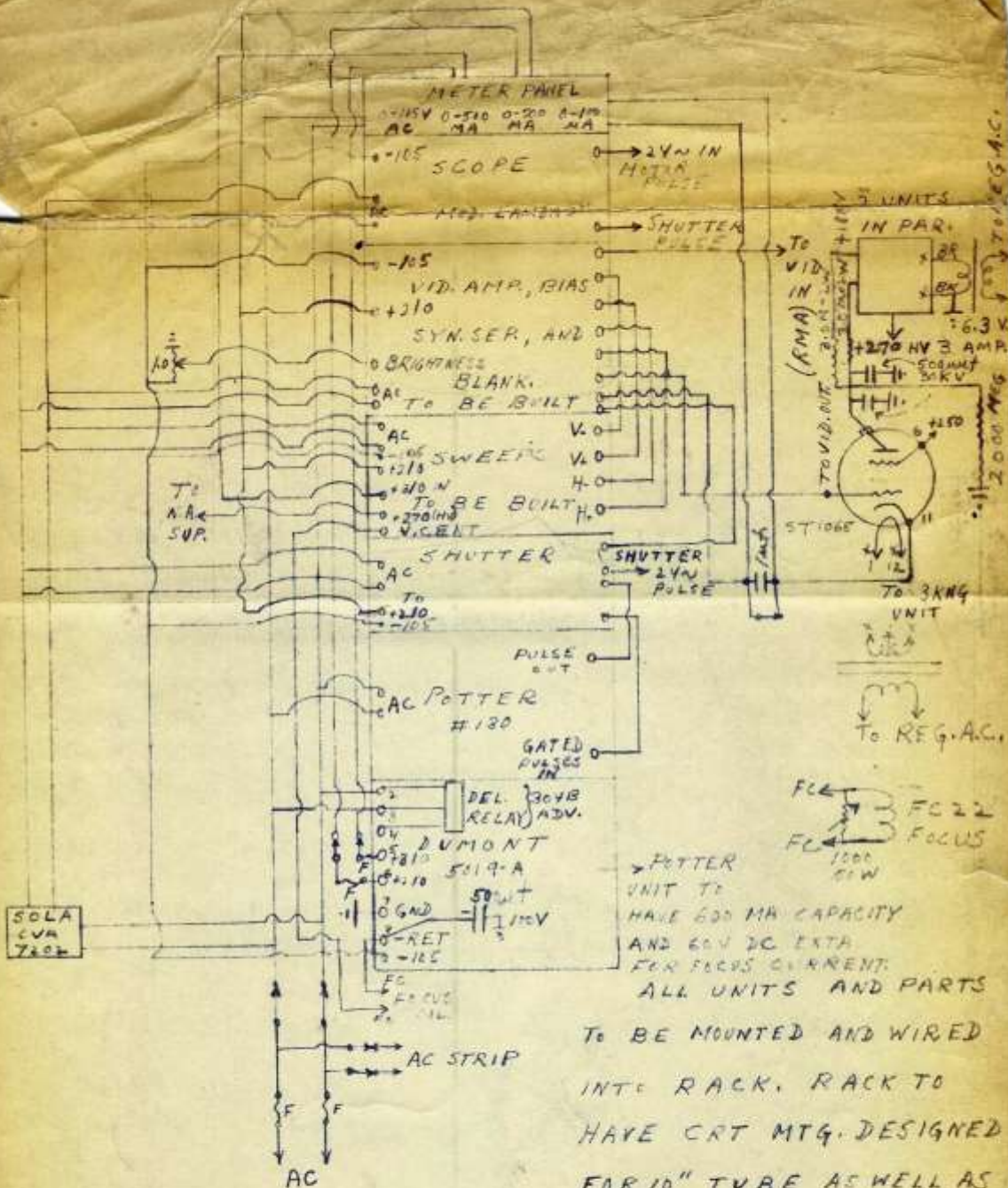
HYPO. HEAT. PILOT

WHEEL HEAT PILOT

WATER PILOT

PROJ. READY

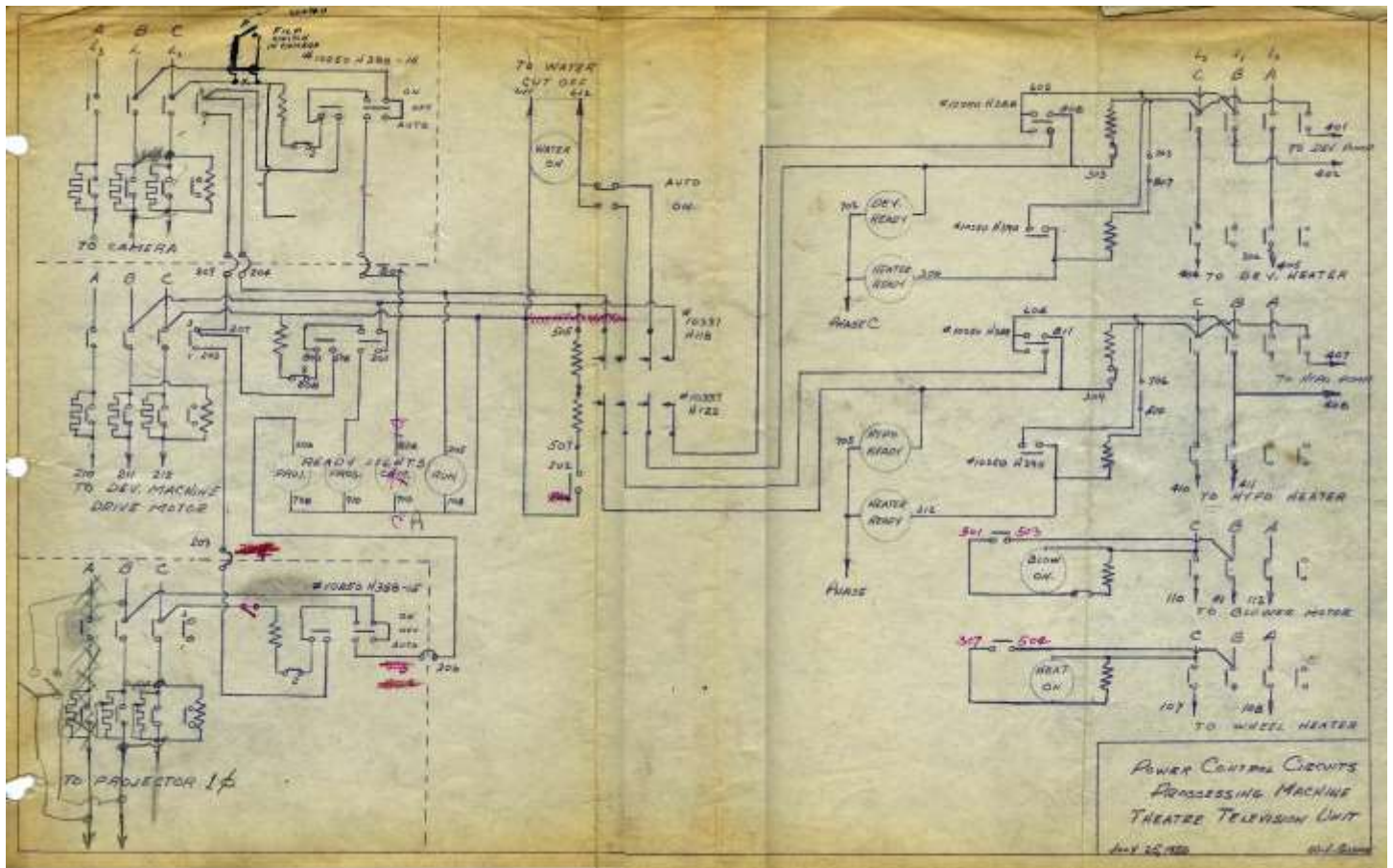
PROCESSING MACH. CONTROL
THEATRE TELEVISION UNIT



TO BE MOUNTED AND WIRED
 INTO RACK. RACK TO
 HAVE CRT MTG. DESIGNED
 FOR 10" TUBE AS WELL AS
 5WPH AND FITTED WITH
 X-RAY GLASS.

S. CRAMER
 5/23/50

REV. SEPT. 1950



POWER CONTROL CIRCUITS
 PROCESSING MACHINE
 THEATRE TELEVISION UNIT
 July 15, 1950