

TC322 MANUAL

Ref. TC322C/H0456- V2.34 Issue 2 - 11.8.99

INSTALLATION

Refer to drawing, reference TC322 1 zone system. All component parts of a complete single zone system are shown for up to 12 crop sensors, the printer is optional.

Console

To mount the enclosure use the mounting bracket fixings, there are four of them. Connect the console to a 230V AC supply ensuring it is correctly earthed. There is no need to remove the enclosure cover (console front panel). Duct/ambient temperature, RH sensor and relay card connect to the console.

Relay Card

This PCB assembly should be mounted within the ventilation switch gear housing or an enclosure where it is protected from the environment and cannot be touched in normal use, it will have mains power present.

Crop Sensor Junction Boxes

Four mounting lugs are provided for fixing these boxes, if severe condensation is normal within the store mount in a vertical position. Each box has a 20m lead and they are connected in cascade when more than one is installed, upto a maximum of 3 boxes. For more than 12 sensors, the additional junction boxes are connected to the second crop sensor socket on the console. Up to four crop sensors plug into each box, the box should then have the correct self-adhesive labels fixed on depending upon how many sensors the system has. Labels should be sited such that after installation they are clearly visible. Additional extension leads are available for junction box and sensors.

Ambient Sensor

Any of the sensors supplied can be connected to the console AMBIENT sensor socket. Mount the sensor itself slightly away from any structure and on a northerly face of the building to avoid the direct effect of the sun. Additional shielding may be required in exposed situations. The Ambient Sensor labels should be fixed onto this sensor at each end.

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Duct Sensor

Any sensor supplied can be connected to the console DUCT sensor socket. Mount the sensor itself away from any structure and where it will sense air that is completely mixed downstream of the ventilating fan. The Duct Sensor labels should be fixed onto this sensor at each end.

Crop Sensors

Crop sensors should be evenly distributed throughout the stored crop. Ensure connecting cables are mounted where they will not be walked on or damaged. The sensors should be inserted into the stored vegetables through rigid plastic tubing of at least 10mm internal diameter (specialised advice on this is **STRONGLY** recommended however). All sensors should be marked both ends by using the labels provided with the system.

HOW TO USE THE SYSTEM

WARNING

THIS PRODUCT SHOULD ONLY BE USED IN CONJUNCTION WITH A CROP CONDITIONING AND STORAGE MANAGEMENT REGIME.

**IF IN DOUBT A QUALIFIED AGRONOMIST SHOULD BE CONSULTED,
ROBYDOME LIMITED CANNOT GIVE DETAILED ADVICE.**

Console - General

The power ON/OFF switch is located on the side panel of the enclosure. All system functions are controlled from the keys and a rocker switch on the front panel.

During long periods of non-use keep the console powered up, the small amount of heat it dissipates will help keep out moisture.

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Getting Started

Isolate the ventilation system in order that console familiarisation can proceed without starting and stopping the fan and associated equipment.

1. Check the clock first, press the CLOCK key to do this.
Now use the HELP key to gain familiarisation with the help system on the console.
Read the information as it appears on the display, it will automatically scroll the next message up or, if you want to proceed faster, press HELP again and the next piece of information will appear.
Use this technique on all other keys, no matter what mode the controller is in, the HELP system will always give relevant information at that point, the system is contextual.

Secret Set Up Routine

Some basic and important set-up information has to be programmed into the console before it is used. The following steps need to be carried out as a commissioning stage.

1. Ensure console is switched OFF.
2. Hold the SET UP key and switch ON.
3. When the display reads "SECRET MODE" release the SET UP key.
4. Now set each function as follows using the SET UP key to page through each function, use + and - keys to change settings.
 - a) Maximum crop sensors; 1 to 48, set according to number of sensors connected to the system.
 - b) Crop Read; set for average calculation of temperature on crop sensors or for ventilation to be initiated on the highest reading sensor, average is recommended.
 - c) Pre-set Time; this is the wait time once the main FAN has started, typical time is 15 minutes to avoid more than 4 start-ups for hour (also refer to flow diagrams).
 - d) Pre-set time 2; check flow diagrams for this setting; particularly Prog 4 Box 14.

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- e) Pulse Time; set this depending on the operating speed of the louvre system, it is the ON time of the motors.
- f) Off peak electric; two off peak periods are available, during those times the REFRIGERATION plant will run normally making use of the lower priced electricity.

Two times are shown for each period, the first is the start of the off peak time whilst the second is the end.

If only one period is available from the supply company set PERIOD 1 first time to the start of the economy period and the second time to the end of the economy period. This should not use the time 00.00. PERIOD 2 start and stop times to the same time, eg 00:00-00:00.

Refer to flow charts, programs 4 and 6 and check box 15 in both cases to establish the mode of operation.

Off peak settings only effect programs 4 and 6.

- g) Set printer; use the arrow keys to set the console up for connection to a printer. COM2 = PR402 printer (norm). PRN = PR40 printer.

When neither facility is used ignore this set-up feature.

- h) Set Duct Channel; use arrow keys to select the connection configuration for the DUCT SENSOR.

Channel 2 is normal and requires that the sensor connects directly to the console via the 4 way socket marked DUCT. Channel 18 is for special applications, please refer to ROBYDOME for specific information.

- i) Set Programs; this facility allows any program (refer to flow charts 1 to 7) to become inaccessible to the operator during normal operating conditions.

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Use the arrow keys to select/deselect programs, the UP key (+) selects whilst pressing DOWN (-) deselects.

To go to the next program press set-up key again.

Note that selected programs are denoted by a set of characters (numbers followed by letters) appearing after the program number. Deselected programs have no following characters.

Continue to use the set-up key until the end of the secret sequence is reached, the display will show "Set Exit". The console will now revert back to normal operation. Alternatively switch the console OFF at any time during "Secret" operation and upon switching ON normal operation is restored. **IMPORTANT** - The secret setting changed **MUST** be confirmed to the console by pressing the SET-UP or ENTER keys before reverting back to normal operation.

USING THE CONSOLE

1. Select MANUAL control on the MODE SELECT rocker switch.
2. Use the HELP system as before to receive instructions on how to use this and other functions. Manual is particularly useful for system commissioning and trouble shooting.
3. Now select AUTO and choose which program is required, use PROG key and refer to the flow diagrams to help with this selection. The arrow key will scroll programs on the display to allow selection. Press the enter key after program selection to start the new program.
4. Scroll through system settings using the SET UP key, in a similar manner as in "Secret Set Up". Adjust settings to your requirements. Refer to the program you have selected and its relevant flow diagram to check on settings. Set ambient RH (only in Prog. 5), set curing time (Prog. 5).
 - a) Set Crop High:- this represents the highest temperature acceptable within the crop, once high is reached the console will initiate a cooling sequence.
 - b) Set Crop Low:- Once cooling is initiated the console will attempt to bring the crop down to this low temperature setting.

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Note:- Crop High and Low settings will allow crop temperature to fluctuate between these two levels.

Set Duct - this sets the target temp in the duct during air mixing programs (Prog. 2, 3, 4).

- c) Set Differential:- With this setting the console will check ambient air temperature against crop temperature and only allow cooling to run if ambient air is cooler than crop by the set amount, eg Program 2, Stage 4.
- d) Set Frost:- This is a safety check of duct temperature, if ventilating air falls below this value the system will shut down for 1 hour and then re-start, eg Program 2, Stage 9.

Set Crop High 2, if the crop temperature exceeds this setting the fridge will be used if off peak is available (Prog. 4, 6).

Set Crop High 3, if the crop temperature exceeds this setting the fridge will be used outside off peak set times. Only in Prog. 4.

- e) Re-set Fan Run Hours:- Reset the hours reading logged by the console by pressing + and - keys simultaneously.
- f) Set Print Time:- If printer is not fitted ignore this, all setting should be ZERO. Time: Adjust this to read the time at which you wish printing to start. Interval: If is set to 12:00 (12 hours) then printing will take place twice per day. The display shows when the next print will occur.
- g) Re-circ. Time:- Setting in minutes, it is the time the fan will run during the ventilation re-circulation period.
- h) Recirc. Period:- This is in hours and sets the time between re-circulation.
- i) Crop Exclusion:- Use as a safety setting, the console will automatically ignore any crop sensor that becomes defective and reads higher than set crop high or lower than set crop low by the set value, eg set crop high is at 10°C, set crop low is at 9.5°C, crop exclusion is set to 1°C. Any crop sensor now reading more than 11°C or less than 8.5°C will be ignored. These values are shown on the display as HIGH and LOW. Recommended settings once crop temperature has stabilised are between 5 and 8°C but this will depend

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upon your requirement for the crop. Setting should be greater at initial stage of cooling.

If in doubt consult your supplier or adviser.

5. The controller is now ready for use, switch on ventilation system control gear.
6. As the console works through the flow diagram relevant to your PROGRAM selection use the CHECK key to follow its progress on the display.
7. Use the SENSOR key to select and de-select crop sensors. It is useful when controlling a partially filled store, for example. When the sensor list is displayed use + and - keys to select sensor and ENTER to select/de-select.
8. REMEMBER - use the HELP key to find information on various aspects of the console and to get textual assistance without the need of a paper manual.

It is good practice to check sensor readings and console settings on a regular basis.

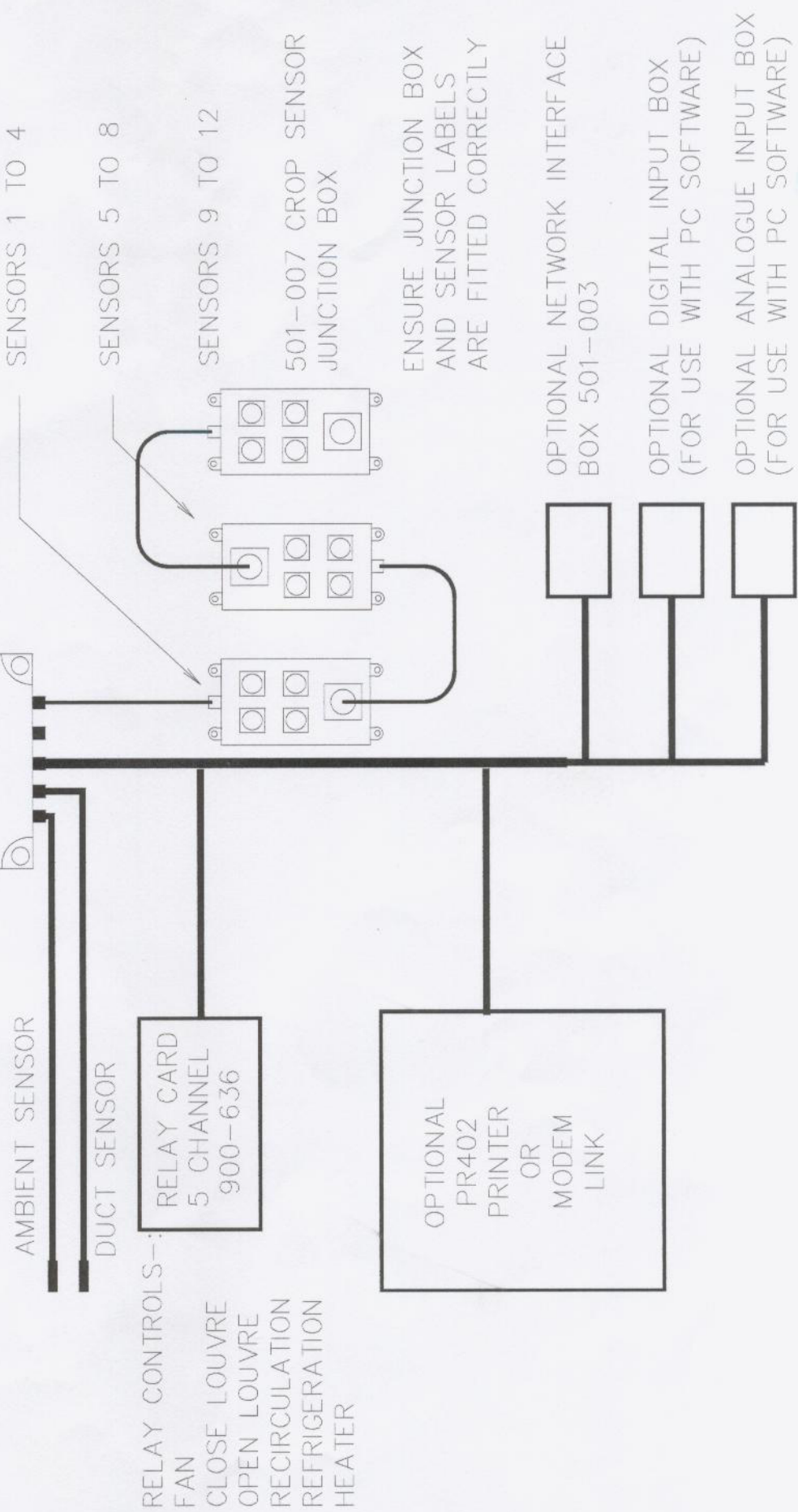
During the working life of the system, sensors need to be checked for accuracy whilst wiring and associated equipment needs to be checked for damage. Consult your supplier if in doubt.

TC322/12 SYSTEM

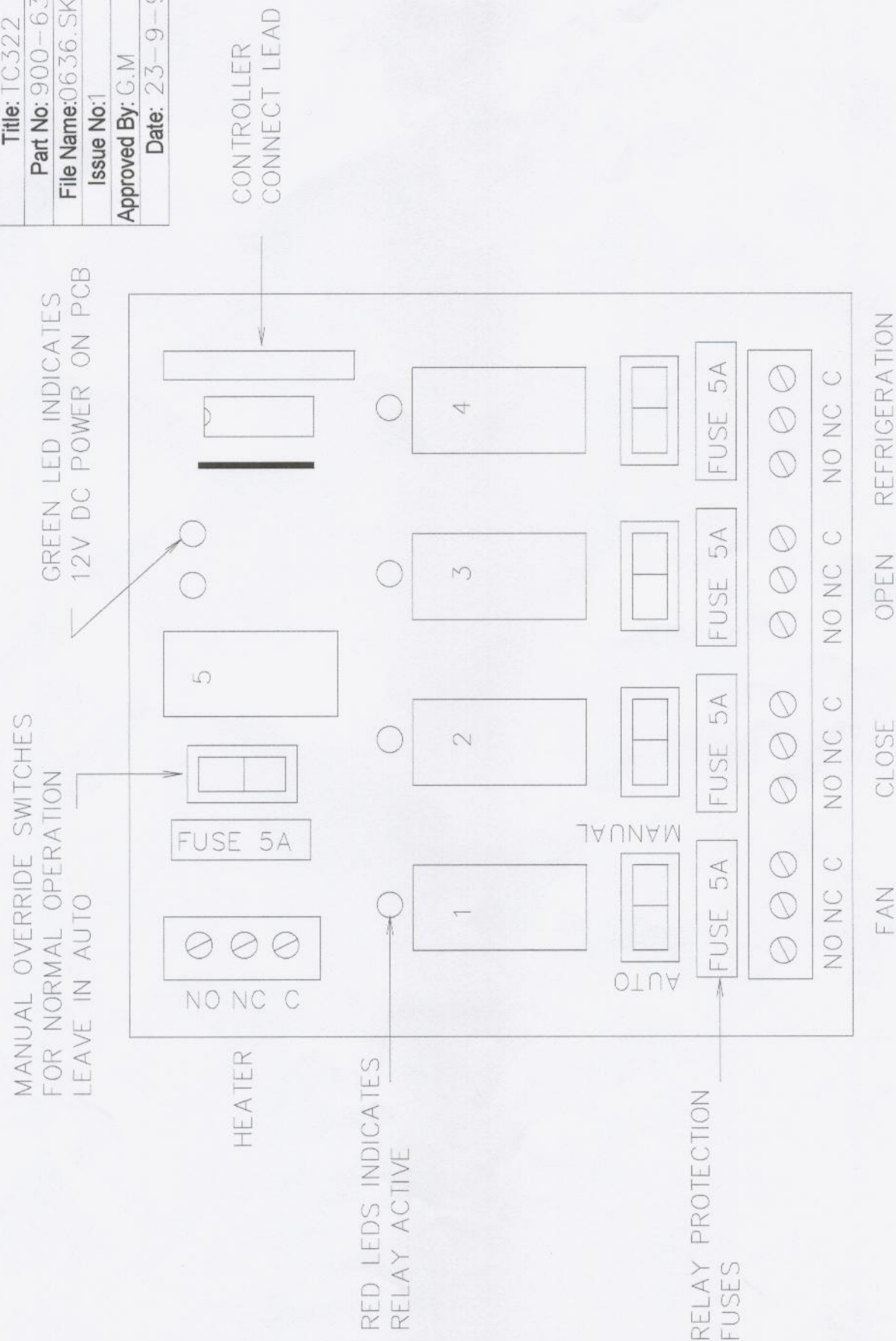
ROBYDOME LTD Woodhall Business Park Sudbury SUFFOLK CO10 6WH	
Tel: +44 (0) 1787 310163 Fax: +44 (0) 1787 880631	
Title: TC322/12 SYSTEM	
Part No: TC322	
File Name: TC322SYS.SKD	
Issue No: 2	
Approved By: G.M	
Date: 11-08-99	

501-141 (UP TO 12 SENSORS)
 501-142 (UP TO 24 SENSORS)

NOTE THIS DIAGRAM SHOWS A 12 CROP SENSOR SYSTEM, SMALLER SYSTEMS HAVE 1 OR 2 SENSORS J.B., LARGER SYSTEMS HAVE UP TO 6 J.B. FOR 24 SENSORS.

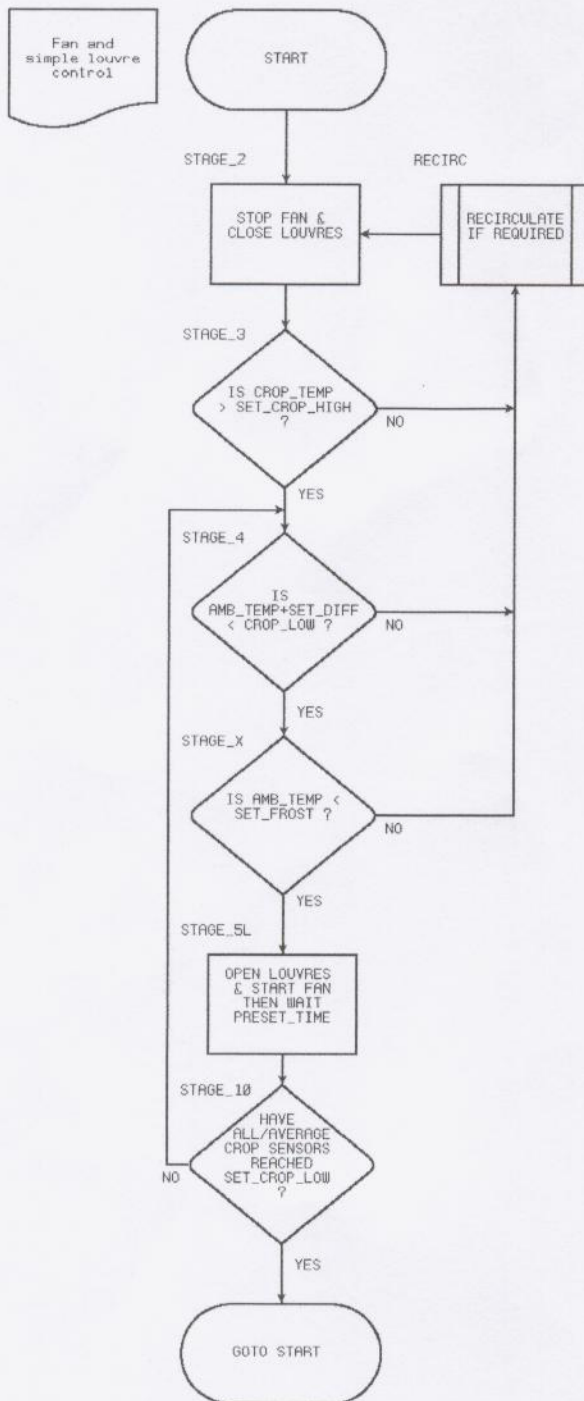


ROBYDOME LTD Woodhall Business Park Sudbury SUFFOLK CO10 6WH Tel: +44 (0) 1787 310163 Fax: +44 (0) 1787 880631	
Title: TC322 RELAY CARD	
Part No: 900-636	
File Name: 0636.SKD	
Issue No: 1	
Approved By: G.M	
Date: 23-9-96	



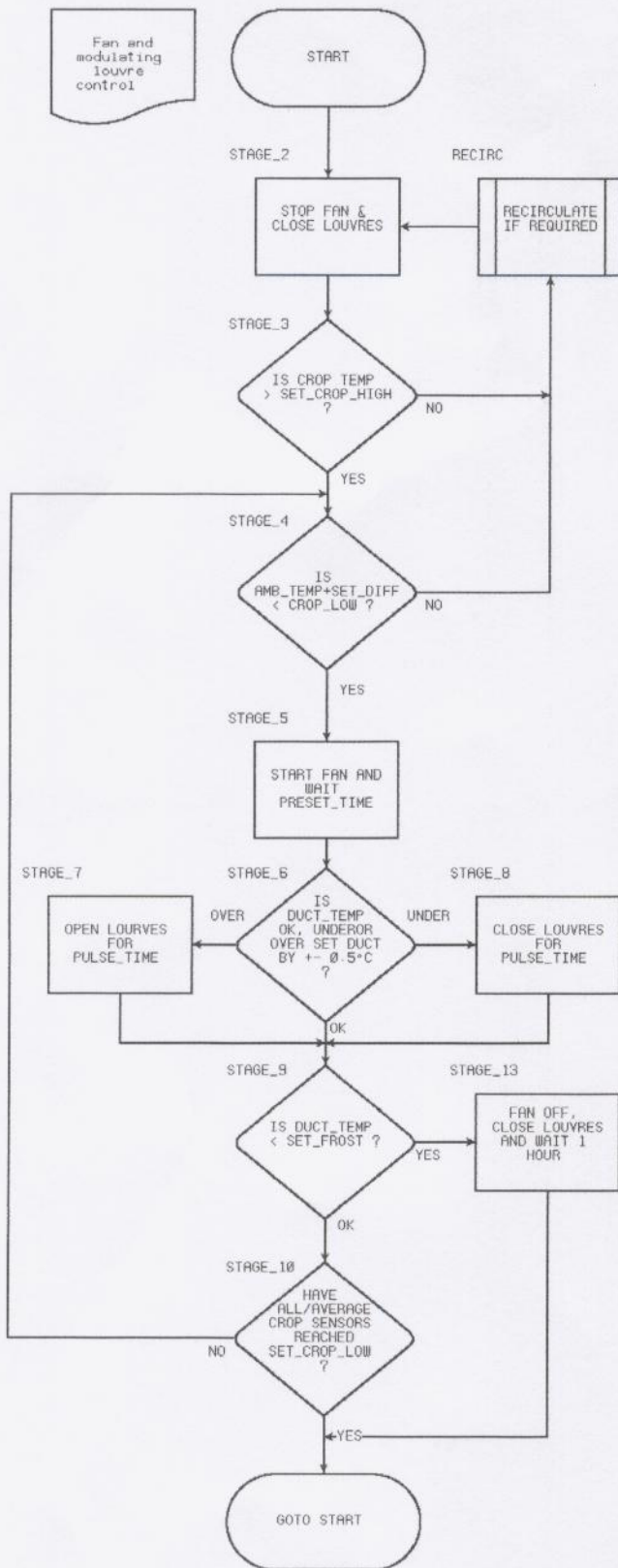
Program 1

TC322 6001 01/05/96



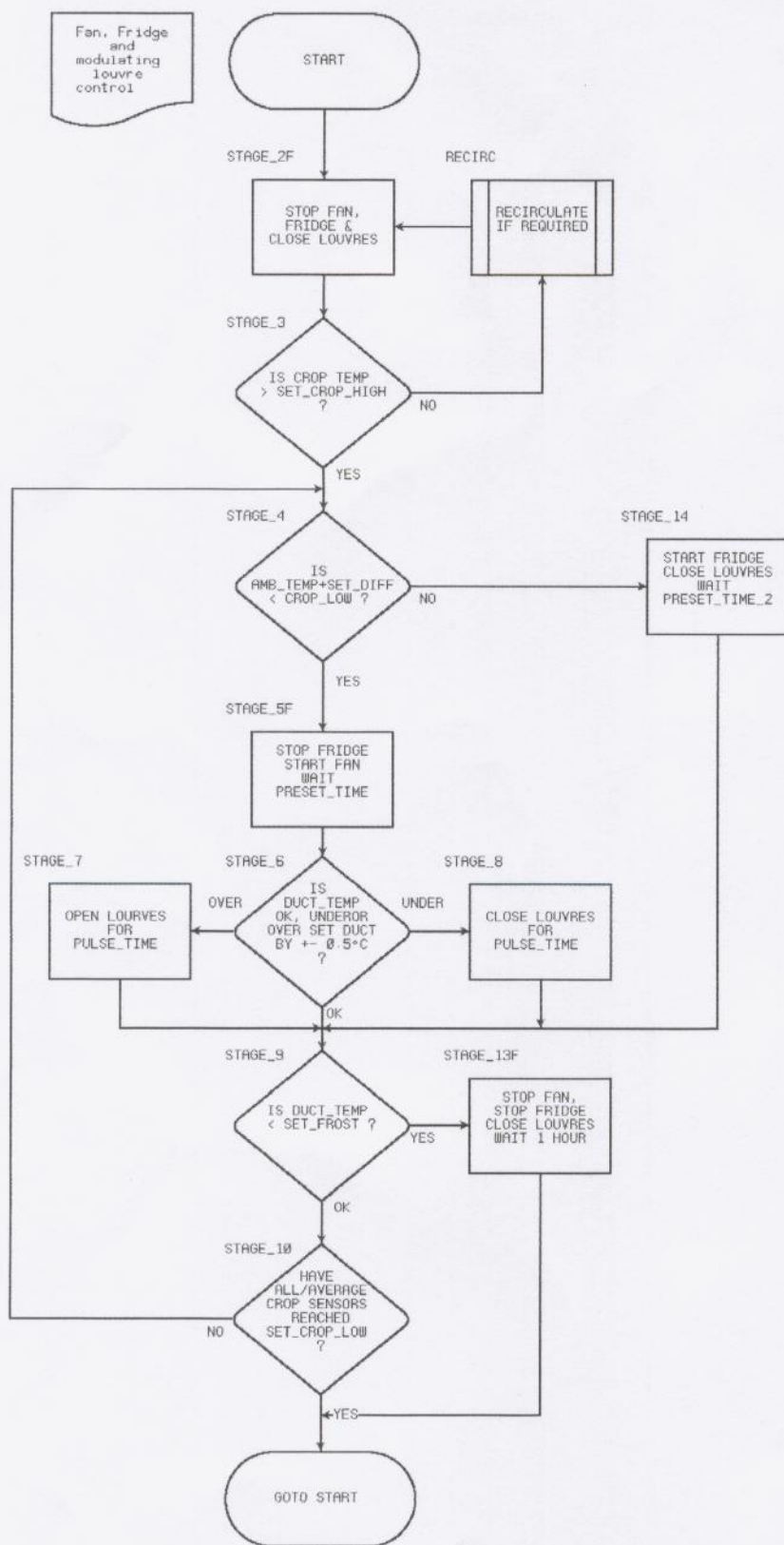
Program 2

TC322 6002 01/05/96



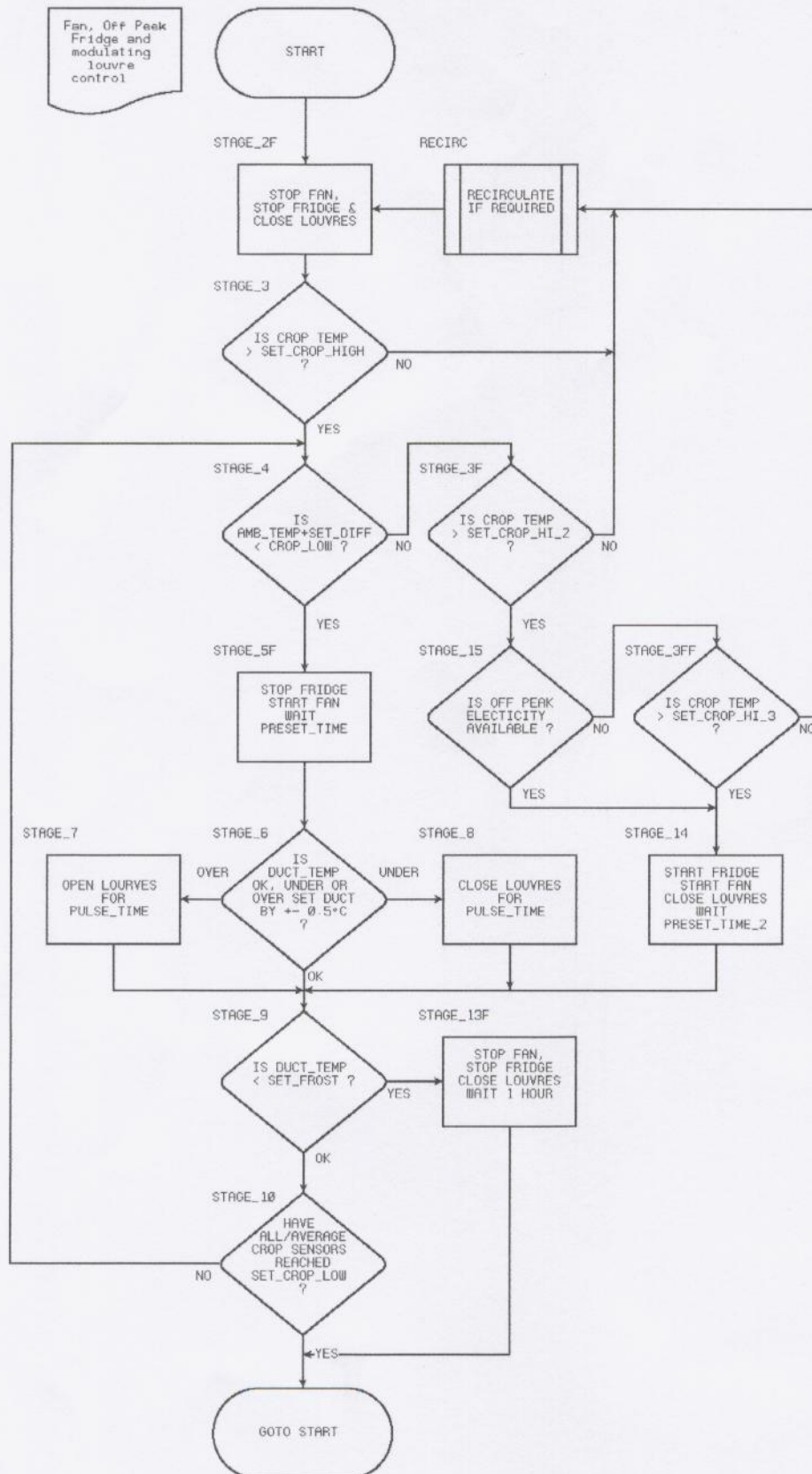
Program 3

TC322 6003 02/05/96



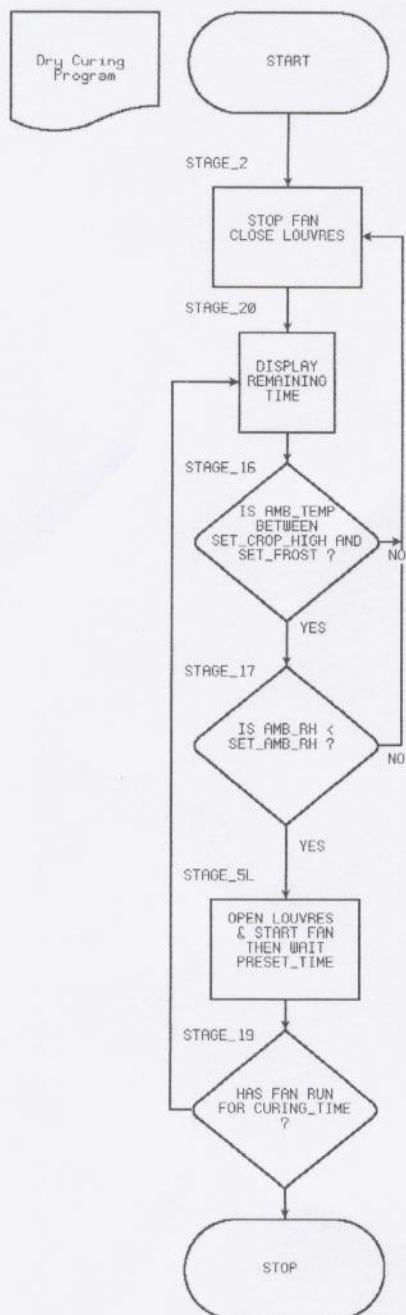
Program 4

TC322 6004 02/05/96



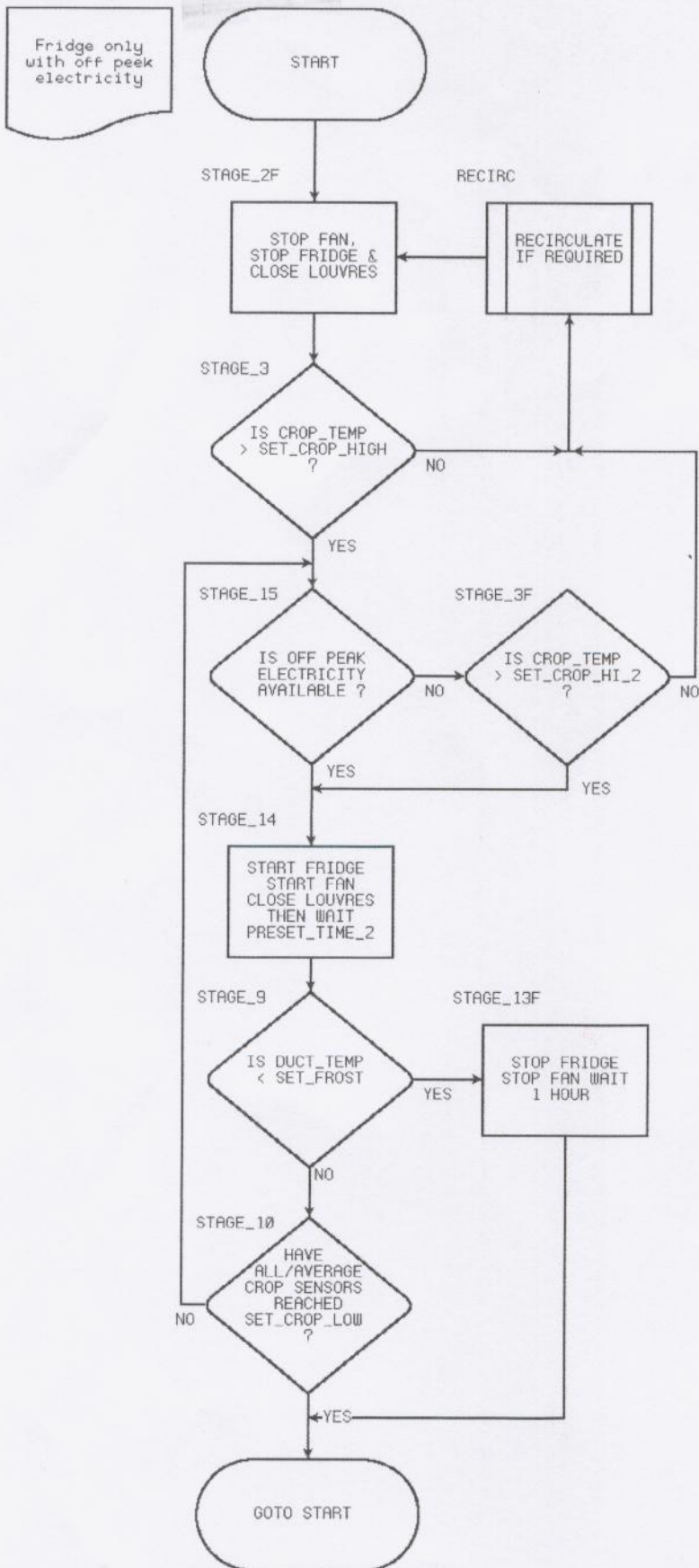
Program 5

TC322 6005 02/05/96



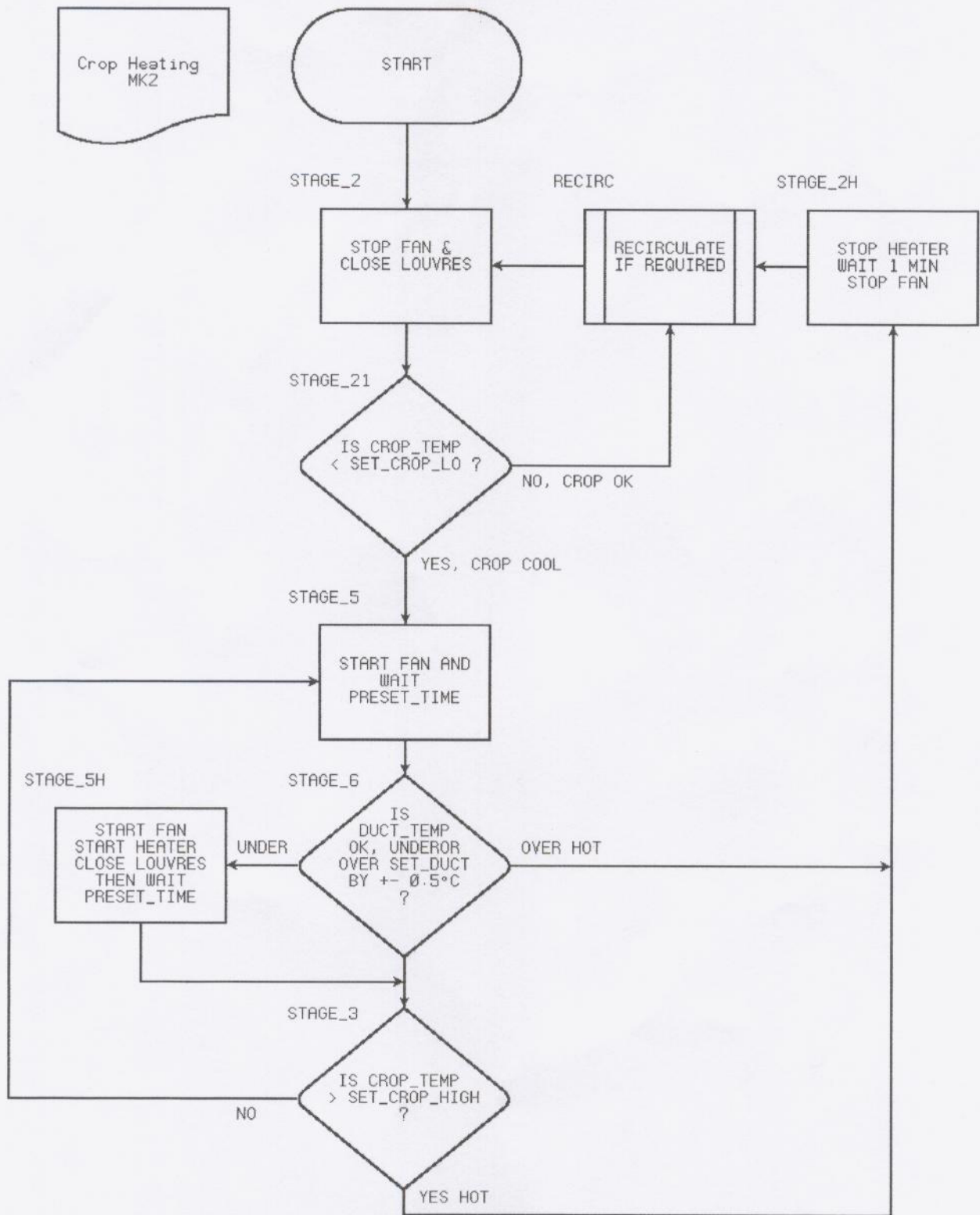
Program 6

TC322 6006 02/05/96



Program 7

TC322 6016-02 20/09/02



Program 8

TC322 6014 23/10/99

