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Distribution:

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Central Technical File, 3428-1

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## Introduction

The need for a backup oscilloscope for the U1200 was outlined in a Confidential memo from R. D. Christopher, 2125, and W. A. Sherman, 2122, to P. W. Callies, 2444, subject, Proposed QEST/U1200 Modification. (U). Specifically: "The backup oscilloscope provides neutron generator output (at x-unit fire time) and timing data should one of the neutron generators premature, since the U1200 timing chassis only provides timing data on the first neutron pulse which crosses a predetermined neutron rate line."

In addition, the above memo requested that all QEST's reset the U1200 at arm time so that the first possible neutron output will be detected.

For these reasons, this proposal has been prepared and distributed.

## Engineering Details

The two features will be discussed separately:

First, the change in reset times is considered on an individual basis for each warhead QEST on which the U1200 is used in Table I.

Since the bomb QEST's do not control arming and firing, it is proposed that all bomb QEST's reset the U1200 and open the camera shutters at pullout time or very near the beginning of the test. It may be desirable to reset the U1200 again at fire time.

Next, the backup oscilloscope system is shown in block diagram form in Figure 1. Unlike the U1200 oscilloscope, this backup unit will be set on single sweep and triggered only from an x-unit output. A neutron generator premature will be ignored by the backup oscilloscope, but indicated on the U1200 system.

## Cost

The cost for this modification is broken down into two parts. First for the change in reset times which is shown in Table 1.

For the backup oscilloscope itself, the cost is based on the oscilloscopes being available as noted in the above referenced memo and amounts to \$750 for one system. If two systems are needed, as will be the case if two U1200's are to be used at once, each additional system will cost \$250. A saving of \$50 per system could be realized if D.C. shutters are not used.

For the bomb QEST's, it will cost \$200 each for the B28-0-1, B28-3, B34, B41, B43, B53, and B57, or a total of \$1400 for either one or two resets. No change is necessary for the B61.

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Cost Breakdown:

<u>Warhead QEST's</u>		<u>Bomb QEST's</u>	
One Reset	\$2600	Two Resets	\$4100
Oscilloscope System	<u>750</u>		<u>750</u>
Total	\$3350		\$2150
Add'l. Oscilloscope Systems	\$ 250	\$ 250	\$ 250

All systems can be completed within six weeks after receipt of NP.

It should be noted that a proposal is in process to put the output of the U1200 into the Digital Data System. If this is done, the backup oscilloscope may no longer be necessary. However, the changes in reset time will still be required.

The times between arm and fire signals may be several minutes in some systems. If the camera shutters are left open this long, some problems may be encountered with light leaks. Also, the changes of premature neutron output, transients, etc., are greater. Therefore, it is advisable in these systems to reset the U1200 again just before fire time. This alternate is included in this proposal.

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QEST	Presently, Reset	Time of Shutter Opening	Req'd Rework to Open Shutters and Reset at Charge Time	Est Cost	Est Time to Comp	Req'd Rework to Reset at Charge and Fire	Est Cost	Est Time to Comp
W30	Just Before Fire	Same	Rewire Programmer	\$ 200	2 Weeks	Rewire Programmer and add Relay	\$ 300	3 Weeks
W31	Just Before Fire	Same	Rebuild U1672	1,000	6 Weeks	Rebuild U1672	1,000	6 Weeks
W34	Just Before Charge	Same	None					
W40	Just Before Fire	Same	Rewire Programmer	200	2 Weeks	Rewire Programmer	200	2 Weeks
W44	Just Before Fire	Same	Change Programmer	200	2 Weeks	Change Programmer	200	2 Weeks
W45	Just After Charge & Just Before Fire	Just Before Fire	Change Programmer	200	2 Weeks	Change Programmer	200	2 Weeks
W47	Just Before Fire	Same	Change Programmer	200	2 Weeks	Change Programmer	200	2 Weeks
W49	At Charge Time	.5 Sec after Charge	Change Wire	200	2 Weeks	Diode Insulation	200	2 Weeks
W50	In process of redesign. Will reset before charge time.							
W52	In process of redesign. Will reset before charge time.							
W53	At Charge and Just Before Fire	Just Before Fire	Change Wire	200	2 Weeks	Diode Isolation	200	2 Weeks
W55	Just Before Charge	Same	None	---	---	Add Jumper	200	2 Weeks
W56	Just Before Fire	Same	Change Programmer	200	2 Weeks	Change Programmer	200	2 Weeks
W58	Just Before Charge	Same	None	---	---	Change Programmer Cables, Junction Box	1,000	4 Weeks
W59	Before Charge	Same	None	---	---	Add Jumper	200	2 Weeks
TOTAL				\$2,600			\$4,100	

Table 1

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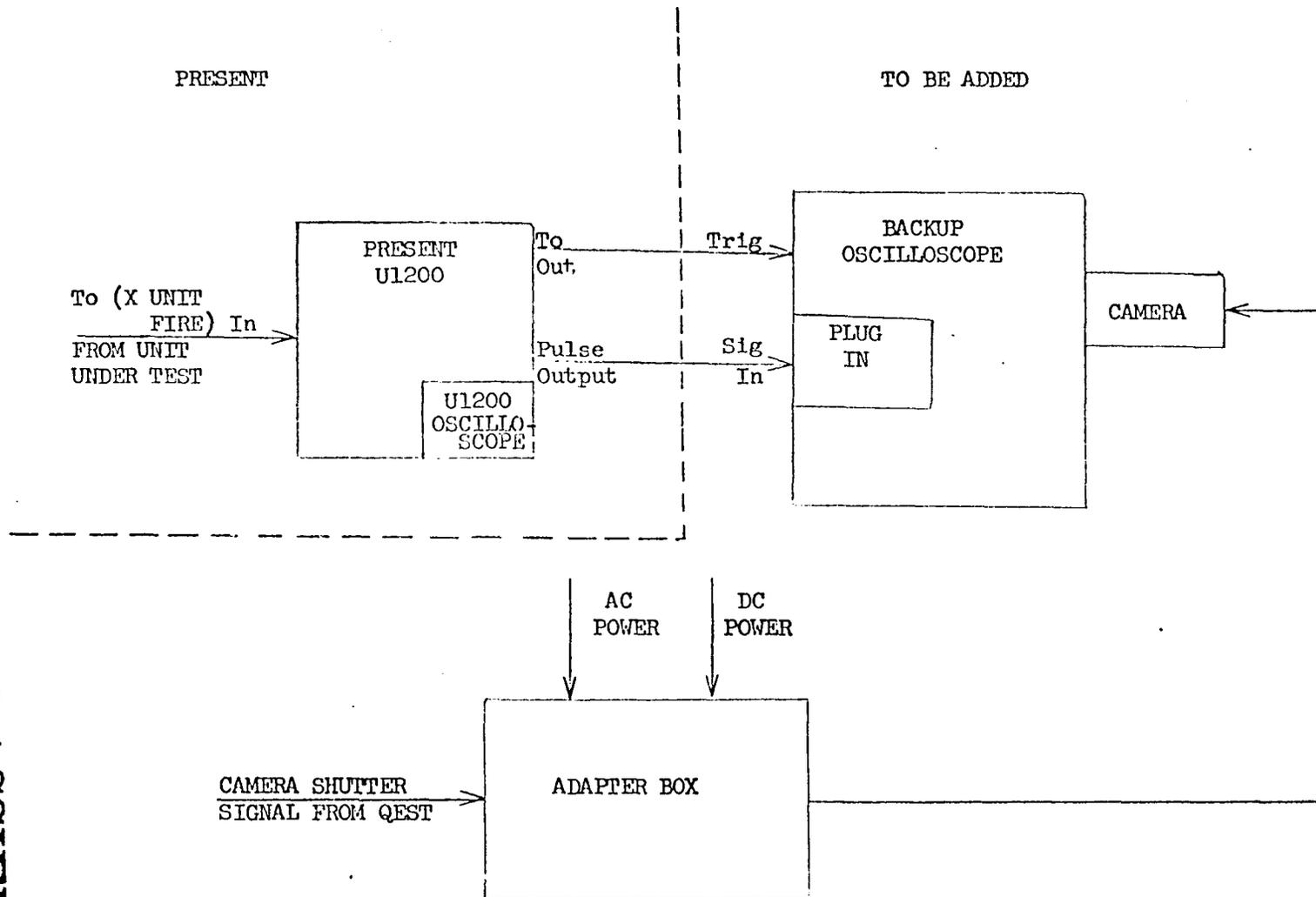


FIGURE I

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