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Memorandum M-1568

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Digital Computer Laboratory
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SUBJECT: VISIT TO CONTROL INSTRUMENT COMPANY AND SUBSEQUENT TELEPHONE CONVERSATIONS

To: Test Equipment Committee
From: David R. Brown and Louis Sutro
Date: August 4, 1952

Abstract: The conversations covered three subjects: 1) the schedule of delivery of all the units on order, 2) inspection of completed Burroughs units, 3) testing of these units.

Background

An order for 487 Burroughs units dated April 15, 1952, received Air Force approval and was placed with Control Instrument Company in mid-May. The order carried the delivery schedule agreed to by the company, namely one-third by July 14 and the remainder by September 14. On July 7, Mr. Edward Hoffmann of Control Instrument Company informed us that due to the difficulty of transferring production from Burroughs in Philadelphia to Control Instrument Company in Brooklyn, the first 150 units would be two weeks late.

Because of our concern over inspection as explained below, we had planned to visit the factory of the Control Instrument Co. during the first week in July. Mr. Hoffmann urged us to put off our visit to July 24 when he assured us there would be 75 units going through test.

Delivery

We arrived at the Control Instrument Co. about 10 a.m. July 24. As we toured the factory, we stopped in the area devoted to testing and there saw the first four Burroughs units of the present contract. They had come in from a subcontractor that day.

The factory we found to occupy four floors of the Bush Terminal Building, each floor measuring roughly 200 sq. ft. by 1,000 sq. ft. The factory employs 1,200 now and expects to employ 2,400 in another two years. We visited a drafting department perhaps twice the size of ours, a large production machine shop, a wiring shop and many assembly areas. As we visited the machine shop, Mr. Hoffmann explained that parts for our units would be machined there. As we visited the wiring area, Mr. Hoffmann explained that our assemblies would be wired there.

Mr. Hoffmann said they would start shipping units at the rate of 4 a day beginning July 29 and would gradually increase the quantity until they

were shipping 16 a day.

Upon our return to Cambridge, we consulted together. The fact that nothing was being done on our order in the Control Instrument Company's factory alarmed us and made us suspect that the schedule of four to 16 units a day was, like the two previous delivery schedules, based on Mr. Hoffmann's optimism.

Accordingly on Monday, July 28, we telephoned Mr. Hoffmann, told him of the serious loss of engineering time that we suffered each day while waiting for the Burroughs equipment, and insisted that he give us a production schedule. On Wednesday, July 30, Mr. Hoffmann called back, reported that he had consulted with an executive vice president and offered the following report:

<u>Unit</u>	<u>Quantity</u>	<u>Arrived at Factory</u>	<u>Result of Inspection</u>
1201-AW Gate Tube Panel	2	July 24	Filament wiring too small. Returned to subcontractor.
1301-AW Gate and Delay Pulse Generator	2	July 24	"
1001-BW MV Pulse Gen.	10	July 31	Held by subcontractor to replace filament wiring.
1201-AW Gate Tube Panels	10	Aug. 1	
1003-AW Gas Tube Pulse Generator	9	Aug. 4	

The first two items in the above list are the four units which came in while we were at the factory. They were to be returned to Control Instrument for re-inspection July 30. The Control Instrument Co.'s factory will get into production so that after August 8 output will be 20 a day. Later in the month it will be 40 a day. The factory production schedule will be reported to us on August 4. Mr. Jeffries, engineer in charge of test and inspection, has cancelled his vacation due to start August 1--others are working 12 hours a day.

A possible stumbling block is the lack of parts. They have reported the lack of a precision resistor for the flip-flop and an isolation transformer for the Rack Power Control. They promise to report the complete list of lacking parts August 1.

Inspection

Inspection is nearly as great a problem as delivery. Experience has indicated to Chan Watt and his foreman in charge of inspection, Ernie Nickerson, that every unit purchased must be examined as follows: Every wire must be traced and checked against the circuit schematic. Every component must be checked against the circuit schematic. Every solder joint must be examined from several angles. Inspection of a Burroughs unit takes from two

to three hours, one inspector usually getting through three units a day.

Chan Watt has agreed that this procedure will be applied to only one out of ten units at first. If that unit should fail to pass inspection in any way, he will insist that all units be given the usual thorough inspection. At present, Nickerson is short one man. With the men that he has he is completely occupied with inspection and testing of plug-in units and the oscilloscopes and other equipment ordered by the Test Equipment Committee. There will be delay in inspecting one out of ten units. Inspection of all units will mean a delay of weeks.

With this situation in mind, we described our inspection procedure to Mr. Jeffries. He replied by describing their inspection procedure. They check continuity with an ohm meter but do not trace every wire. They "yank" every solder joint by grabbing one of the leads coming into the joint and pulling. Inspection usually takes about 20 minutes, in rare cases an hour.

When told of their procedure, Ernie Nickerson said he believed they were failing to thoroughly examine solder joints. He showed us joints that could pass a yank test but were rejected by his men--some because solder had not covered all the wires in the joint and others because the color of the joint had indicated that it was bound largely by rosin rather than by solder. In the latter case, digging into the joint revealed that only a few strands of the wire were held by solder, the rest by rosin.

Apparently there is enough difference of opinion between Nickerson and Jeffries to lead to some rejection by Nickerson of equipment passed by Jeffries. What appears to be needed is an early meeting between Jeffries on one hand and Nickerson and one of our engineers on the other.

Testing

The question of testing was taken up in the same manner with Mr. Jeffries. He explained his procedure. Then we explained ours. It was agreed that we would write up our test procedure and send it to them for inclusion in their test procedure.

Signed

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