

## MINUTES OF THE 1994 BUSINESS MEETING OF THE CONTROLLED ENVIRONMENT USERS GROUP

The annual meeting of the CE Users Group was held on Tuesday 6th September 1994 at the University of Aberystwyth.

The meeting opened at 21.00 hours.

The Chairman, L.D.Incoll, opened the meeting, welcoming newcomers and explaining the purpose of the meeting.

Apologies were received from C.C.Hole, G.Crowhurst and S.Cranston.

### 1. Minutes of Previous Meeting

The minutes of the 1993 meeting, held at the University of Leicester Botanic Gardens, were approved.

### 2. Matters Arising

**M93/7a.** Harry Smith's department at Leicester had used LEDs for red / far red and will send information to be included with the minutes.

G .Taylor of Sanyo-Gallenkamp had seen super red LEDs from Japan at a seminar in Holland and will send information to be included with the minutes.

**M93/8.** The light sensor test at Leicester had been a "complete disaster", nobody except Skye was prepared to do the test as suggested by L. Incoll, the other manufacturers / suppliers made various excuses.

### 3. Management, Staffing, Running Costs

R. Randall of HRI, Littlehampton asked if anybody monitored energy and hence costs of running cabinets/rooms. I. Pearlman of Rothamsted said they ran occasional tests. A. Nichols of JII said they had turned off their Weiss rooms and tested the cooling units. J. Franklin of Rothamsted used per unit area costing. A. Nichols also used maintenance costing. A. Williams of Sanyo-Gallenkamp asked if lighting cost was the main variable in budgets. Leicester University meter their cabinets at the distribution board because of the high costs of running.

A long discussion took place on basic costings and how users are charged. G.Taylor asked if energy use was costed when people buy new cabinets/rooms. A.Morgan of HRI, Wellsbourne said that their recent specification for four new cabinets, included a request for information on basic energy usage eg. max. heating with lights on, max. cooling with lights on.

Manufacturers' representatives said that it was impossible at present to quote standard running costs and suggested that there should be a set of standard figures for the manufacturers to work on. After discussion it was decided that the standard conditions should be :-

(i)Day                    25°C, 20°C, 15°C, at 60%rh                    and 12 h duration

(ii) Night 20°C, 15°C, 10°C, at 70% rh and 12 h duration

with lights at nominally 400  $\mu\text{mol m}^{-2} \text{s}^{-1}$ , 500 mm from the cabinet floor.

L. Incoll of Leeds said that people seemed to be using CE cabinets as expensive growth rooms, by over specifying requirements. R.Hughes of Long Ashton suggested people bring any information on running costs of various cabinets to next year's meeting.

A.Roylance of Vindons drew attention to the costs of RO / Distilled water; most people appeared to take this into account when costing. He offered to supply information on current consumption for one of Vindon's cabinets. The data (appended) shows an estimated average consumption over a 24-h period of 6 A.

#### 4. Maintenance, Servicing, Spares

No points were raised.

#### 5. Control Systems

No points were raised.

#### 6. Humidification and Irrigation

- (a) L.Incoll raised the question of ultrasonic humidification and whether there had been any recent advances. G.Taylor replied that there various types on the market, all were costly to buy but were very effective when used appropriately, R&M costs are low and they are all simple and efficient.
- (b) R.Randall raised the question of water disposal from CE cabinets to conform to NRA guide-lines. A.Nichols asked about *Legionella* and it was agreed that good maintenance and general cleanliness were essential. C.Eagles of IGER, Aberystwyth asked if a recirculating system was more prone to *Legionella*, but no-one had an answer. The general conclusion was that there was a lack of information and scientific base. Various institutes use outside companies to check their systems on a regular basis.

There were no comments on irrigation.

#### 7. Lighting

L.Incoll pointed out that this was the main theme last year. A.Roylance said that after last year's meeting they now paint their cabinets white internally. R.Randall pointed out that tests showed that a mirror finish gives very even lighting. G.Taylor stated that they use a cosine-corrected Kipp and Zonen sensor in their tests.

The meeting proceeded to discuss the effect of light on the conditions in the cabinets. It was suggested that if you have high light levels in cabinets it is difficult to maintain low temperatures. G.Taylor suggested that uniform temperatures are more important than highly accurate ones.

There was a long discussion on standardisation of measuring temperature and humidity in cabinets. It was decided that an aspirated reflective screened device was necessary. L.Incoll said that the USA had published a specification for measuring temperature and humidity. R.Randall suggested that a small group should be set up to formulate a standard which we could work to, based on the US specification. G.Taylor said he would be willing to help.

## **8. Instrumentation, Sensors, Monitoring**

- (a) J.Franklin noted that the Envirocon can now use Vaisala or Rotronic units for humidity measurement and they are better than wet and dry bulb systems as far as maintenance is concerned.
- (b) J.Franklin and R.Hughes are testing Geotechnics CO<sub>2</sub> alarm units for CE rooms. J.Franklin said that some manufacturers use oxygen depletion measurement for their CO<sub>2</sub> alarm systems. R.Hughes and J.Franklin said that under COSHH assessment they could not raise their rooms to dangerous (above safe) levels.
- (c) A.Gay of IGER, Aberystwyth stated that if anyone was thinking of using Labtech Notebook for control / monitoring of CE facilities he would be pleased to give them the benefit of their (IGER) experience.

## **9. Heat Reclamation and Energy Management**

No points were raised.

## **10. Fabric, Glazing, Reflective Materials**

No points were raised

## **11. New Equipment, Recent Advances**

J.Franklin have made two simple cabinets of 1.0 m<sup>3</sup> for approximately £1000 each. Polycarb walls, Perspex ceiling, 10-20°C +/- 1°C, 1-400W SONT lamp, small air handling unit to control temperature, for use within a glasshouse. Details are appended to the minutes.

## **12. Plant Growth Problems**

A.Roylance asked if there was a list of known phytotoxic materials. G.Taylor said they test all new materials using independent laboratories. There was a discussion on the way materials were tested for phytotoxicity. Various methods are used, from small cabinets to belljars inside cabinets, growing plants together with a sample of the material.

## **13. Safety**

No points were raised

## **14. Accounts**

A.Nichols had set-up a bank account in the name of "UK Controlled Environment Users Group" with A Nichols, J Aldous and L.Incoll as signatories. A.Nichols presented a Treasurer's report of which everybody had a copy. The balance stood at

£1153.80. L.Incoll explained that the money will be used to support the scientific meetings of the group.

A lively discussion followed L.Incoll's comment that although manufacturers introduction into the group a few years ago had been a good thing. They should not use the meetings to promote their products, or expect an exhibition facility every year. Only if they have products at the site where the meeting is being held and it is relevant to the subject being discussed would demonstrations be countenanced. It was finally agreed that a trend towards a trade show was to be discouraged and it was to remain as it was originally set-up, a user group meeting.

R.Woodfin of Imperial College, Silwood Park said that if a newsletter was thought to be appropriate, he would act as a central clearing for all information to be included. It was decided that a list of headings for a possible newsletter be appended to the minutes.

#### **15. Date and Place of Next Meeting**

HRI Wellesbourne, the proposed venue for the site visit, suggested the dates 12th/13th September 1995. Because of restructuring Wellesbourne will be without conference facilities at that time, so it was suggested that Warwick University and Warwickshire Agricultural College should be investigated for conference facilities and accommodation.

L.Incoll suggested the possibility of an American speaker, but on reflection decided that it was probably too late to organise as it would need a couple of weeks visiting to make it worthwhile. G.Taylor said he would investigate the Swedish CE User Group with a view to possible participation.

The following themes/talks were suggested:-

Application of CE in Climatic Change.

Water use and treatment, disposal, *Legionella* etc.

Data Logging and Instrumentation.

For 1996, R.Woodfin suggested Silwood Park (Imperial College), though accommodation might be a problem there.

#### **16. Any Other Business**

The Chairman noted that Roy Randall was about to retire from HRI, but will remain a member of the group. He proposed a vote of thanks for Roy's input over the years (1968-1994) and wished him well for the future.

The meeting closed at 23.15

Alan Morgan (HRI, Wellesbourne),

Recorder,

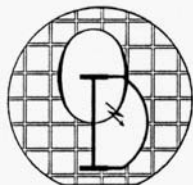
9 February 1995

**LIST OF PARTICIPANTS**  
**CONTROLLED ENVIRONMENTAL USERS' GROUP MEETING 1994**  
**AT THE INSTITUTE OF GRASSLAND AND ENVIRONMENTAL RESEARCH**  
**Plas Gogerddan, Aberystwyth, Dyfed**

Abbott C.	University of York	Incoll L.D.	University of Leeds
Aldous J.	John Innes Centre		
Ashley G.	Heraeus Equipment Ltd	Lappage M.G.	University of Leeds
		McNaughton I.	SCRI, Invergowrie
Baker I.	Vindon Scientific	Morgan A.	HRI, Wellesbourne
Beale G.R.	Sanyo Gallenkamp		
Bennett M.	University of Warwick	Newell C.A.	Axis Genetics Ltd
Benskin G.	University of Leicester	Nichols D.A.	John Innes Centre
Bignell G.	Nickerson Biochem Ltd		
Blackledge W.E.	University of Lancaster		
Bosworth D.	HSE, Bootle	Parkinson R.G.	LARS, Bristol
		Pearman I.	Rothamsted Exp. Sta.
		Peirce R.G.	HRI, Littlehampton
Cross A.	IIBC, Silwood Park	Pevrie S.	SCRI, Invergowrie
Crothers S.	Dept of Agriculture, NI	Pratt MX.	University of Leicester
Crowe S.	University of Warwick		
Crowhurst G.E.	HRI, Wellesbourne	Randall R	HRI, Littlehampton
		Roylance A.	Vindon Scientific
Deadman M.	University of Reading	Scott I.	U. Wales, Aberystwyth
		Scott R.	University of Leicester
		Sim A.	MLURI, Aberdeen
		Small P.	IC, Silwood Park
Eagles C.F.	IGER, Aberystwyth	Smith G.	Heraeus Equipment Ltd
		Smith S.	University of Leicester
Foyer C.F.	IGER, Aberystwyth	Sykes G.	Aberystwyth
Franklin J.	Rothamsted Exp. Station		
		Taylor G.K.	Sanyo Gallenkamp
Gaskin J.	University of Nottingham	Toler R.J.	IGER, Aberystwyth
Gay A.P.	IGER, Aberystwyth	Turner P.R	LARS, Bristol
Gilbert I.	University of Leicester	Turner W.T.D.	Town and Country
Gill P.	SCRI, Invergowrie		
Gilliam D.J.	AgrEvo UK Limited	Warne D.E.	Axis Genetics Ltd
Gray D.	SCRI, Invergowrie	Wilkinson J.R	University of Lancaster
		Williams T.E.	Aberystwyth
Henley P.	U. Wales, Aberystwyth	Woodfin R.M.	IC, Silwood Park
Hughes R.F.	LARS, Bristol	Woolverton S.M.	AgrEvo UK Ltd

## APPENDIX

## 1. For Minute 2:



## QUANTUM DEVICES, INC.

112 Orbison Barneveld, WI 53507 (608)924-3000 Fax(608)924-3007

### Q-BEAM 2200-A

#### The QBeam<sub>TM</sub> Solid State Lighting System for Photosynthesis

The QBeam technology is a patented solid state lighting system offering a high degree of reliability, repeatability of measurement, and portability. The solid state light source is cool to the touch, even when operating at maximum intensity.

The QBeam solid state light source is composed of a monolithic array of hybrid GaAlAs light emitting diodes designed to emit diffused monochromatic light. The chips have been custom fabricated to emit specific peak wavelengths of photon energy. This eliminates the unnecessary infrared energy found in other light sources and the need for extensive cooling. The lamp has virtually no hysteresis, making frequent intensity settings accurately repeatable.

#### Photosynthesis Applications:

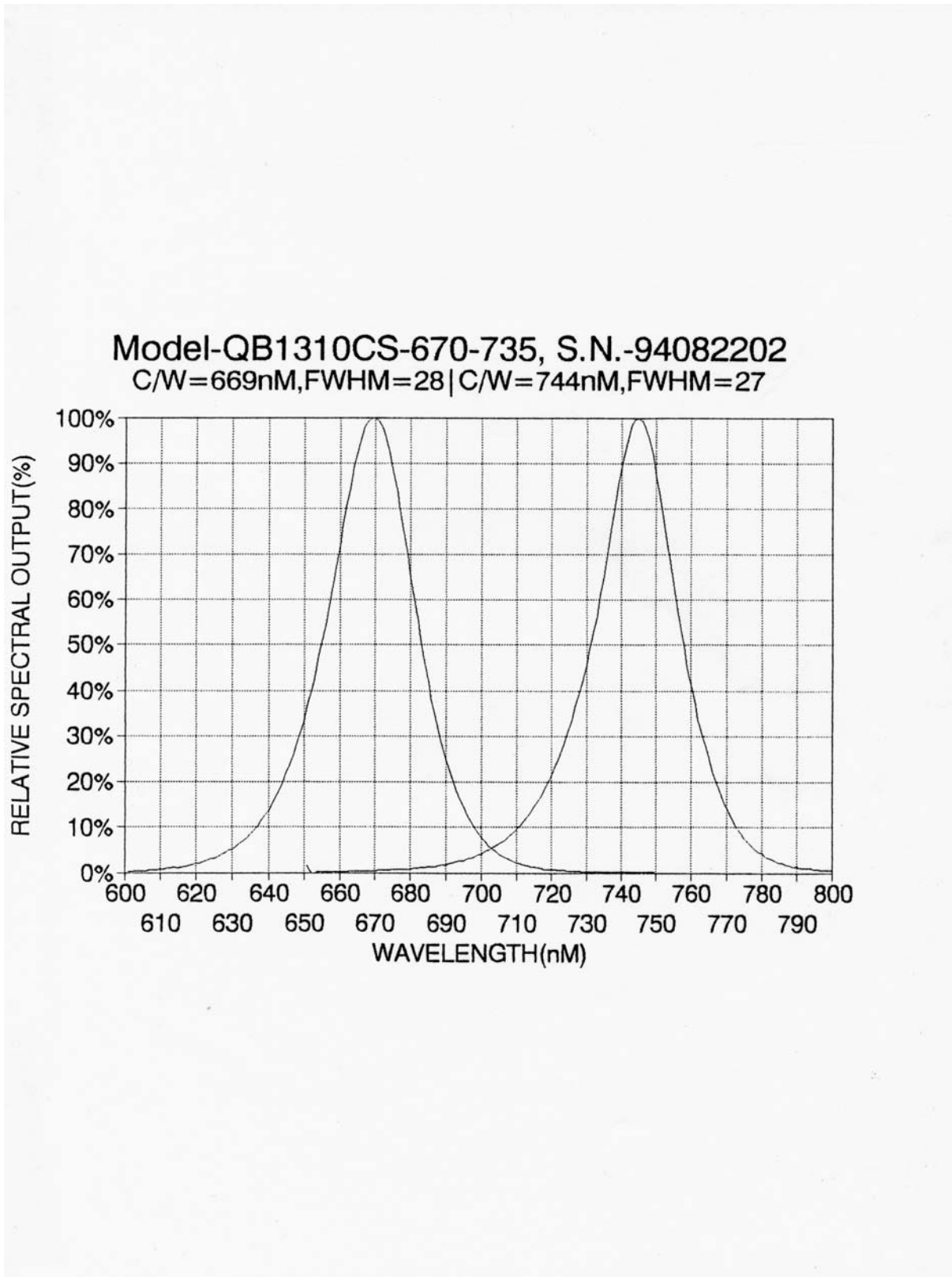
A wide selection of lamp sizes enables the user to attach the source directly to many available leaf chambers. The QBeam lamp eliminates the confounding of leaf temperature with photosynthetic activity because of the absence of infrared radiant energy.

Leaf photosynthesis measurements have become increasingly more accurate with the use of controls for leaf temperature, gas concentrations, gas flow, improved IRGAs, and a better theoretical understanding of the photosynthetic process. Now, light intensity and light quality can be easily controlled, in the lab or field, by use of the QBeam solid state technology.

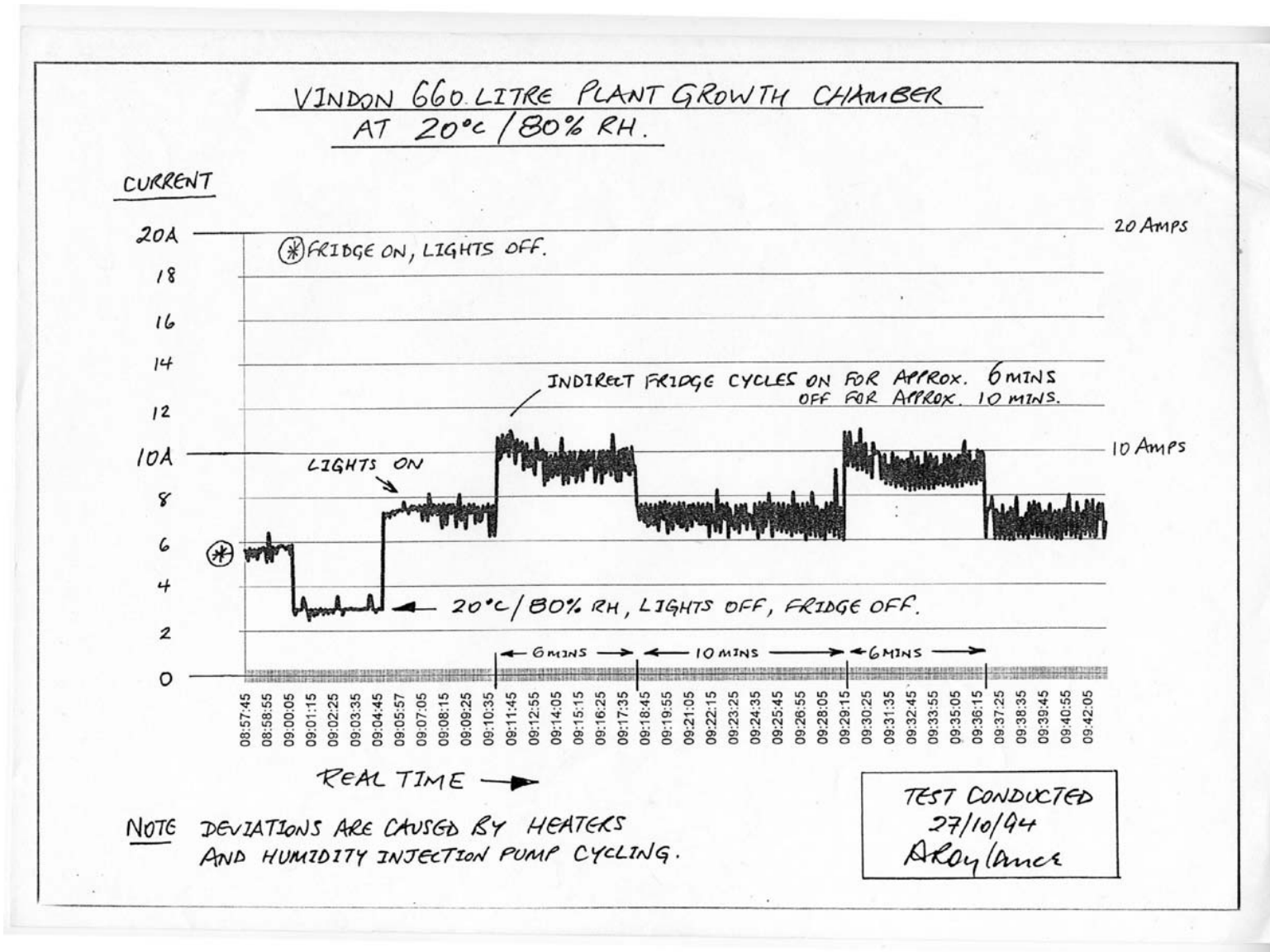
The QBeam continuous photon output can be controlled from near zero to full intensity (1500 to 2000  $\mu\text{mol m}^{-2} \text{s}^{-1}$  @ 670nm) dependent on experimental configurations. This wide range of light intensity is accompanied by no more than 10nm shift in peak wavelength, which is a great advantage for the study of photosynthetic response to light.

#### QB-2200-A QBeam System Features

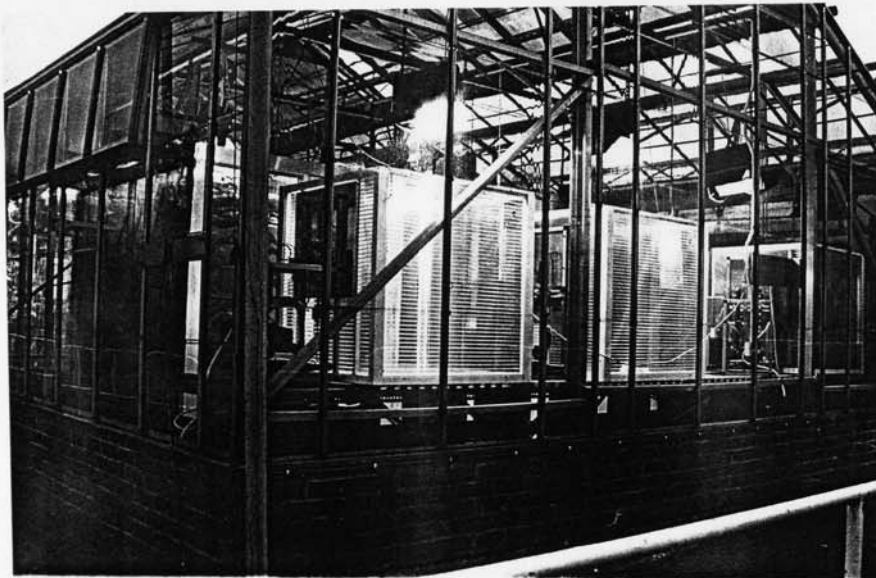
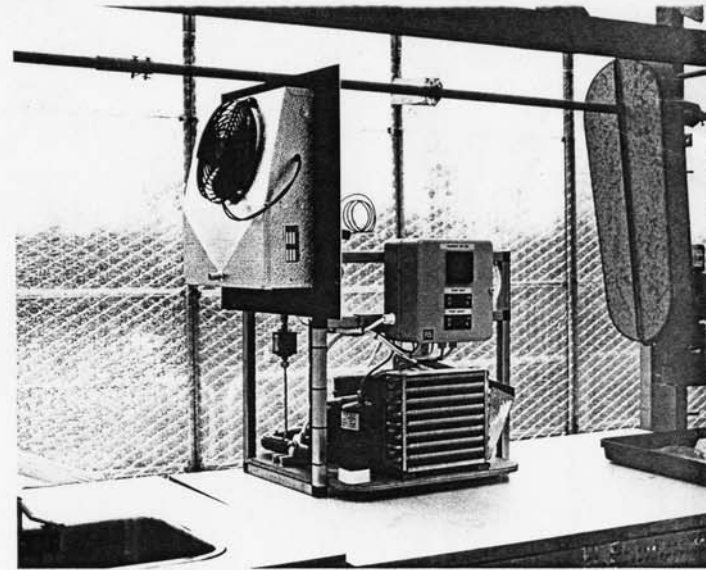
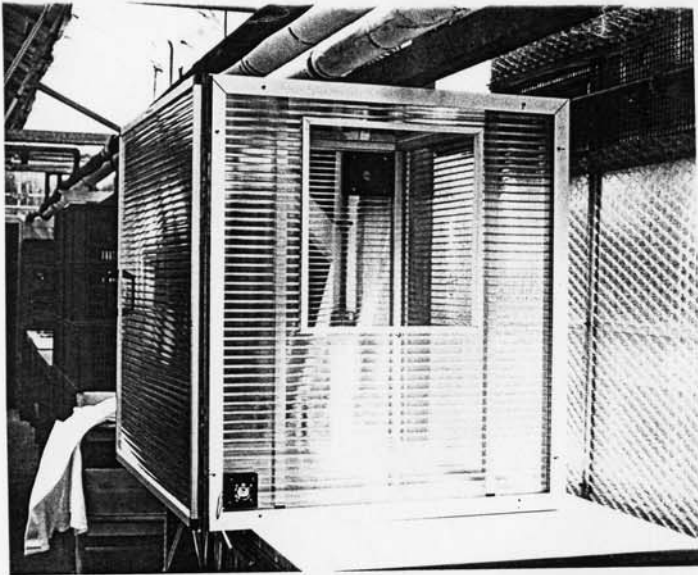
- \* Variable Intensity Control
- \* Ability to energize two separate monolithic LED arrays
- \* Ratiometric Control for Proportional Intensity settings
- \* Duration Timer Adjustable between .1 and 9.9 seconds
- \* Small Control Console Footprint: 21.6 x 7.6 x 22.9cm (8.5"x3"x9")
- \* Power Requirements: 10.5 to 14.0 VDC
- \* Consult Factory for Peak Wavelengths between 650nm to 940nm
- \* Consult Factory for Custom Configurations

**2. For Minute 2:**

3. For Minute 3:



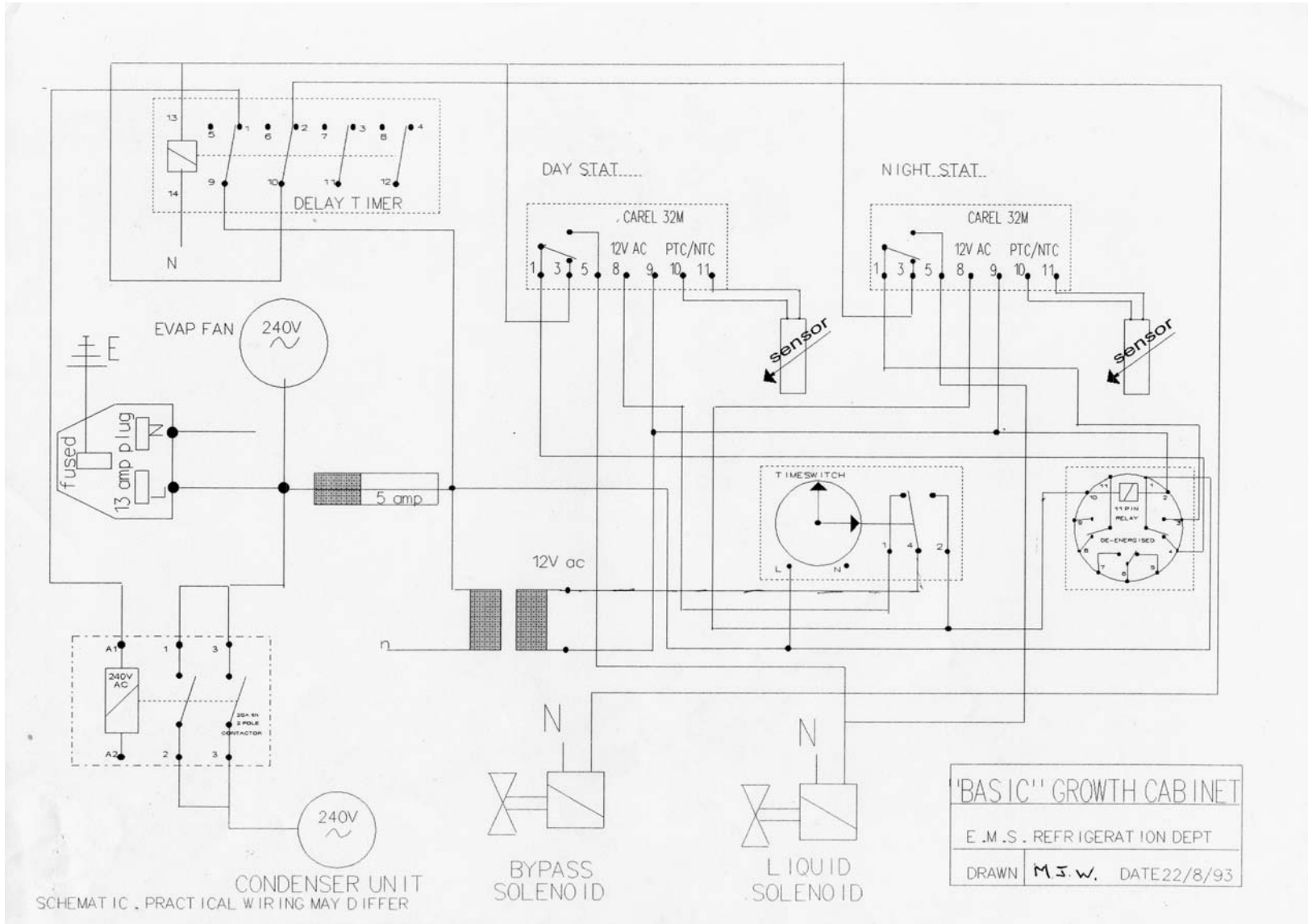
4. For Minute 11:



ROTHAMSTED EXPERIMENTAL STATION  
WEST COMMON, HARPENDEN, HERTS AL5 2JQ  
**DESIGN AND MANUFACTURE**  
E.M.S. REFRIGERATION DEPT  
CONTACT 0582 763133 EXT 2562/2568.



6. For Minute 11



7. For Minute 11

