

PROGRESS REPORT ON RCBC

R W Newport

1. CHAMBER AND VACUUM ASSEMBLY

1.1 Chamber Assembly

A contract for machining and assembly of the chamber has been placed with MORFAX Ltd. The turning of the main forgings is well advanced.

The tender action for the forgings for the end plates for the hydrogen shield and the vacuum tank has been completed and an order placed with Firth-Brown who were the only company out of eighteen to reply. The delivery period is 18 weeks.

1.2 Main Window

The blank was delivered to Grubb-Parsons early in October and we have now received from them a revised delivery date of 28 February 1979.

1.3 Window Gasket

All materials have been delivered and an order placed for spinnings. The tender action for the assembly will be completed in December. There has been some delay in this item due to the unavailability of suitable material for the spinnings which led to a revised design involving further stress analysis.

1.4 Vacuum Tank

An order for the vacuum tank, including a spare central section for beam entry and exit window development, has been placed with IMI Marston Ltd. The order also includes a 10 cm thick end plate which after pressure testing will be machined and used for trial fitting of the hydraulic actuator before the chamber assembly arrives in CERN.

Further analysis has shown filament wound glass reinforced plastic to be as good as boron fibre reinforced plastic for supporting the beam entry and exit windows. Discussions with manufacturers are at present directed towards obtaining samples for testing.

1.5 Beam Entry and Exit Windows

The manufacture of tools is proceeding, we have, however, on the advice of the manufacturer accepted a modified profile at the periphery of the window. This reduces the angular acceptance in the horizontal plane at 1.5 mm thickness to $\pm 11\frac{1}{2}^\circ$ cf 12° but the complete window aperture still remains at $\pm 13.5^\circ$.

2. OPTICAL SYSTEM

2.1 Telecentric Lenses

All elements required for the lenses have been ground and polished. The coating is expected to be completed by the end of February and the elements are expected to be mounted by the end of April.

We have received quotations for lens filters but neither is as called for in the specification and we are awaiting revised offers.

2.2 Lens Mounting Plate

The tender action has been completed and an order for the casting has been placed. The sub-mount castings have been received.

2.3 Illumination System

Further tests of flash tubes have been carried out at 50 joules and a few problems encountered, such as contamination of the cooling water due to electrochemical action, and arcing from the trigger electrode.

During the present tests 500,000 cycles have been performed with no depreciation of the light output despite the above problems.

Profile milled non-imaging concentrators have been made and plated. They are now being polished before being used for uniformity tests.

2.4 Small Windows

The tender has been completed and all small windows ordered from Grubb-Parsons. Delivery dates of April for the fused silica and June for the BK-7 windows are better than expected.

2.5 Data Board

A 39 channel fibre optics test piece has been received at CERN and is being prepared for tests.

The micro processor for the data box control system has been received.

We have also received the LED block from Plessey and have tested it and found it close to specification.

2.6 Cameras

Printed circuit motors for the cassette drive have performed satisfactorily up to 1500 gauss so that no shielding will be required.

A tender action for the manufacture and finishing of the capstans and their assembly to the Ferguson drive mechanisms is proceeding.

3. CHAMBER TEMPERATURE CONTROL SYSTEM

3.1 Valve Vessel

The manufacture of the vessel is well advanced but delivery has been delayed by the late arrival of the control valves. A new delivery date of January has now being given. The fabrication of the internal pipework is being discussed with potential manufacturers.

3.2 Valves

All control valves and actuators have been delivered and tested and have been handed over to the manufacturers of the valve vessel. Delivery was delayed by over two months due to personnel problems at the company.

3.3 Control System

Some 80% of the components have now been delivered.

4. EXPANSION SYSTEM

4.1 Bellows

The fifth bellow has been completed and is the best that we have made.

4.2 Bellows Test Rig

The components required for modifying the MAQUETTE are being manufactured and are due for delivery early in December.

4.3 Piston

All GRP components including the revised design of centre cone are available for the manufacture of the first prototype. We also have all material for the drive shaft. There is however a delay due to the difficulty in obtaining special high strength steel for the components required to join the drive shaft to the piston one of which has to be built into the piston.

4.4 Stainless Steel Bellows

A satisfactory design of bellows has been achieved but further design work is needed to solve the problems of attachment to a suitable piston.

5. VACUUM SYSTEM

We have taken delivery of a number of small components such as pressure gauges and control units and all the small rotary pumps for the pump-out systems.

The use of E0-6 diffusion pumps has now been approved by the CERN Safety Group and these together with appropriate valves have now been ordered.

6. MECHANICAL HANDLING

The chamber trolley has now been delivered to CERN where it will be tested before shipment to the Rutherford Laboratory. The rails have been installed at RL.

The static supports for the chamber assembly have been ordered.

7. ACCESSORIES FOR CONTROL AND MONITORING

The data logging system has been delivered from Credshire.

A programme for delivery and installation of control equipment has been prepared and provisionally accepted by CERN.

8. IRON STRUCTURE

After successful trial assembly at the River Don Works of the British Steel Corporation the structure was delivered to CERN before the end of October, over a month ahead of schedule.

The pedestals on which the structure is to be mounted have been delivered to CERN and the complete installation of the structure is expected early next year.

9. TRANSPORT TO CERN

Apart from the satisfactory delivery of the iron structure to CERN there is nothing further to report.

10. PROGRAMME

The latest programme, valid at 31.10.78 is attached. Points to note are:

- 10.1 The delivery of the chamber assembly to CERN at the end of February 1980, which is conditioned by the contract with MORFAX.
- 10.2 The early delivery of the vacuum tank to CERN which is based on a contractually agreed delivery date to RL.
- 10.3 The continued existence of useful amounts of slack in major chamber sub-systems although the valve vessel needs to be watched carefully.
- 10.4 The maintenance of the lens programme.
- 10.5 The delivery of the iron structure.

11. FINANCIAL

The financial statement valid at the 31.10.78 is attached. Points to note are:

- 11.1 The commitment has now reached £508,718 (excluding ~£7,000 of items committed at CERN in October).

- 11.2 The latest cost estimate which is 11% higher than the initial estimate after correction for inflation.
- 11.3 Taking into account commitments made during November, the total commitment is now ~£575,000 which is 72% of the latest cost estimate after correction for inflation.
- 11.4 RL have prepared invoices to CERN for the present CERN financial year which total ~£290,000.

TECHNOLOGY DIVISION
RUTHERFORD LABORATORY

29 November 1978

FINANCIAL STATEMENT
 RAPID CYCLING BUBBLE CHAMBER FOR EHS CERN
 PROJECT NOs NA71500 - NA71799 INCLUSIVE
 PROGRESS STATEMENT AS AT 31.10.78.

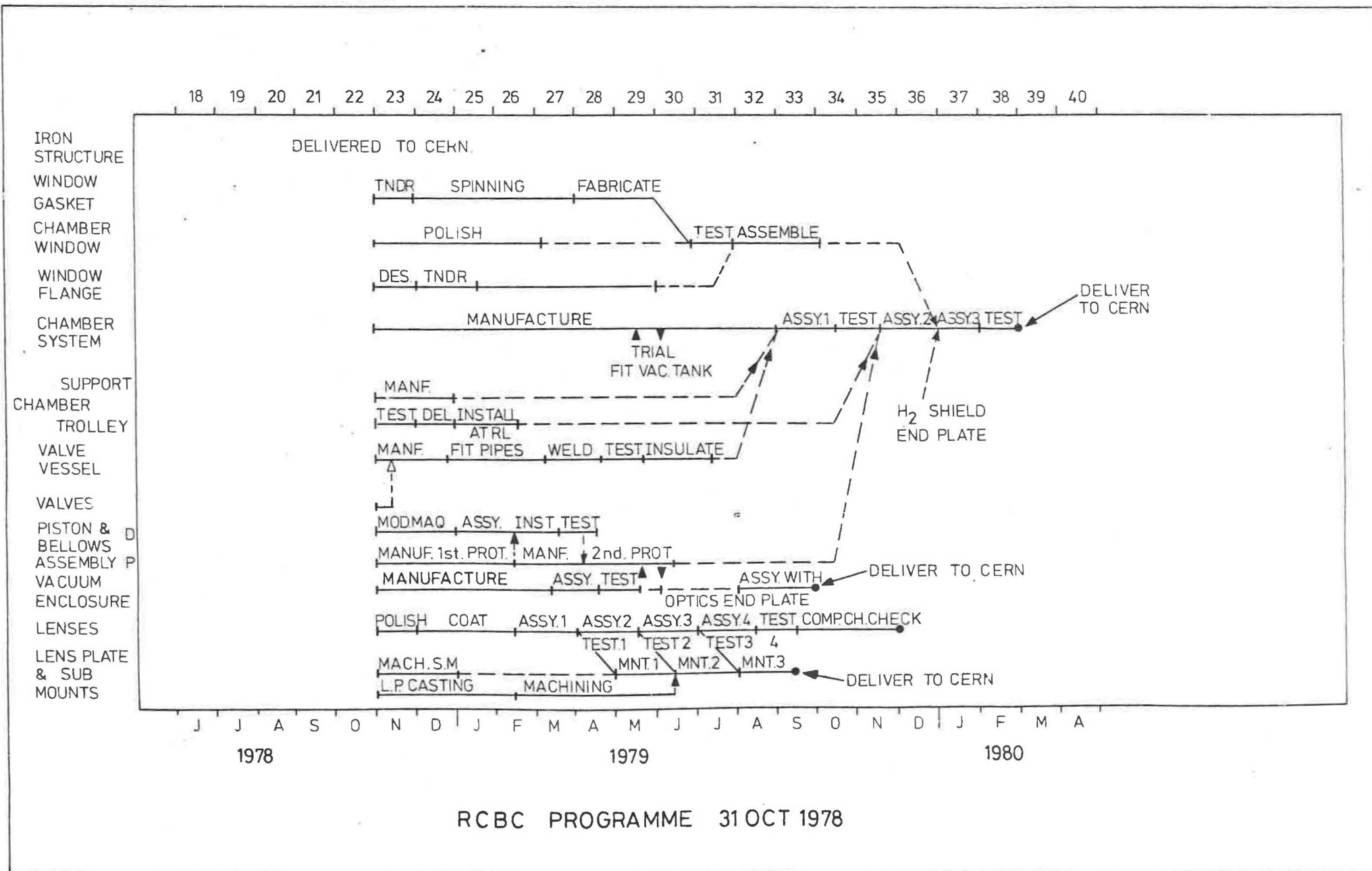
ITEM	INITIAL COST ESTIMATE 15.2.77	LATEST COST ESTIMATE * 31.10.78.	COMMITTED TO 30.10.78.	FORECAST DELIVERY DATE	TOTAL SPEND IN PRIOR YEARS	ACTUAL SPEND IN CURRENT YEAR TO 30.10.78.	SPEND FORECAST 1978/79
	£	£	£		£	£	£
1. Chamber & Vac Enclosure	297,235	313,096	238,963	28.2.80	178	122,293	—
2. Optical System	86,925	87,925	20,934	30.9.79	—	2,090	—
3. Chamber Temp Control	46,640	46,640	31,207	28.2.80	4	5,452	—
4. Expansion System	58,488	58,488	10,489	31.10.79	—	49	—
5. Vacuum Systems	36,559	51,394	48,172	30.9.79	—	11,270	—
6. Acc for Control etc	17,798	17,798	5,756	31.12.79	—	2,354	—
7. Mech Handling Equipt	29,120	29,120	16,343	28.2.80	—	2,250	—
8. Iron Support Structure	78,000	118,956	129,223 †	DELIVERED	—	5,181	—
9. Transport to CERN	18,200	18,200	7,631	—	102	29	—
10. Miscellaneous	1,040	1,040	—	31.12.79	—	—	—
	670,000	742,657	508,718	—	284	150,968	350,000

†£9,500 will be paid from another
CERN budget.

Contract Price £670,000 (+ 15% Contingency)
at 15.2.77 prices.

* at 15.2.77 prices.

All prices exclude VAT.



RCBC PROGRAMME 31 OCT 1978