79.

On Her Majesty's Service

WASC 479.

RBC Tom Tom

WASA 479/1.

SHOT LIST		LOCATION
MS	Waltham Abbey passers-by	Waltham Abbey
LS	W/A Clock Tower, pan down CU to Powder Mill Lane sign	Outside ERDE
LS	Cattle outside ERDE in field. Car approaches gate. Police check pass	ERDE gate area in distance
LS	Powerboat on canal	

LS	Remote control railway engine pulling canister Trees & building in b/g	
CU	Interior, face of operator	
CU	Interior, turntable sign	
CU	Interior, ditto switching	
MS	Train on to roundabout	
LS	Subjective shot from train	
MS	Train off roundabout	
CU	Model of building	
MS	Control panel	
CU	Train along curve	Remote Control Area
CU	Reflection shot of control panel	
CU	Button pressed	
MS	Train	
CU	Subjective shot through door from train and on to first roundabout indoors	
MS	Interior, train on roundabout turning	
MS	Operator at slave manipulators	
CU	Canister being raised	
CU	Canister rising through cabinet floor, lifted by slave manipulators	
CS/ MCS	Various shots of operator and inside of cabinet	

SHOT LIST		LOCATION
CU	Notice: Explosives area "Keep Clear". Pan to bunker	
CS	Cylinder. Two men go into bunker	
MS/ LS	They appear on other side (inside bunker) Emplacing cylinder	
CS	Wrapping of wires	
LS	Cylinder hanging in place Men make off	Explosive sensitive area bunker
LS	High shot bunker	
CU	Cylinder	
CU	Steel container from side	
MS	Technician at detonator	
HS	Bunker	
CU	Detonator	
CU	Explosion from side	
CU	Debris	
CU	Water in pool. Tilt up to show ropes suspending charge. Personnel arranging experiment	
MCS	Interior, assistant doing countdown	Underwater test Pool
MCS	Whip-pans between spectators waiting for explosion	
CS	Detonation switch	
MS	Various shots of water spout explosion & subsidence - waves, etc.	

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WAC/2/023

Notes on a visit to ERDE by Mr. Harry Cowdie,
Researcher for the BBC Television programme
"Tom Tom", 23rd September, 1968.

Present Mr. J.V. Griffiths, E.S.O.
Mr. M. McLaren, I.S.
Dr. J. Powling, P.1
Mr. E.G. Whitbread, S.E.
Mr. H. Cowdie, BBC Bristol
Miss S. Kyle, Mintech PSI5b

The visit was arranged by Mr. McLaren at the request of Miss Kyle.

After the discussion of an outline of Mr. Cowdie's requirements a tour, including films and experiments, was arranged:

E Branch
Sensitiveness
Detonation (Newton's Pool)
Advanced Explosives Research
P1 Branch
Combustion.

Later on 25th. September, Miss Kyle telephoned to ask if ERDE would be prepared for the filming to take place on Wednesday, 2nd. October, 11am - 5.30pm and Thursday, 3rd. October, 10am - 5.30pm.

With the agreement of Mr. Whitbread and Dr. Powling, Miss Kyle was told that these dates and times were convenient to ERDE.

Mr. Cowdie telephoned on 25th. September to state his detailed requirements:

1. E. Branch - Sensitiveness
   a) Experiment showing ignition in armoured cupboard
   b) Experiment showing electrical initiation
   c) Experiment showing initiation by friction
   d) One or two sequences of the display of fragments of large sealed vessels.
   e) One firing of a large sealed vessel in Firing Point No. 1.

2. L.S.
   View of old Powder Boat in its usual position opposite Library entrance.

3. E Branch - Detonation
   a) Two underwater firings in Newton's Pool
   b) A similar sequence for the "count-down" to that in the film "Underwater Explosives Assessment".
   c) A similar sequence for the control panel procedure for firing to that in the film.

4. E Branch - Advanced Explosives Research
   a) Preparation
   b) Narrow gauge railway
   c) Control Panel

5. P.1 Branch - Combustion
   Strand burning experiment with "spectacular" composition.

With/

With the agreement of Mr. Whitbread and Dr. Powling, Mr. Cowdie was told (Bristol 32211 Ext. 375) that ERDE would meet these requirements. Mr. Whitbread's agreement was subject to the condition that all the Sensitiveness Section filming could be completed on Wednesday, 2nd October.

Mr. Cowdie undertook to make the "rough cut" film available through PSI5b for Technical Security to see.

Mr. Cowdie stated that there would be a 4 man camera team and himself at ERDE on 2nd. and 3rd. October and asked if arrangements could be made for lunch.

Miss Kyle, when asked, said that she thought that no one from PSI5b would be at ERDE during the filming.

Actions

ERDE

SE To arrange the setting up of experiments involving E Branch.

Dr. Powling:
To arrange the setting up of the combustion experiments.

Mr. McLaren:
i) To arrange for the Powder Boat to be moved to a position opposite the Library.

ii) To arrange for lunches on 2 - 3 October for 5 visitors.

PSI5b

Miss Kyle:
To arrange for rough cut film to be made available to T.S.

26th. September, 1968

M. McLaren
Information Service

Distribution

Internal
PS/D
Mr. G.K. Adams
S.E.
Dr. J. Powling
Mr. J.V. Griffiths
Security Officer
Mr. M. McLaren
File

External
PSI5b - Miss S. Kyle
TS - Mr. T.B.F. Ashwell

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~~£ 64A~~

TCA TCA - DUBBING SCRIPT — EXPLOSIVES RESEARCH (67/18/2480)

13 In Waltham Abbey no one gives a second thought to these far-off noises. Right at the edge of the town lies this secret expanse of laboratories, and no-one can get past the gates without a pass.

38 The old powder-mill disappeared long ago, but not the canal. In a powder-boat like this, Guy Fawkes probably slipped his barrels of gunpowder down to London.

54 Today, a remote-controlled railway is used by scientists as a safer form of transport. Controlled from a switchboard panel, the railway carries a canister of dangerous explosive on its way into a specially constructed building.

80 The walls will resist an explosion, but there's nothing special about the roof. So if anything did go wrong all the force of the explosion would go upwards.

102 But on the other side of these strong walls people can work at the controls quite safely. That's the theory; it's never been tested in practice. (PAUSE)

The main work here is to develop all the explosives needed by the Army, Navy and Air Force. This includes solid-fuel propellants - rather like solid-fuel for model aeroplanes.

139 When new explosives are being processed you can never be a hundred-per-cent certain what will happen, so from the railway the canister has to be raised into a cabinet where mechanical arms can grab the container, and get at the explosive inside it.

170 Apart from explosives, the scientists have developed the fuel for the British space research rocket Skylark, and the guided missiles Thunderbird and Bloodhound - they need a fuel that will produce a powerful thrust and burn steadily - without blowing up.

192 But their work here also leads to more peaceful products, such as ejector seats, explosive charges for starting high-compression engines, line-throwing rockets for climbers, yachtsmen and coastguards.

217 When a new explosive is produced, one thing people will want to know is how it's going to behave when stored in a confined area - what sort of things can accidentally make it explode and what exactly will happen when it does?

239 By blowing up a steel cylinder, packed with explosive, in an earth-built bunker, scientists can find out some of the answers.

252 When an electric current is passed through the cylinder the high explosives compressed inside will rip it apart with a force of 20,000 pounds per square inch. But the real question is: will it go off at once, or a few seconds, or even minutes, after the current is switched on? In other words, if something goes wrong when this material is stored, is there time to do anything about it?

308 The charge is set.

320 In his laboratory the scientist puts the wires to the detonator.....

326 With an explosion like that you don't bother to send a fire engine in.

339 Some explosives are so powerful that their force can only be measured when they're exploded under a million gallons of water.

349 Dangling at the end of that rope, several feet below the surface, there's an explosive which will blow a ton of this water 150 feet into the air.

363 Everything is ready.

397 For the scientists at Waltham Abbey, it's all in a day's work!

TCN TCH - DUBBING SCRIPT — EXPLOSIVES RESEARCH
(67/18/2480)

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30.10.68

Mercury (local paper)

ERDE or BBC 1 Television

Queries

1. What was shown?
2. Is it first time that explosives at ERDE have been featured?
3. How long was BBC here?

Answers

1. AER, Sensit, Newton Rigg
2. Yes
3. 2 days.

Cowdry phoned 17.10.68 + told:

479/4

(1) Weight of explosive
Few or several pounds according to slant RSRE requires

(2) Weight of water in air
about 1 ton
(assuming solid column)
6" diam.

(3) Height of plume 1500 feet

(4) Capacity of Newtons Pool
1 million gallons

(5) Depth of Pool 15 – 20 feet

(6) Charge fired $\frac{1}{2}$ way down

(1) Remote control
built to withstand
15lb. TNT.

(2) Space research
ERDE responsible for R+D + initial
manuf of the propellant for the
Skylark Upper Atmosphere
Research rocket
— the biggest solid propellant
rocket developed by U.K.
— used for investigations of
upper atmosphere and ionosphere
Academic studies.
100 have been fired
Height 200,000 feet
Some to 100 miles

(3) Peaceful uses

Ejection seat
Fire extinguisher
Line throwing rocket
for amateur use
eg yachtsmen
Coastguard rocket
Starter cartridges for aircraft engines
Line charge for
Sonic bang simulants
use in RAE Farnborough
experiments were
developed by ERDE
Explosives used for to
provide a shock pressure
to modify crystal structure
- use as catalysts.

(4) Sealed vessel

Thickness $\frac{3}{8}$"

Weight 30 lb

Weight of explosive

$2\frac{1}{2}$ lb – 7 lb

according to density

Bursting pressure of

sealed vessel

20,000 psi

Pressure of explosive can

just be sufficient

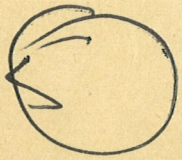
when case will split

or be enormously

overmatched when the

vessel will break up ~~small~~

small fragments



Newton's Pool Experiment

Aim is to achieve better explosives

2 ways in which to do this

(i) Arrange to obtain more energy per unit volume or per unit weight but there is a limit to this.

(ii) by studying the chemistry of explosives it can be seen that it is possible to change the rate at which the energy is released

S "
cont'd

The idea being to match the rate of energy release to the application.

~~But with~~ even the slowest rate of release is extremely fast and rate cannot be measured by ordinary means.

But if the explosive is detonated underwater then the pressure-time signature of the shock wave provides a measure of the rate at which energy is released.

Factual data not releasable for obvious reasons with experiment aimed at improving explosive