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(EXPI)

LIGHT-PULSER MEASUREMENTS ON THE XP 1210 HIGH-SPEED PHOTOMULTIPLIER TUBE*

by

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High-speed light-pulser measurements were conducted on the Amperex XP 1210 10-stage photomultiplier tube operated with the divider chain of Fig. 1. at a high voltage of -4.5 kV (specified gain of 2×10^7). The test setup is shown in Fig. 2. The gallium phosphide diode light source, pulsed by two 0.8-nsec-wide pulses spaced at 4 nsec, 3 nsec, 2.5 nsec, and 2 nsec, illuminated the center of the 42 mm diameter photocathode.**

The anode signal of the photomultiplier tube is shown in Fig. 3. The pulse height is 2.4 V (48 mA), the 10% to 90% risetime is 0.8 nsec, and the pulse width is 1.4 nsec at half height, 2.2 nsec at 20% height. The two pulses are separated at a pulse-spacing of 3 nsec, and they can be distinguished at a pulse-spacing of 2 nsec. No attempt was made to identify the contribution to these numbers by the light source. A second pulse, occuring 10 nsec after the main pulse, was measured to have a height of $< 5\%$ of the main pulse.

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FIGURE CAPTIONS

1. Photomultiplier tube divider chain.
2. Test setup. All interconnections are made by 50-Ω coaxial cables. Pulse doubler loop is a 50-Ω coaxial cable with 4 nsec, 3 nsec, 2.5 nsec, or 2 nsec length.
3. Anode signal of the XP 1210 photomultiplier tube with its cathode illuminated by two light pulses spaced at 4 nsec (a), 3 nsec (b), 2.5 nsec (c), and 2 nsec (d). Oscilloscope risetime is 0.26 nsec, vertical sensitivity is 9 V/cm, sweep speed is 2 nsec/cm.

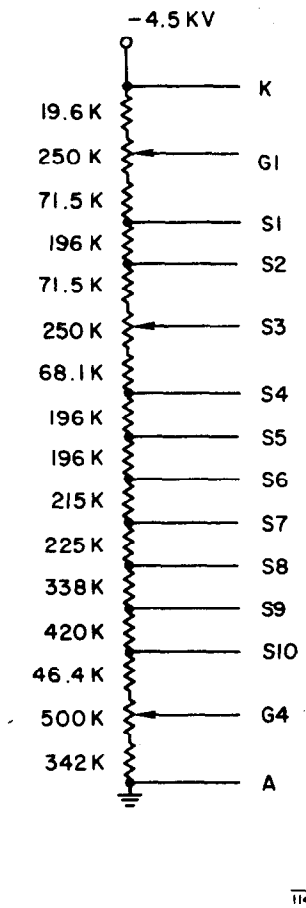
-4.5 KV
K
19.6 K
250 K
G1
71.5 K
S1
196 K
S2
71.5 K
250 K
S3
68.1 K
S4
196 K
S5
196 K
S6
215 K
S7
225 K
S8
338 K
S9
420 K
S10
46.4 K
500 K
G4
342 K
A
1149A1

Fig. 1

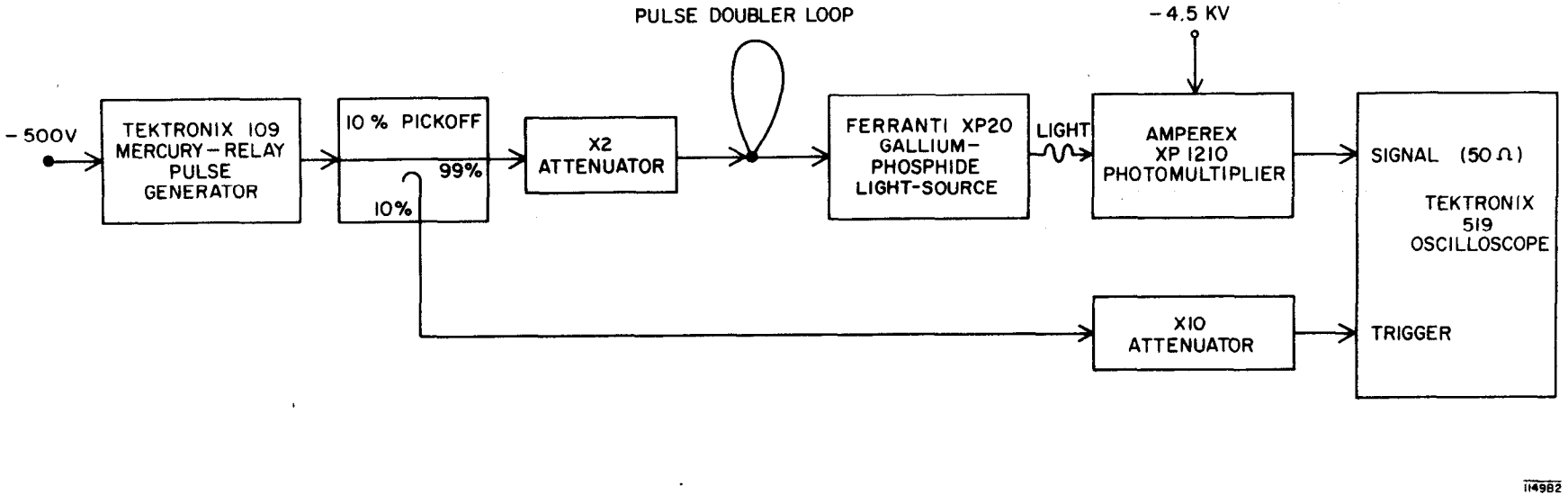
PULSE DOUBLER LOOP
-4.5 KV
-500V
TEKTRONIX 109
MERCURY-RELAY
PULSE
GENERATOR
10 % PICKOFF
99%
10%
X2
ATTENUATOR
FERRANTI XP20
GALLIUM-
PHOSPHIDE
LIGHT-SOURCE
LIGHT
AMPEREX
XP 1210
PHOTOMULTIPLIER
SIGNAL (50 Ω)
TEKTRONIX
519
OSCILLOSCOPE
X10
ATTENUATOR
TRIGGER
114982

Fig. 2

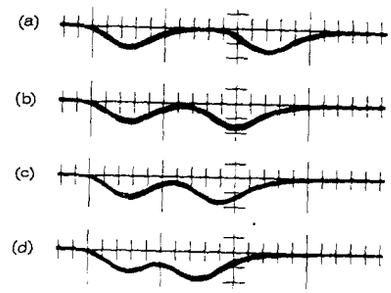

Fig. 3