TEA XP606M Transplanter Operators Manual

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CHAPTER 1

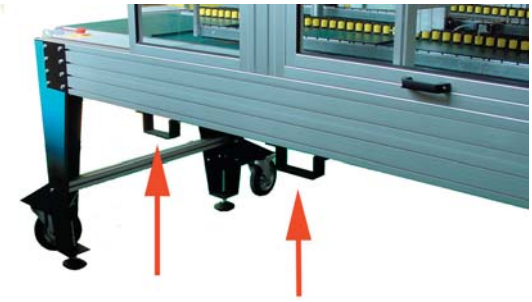
DIMENSIONS

HEIGHT	1.795 mm
WIDTH	1.500 mm
LENGTH	2.330 mm + 590 mm
WEIGHT	KG. 400
VOLTAGE	220V / 110V (Region Specific)
POWER	16 A
AIR PRESSURE	6 BAR
NOISE LEVEL	less than 70 DECIBEL

CHAPTER 2

TRANSPORT

- During transit the transplanter must be fixed onto a level surface and subsequently fastened to avoid vibration damage.
- It's a good rule to tie moveable elements to avoid vibration and impact during transportation.
- Place a piece of polystyrene or sponge under the head's trolley to avoid contact with the machine surface.
- Check carefully at the time of delivery that the machine is undamaged.
- To move the transplanter on level surfaces lift up the four anti-vibration feet and use the four swivel wheels
- It's recommended to use a fork lift when loading and unloading the transplanter, taking great care to keep the feet of the machine level. Put the forks in the brackets provided.
- Before switching on the machine, remove the clamps restraining the movement of the axes.



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CHAPTER 3

INSTALLATION

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Before starting the machine check the following:

Removal of packaging

Carefully remove all packaging and the ties that are restraining the movement of the axes.
Move all elements manually to check their smoothness.

Location of the machine

The machine must be placed indoors in a safe and sheltered place, on a level surface. Once positioned one should adjust the four anti-vibration feet so that they are completely level on the floor. Check that the machine surface is perfectly horizontal. The floor should be as clean as possible, free from grease, dust and soil.

Electrical supply

Depending upon which country the machine is sold to, the transplanter should be connected to an electrical supply of 240V or 110V.
Before connecting the machine check the tag close to the power point, which indicates the correct voltage. The power consumption is calculated as 1 Kw.
The electrical wiring needs 16A and earth connection. The electrical system must be installed and protected in accordance with current standards.
The client needs to arrange for sufficient protection of the power supply line through protection devices determined by current regulations.

Pneumatic supply

The machine requires an air supply to be connected to the inlet adapter located on the side of the electrical panel, close to the right front wheel. The inlet is fitted with an anti-condensation filter. Levels should be checked periodically. The emptying of the anti-condensation filter occurs when removing the air pressure from the system. It is however possible to manually empty the bowl by operating a push button on the underside.
The minimum pressure required is 6 bars. To adjust the required pressure, operate on the knob above the pressure gauge.

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CHAPTER 4

SAFETY NOTES & PRECAUTIONS

4.1 GENERAL SAFETY

- For correct and safe use please read all instructions before use.
- Install and set up the machine as directed in this manual.
- Do not remove the safety guards from moving parts.
- Put back the safety guards on moving parts before restarting the machine, and ensure that these are in place before starting the machine.
- Be careful not to catch any loose clothing in moving parts.
- Electrical servicing should only be undertaken by specialist personnel.

Before switching on the machine ensure that the side panels, plastic safety guards and the doors are all closed and secure. The manufacturer or their agent cannot be responsible for the occurrence of any fault or accident if these safety precautions are not followed or the safety guards are insecure or have been tampered with.

It is furthermore recommended to carefully read the chapter regarding the use of the machine and to proceed in accordance with these instructions.

Make sure that the earth conductor is connected.

Make sure that there are no objects which can obstruct, damage or stop moving parts.

Make sure that there are no untrained personnel or children near the machine when starting up.

4.2 OPERATOR SAFETY

For the safety of the operator it is essential to know the machine and all its components well. To avoid inaccurate or dangerous use of the machine, proper training will be required.

Under no circumstances should an operator attempt to alter or adjust any of the operating components while the machine is working.

The machine is equipped with FIXED safety guards protecting moving parts. These are fastened to the structure and can only be loosened by use of a tool.
Only remove the safety guards after disconnecting the system from any type of energy source.

The machine is also equipped with safety guards, which can be opened. These are provided with security switches, which stops the moving parts when the guards are opened.

Only remove material from inside the machine after disconnecting the system from all energy sources.

For electrical protection, the user must make sure the machine is earthed and connected to an appropriate power supply with an automatic earth leakage circuit breaker.

Check that there is electrical continuity between metallic parts and that these are earthed to avoid accumulation of static electricity, which can be annoying for persons touching the metallic parts or cause sparks with the subsequent danger of igniting inflammable material.

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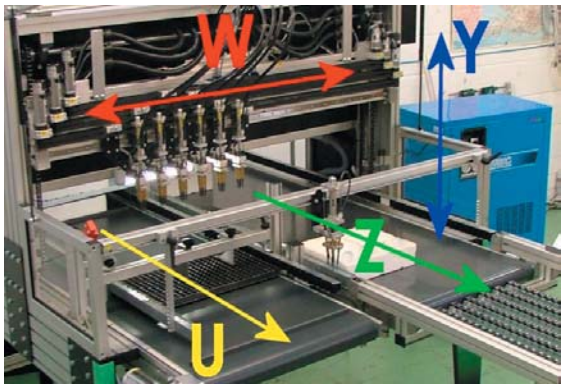
MACHINE COMPONENTS

CHAPTER 5

5.1 Controlled Axes

The integral computer controls the movement of each axis in sequence to perform the transplanting operation.
Each axis is named alphabetically or alphanumerically to identify each axis. The axes present on the machines of the X600M series are as follows:



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Axis Y This is the movement of the trolley, from the upper position to the lower position and vice versa. The movement allows picking up plants from one tray and placing them in another. The movement is made by a 48V direct current motor.

Axis U This is the path normally situated on the left side of the machine. It is formed by a belt, complete with sliding wheels or a series of sliding wheels fixed to a chain. The young plant trays slide between these. The movement is made by a 48V direct current motor. The track moves forwards towards the operator.

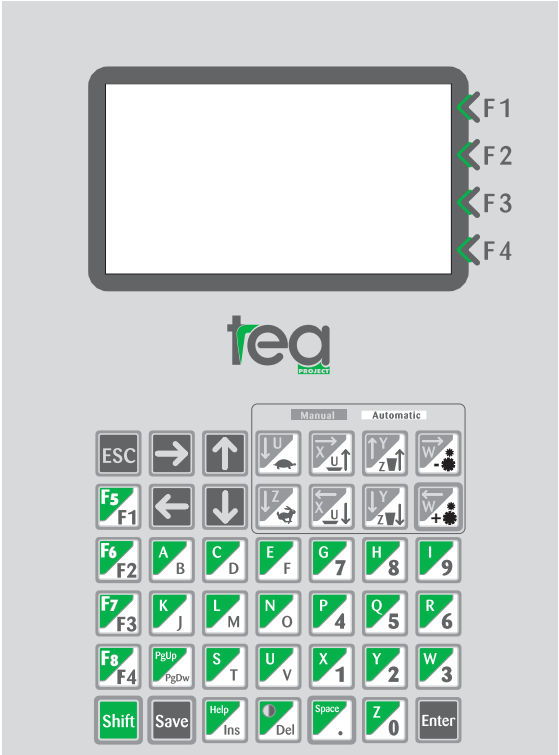
Axis Z This is the path where the trays or pots, containing the transplanted plants, move. This path can be a conveyor belt run by a 48v direct current motor. The conveyor moves forwards towards the operator.
In other cases this path is represented by a transport system for pots or trays on a pot filling machine.

Axis W1 This is head no. 1 complete with 24v direct current motor. The head moves linearly, on a guide from left to right and vice versa.

Axis W2, W3, W4 etc. These are heads no. 2, no. 3, no. 4, etc. complete with 24v direct current motor. The heads all run linearly on the same guide from left to right and vice versa. The number of heads on the machine depends on the model.

5.2 Control Panel

The electrical control panel is normally positioned laterally, integrated in the protective framing of the machine.
All commands necessary for the functioning and programming of the machine are situated on the control panel.
Avoid getting water on the keyboard and the push buttons, and protect it from blunt instruments and naked flames. Clean with a soft damp cloth, do not use detergents or chemical products.



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5.3 Emergency buttons

Red emergency buttons on a yellow background are located on the external panels and on the additional keyboard. The machine can be stopped by the operator at any time by pushing one of these buttons, should people or objects be in danger.
As long as the push button remains pushed in, all other commands are deactivated and it is not possible to restart the machine from any other point.
When the emergency button is pulled back out the machine can be restarted by reactivating the Auxiliary On/Reset button and pressing the “START” button.

5.4 Safety guard

Clear plastic safety guards for the machine are provided with one or more doors, which can be opened by lifting them upwards. Opening these doors whilst the machine is operating will suspend all its functions. These can only be restored through the control panel when the door is closed, following the same procedure as with the emergency buttons. The safety guards and security switches must not be tampered with.

5.5 The electrical panel

The electrical panel is integrated in the structure of the machine and is suitably labelled.
In case of servicing pay attention to the instructions on the electrial scheme and use only qualified personnel.
Do no attempt to make alterations or adjustments inside the control cabinet, unless specifically instructed to do so by your authorised TEA dealer.

5.6 U Axis micro switch

A micro switch is positioned close to the guide on the right hand side of the plug tray path. This signals the presence of a tray to the computer.
To clear trays from this area, see the procedure in the following chapters.
Avoid manually removing trays as this risks damage to the micro switch.

5.7 Z Axis Micro switch or Photocell

A micro switch (a photocell in some models) is situated close to the left guide of the right hand path where the conveyor belt is running. This switch signals the presence of trays or pots to the electronic control. To clear trays situated in the work area of the heads or close to the micro switch/ photocell, see the procedure in the following chapters. Avoid removing trays manually.
In the case of models operating directly on a filler, the micro switch is used to syncronize the two machines.

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5.8 Motorized Heads

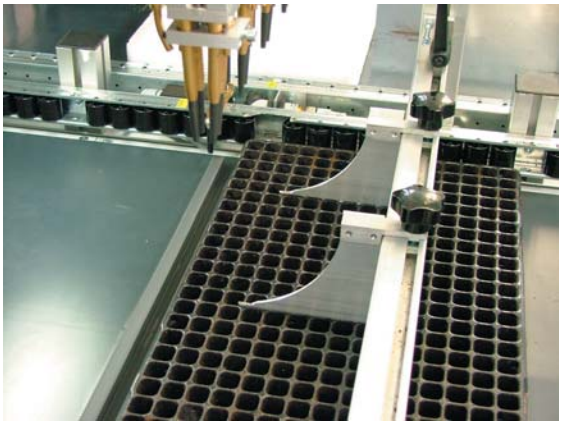
The combination of the elements picking up the plant is called a “HEAD”.
Each head consists of 4 needle-holder extractors with 4 steel caps, 4 needles and a pneumatic cylinder which ejects and retracts the needles.
Each head is fixed to an electric motor which controls their positioning.
There are different types of heads with different dimensions and functions.
The pick-up of the plant is always made from the top, with minimal damage to the foliage as it picks up the plug directly.

5.9 “U” and “Z” Axis Guides

The guides control the passage of the trays on the belt or roller transport.
They are always present on the “U” axis.
They might not be present on the “Z” axis.
The correct adjustment of these guides, especially on the “U” axis is important for a good transplanting result.
Carefully adjust the guides every time a new tray is used.

5.10 Tray restraint - “U” axis

The restraints on the “U” axis prevents the trays from moving during the phase where the plants are extracted.
The guides have to be tight to the trays, above all when handling plants with strong roots, to avoid the trays being lifted when the heads are extracted whilst picking up a plant.
The restraints should be positioned as close as possible to the trays and they should not hinder the movement of the heads. Use an empty tray during the adjustment of the guides to make this positioning easier.



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CHAPTER 6

CONTROL BUTTONS

You will find a series of control buttons, manual switches, and lights marked with yellow labels, in addition to a computer with an alphanumeric keyboard, named TL2 positioned on the outside of the machine.
A brief description of the functions of the control buttons and switches follows below.
However, in the following chapters the precise function of all the commands will be thoroughly described.

6.1 Buttons lights and switches

Red ON-OFF switch
Positioned on the control panel of the machine near the computer.
Turns the machine on and off.

POWER ON Light
Signals the presence of power

Green button/light "AUXILIARY ON/RESET"
It is necessary to press this button every time you start the machine and every time you want to exit an emergency condition.

Red EMERGENCY light
Signals the arrest of the machine caused by an emergency situation. The light switches off when the condition causing the emergency is removed and the "AUXILIARY ON/RESET" button is pressed.

Selector switch for lighting the machine
To turn the internal lights of the machine on and off.

Green START button
used when starting a run cycle or restarting a cycle which has been interrupted by an emergency situation

Red STOP button
used when interrupting (pausing) a cycle or completely stopping a run cycle (press and HOLD).

Red Emergency Switches
These have the classic "mushroom" shape.
The operator can isolate the machine, if people or objects are in danger, at any time by pushing one of these buttons.

6.2 Additional Keyboard

An additional mobile keyboard is available. It has the following buttons:
Red STOP button (will only pause cycle)
Green START button
Green"AUXILIARY ON/RESET" button/light
Red emergency switch

6.3 Keyboard TL2 computer

Alphanumeric keyboard
for entering data into the computer
The green/white keys contain numbers and letters.
Pressing the key makes the computer enters the character shown on the white background. Holding down the green "Shift" key, makes the computer enter the character shown on the green background.
for example:
to enter "4" press the 4 key
to enter the letter "P" press the same key whilst holding in the "Shift" key.

Black ESC key
Normally used to exit an entry or menu screen and return to the previous screen.
Return to last step.

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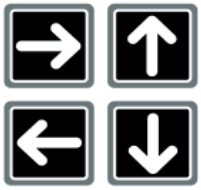
Black Save key
Normally used to memorize a programme which has just been written.

Black Enter key
Normally used to confirm the latest information entry or to pass from one line to the next.

Black Arrow keys (right, left, up, down) Normally used to move the cursor in the four directions on the display



"Function" keys (F1, F2, F3, F4)
Used individually they give access to the functions shown on the computer screen, particularly the functions F1, F2, F3 & F4. The functions are often connected to the MENU displayed in the screen.

"Function" keys (F5, F6, F7, F8)
Used whilst pressing the green "Shift" key, to access to the functions described on the screen, particularly the functions F5, F6, F7 & F8.

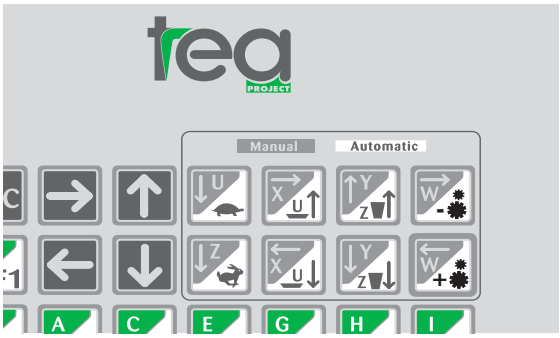
PgUp / PgDw key
Used to move to the next page when pressed by itself. Used to go to the previous page when pressed in combination with the green "Shift" key.

Help / Ins key
Inserts characters when used by itself.
Used to enter on-line help when pressed in combination with the green "Shift" key.

Bright-Dark / Del key
Used to cancel characters shown on the display when used by itself. Used to change the brightness of the display when used in combination with the green "Shift" key.

Space / Dot key
Used to insert a decimal point on the display when used by itself. Used to insert a space on the display when used with the green "Shift" key.

MANUAL/ AUTOMATIC keys
In the upper right corner of the keyboard there are 8 keys in a grey and white square.
These are used for specific actions during the run cycle of the machine.
The keys have two different functions, depending on when they are used.
If the machine is executing a transplacing cycle (Automatic menu) the symbols in black on white background are effective.
If, on the other hand, the machine's axes are being moved manually (Manual menu or learning cycle) the grey symbols are effective.



AUTOMATIC - 8 KEYS ON WHITE BACGROUND

1) TURTLE

Reduces the run speed of the machine

2) HARE

Increases the run speed of the machine

3) U + ARROW UP
Raises the pick up depth of the heads when picking up plants. Used with the "Shift key" to prevent damage.

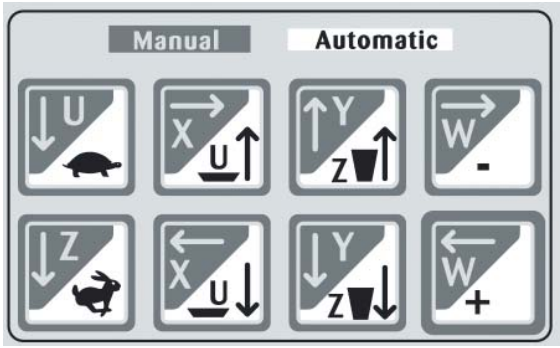
4) U + ARROW DOWN
Lowers the depth of the heads when picking up plants. Used with the "Shift" key to prevent damage.

5) Z + ARROW UP
Raises the planting depth of the heads in the transplanting cycle. (the plants will be planted shallower). Used with the "Shift" key to prevent damage.

6) Z + ARROW DOWN
Lowers the planting depth of the heads in the transplanting cycle (the plants will be planted deeper). Used with the "Shift" key to prevent damage.

7) GEAR-WHEEL WITH "-"

8) GEAR-WHEEL WITH "+"



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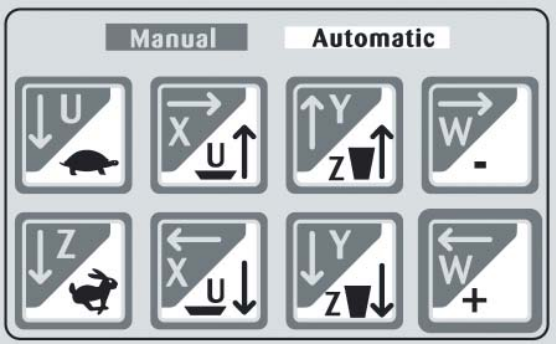
Manual - 8 keys on grey background

1) U + Arrow down
   Advances the pick up trays
2) Z + Arrow down
   Advances the placing trays or pots
3) X + Arrow to the right
   Moves the trolley from left to right
4) X + Arrow to the left
   Moves the trolley from right to left
5) Y + Arrow up
   Raises the trolley
6) Y + Arrow down
   Lowers the trolley
7) W + Arrow to the right
   Moves the heads towards the right
8) W + Arrow to the left
   Moves the heads towards the left



6.4 Serial Port

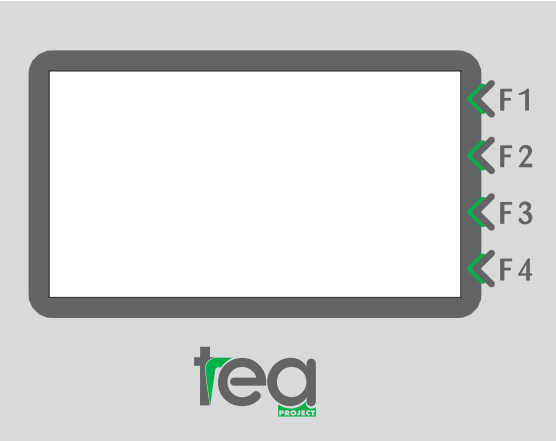
The RS232 serial port positioned on the back of the TL2 computer allows connection to a PC for exchange of data.

6.5 Floppy Disk

Used to update the software of the machine and to make back-up copies.

6.5 Display

Monochromatic backlit display with 420 semigraphic characters.



On the right side of the display the functions of the “F1, F2, F3 & F4” keys appear, according to the selected menu.
On all the display screens the last line of the display shows EMERGENCY messages or the state of the machine.

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CHAPTER 7

Startup Procedure

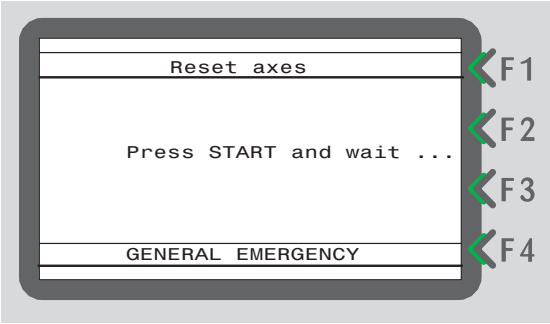
7.1 Before switching on

Before switching on the machine check the following:

a) Check that the machine is connected to correct voltage.
b) Air pressure 8 bar.
c) The working area is cleared, ready for use.
d) The safety guards are correctly secured.
e) The emergency buttons are not pushed down. If they are, reset them.

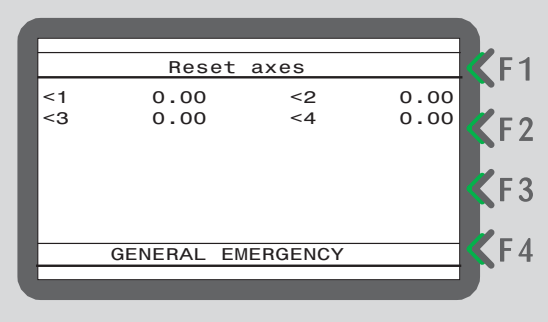
7.2 Starting the Transplanter

After connecting the Transplanter to the power source and the compressed air system, start the machine by rotating the red switch on the control panel.
The white 'Power On' and the red 'Emergency' lights will then be illuminated.
Push the green "Auxiliary On / Reset" button which will illuminate and the red "Emergency" light will turn off.
At the same time the display will illuminate, and after displaying the program version for a couple of seconds the following will be shown in the display: (Note that it may take a while for the display to reach full brightness)

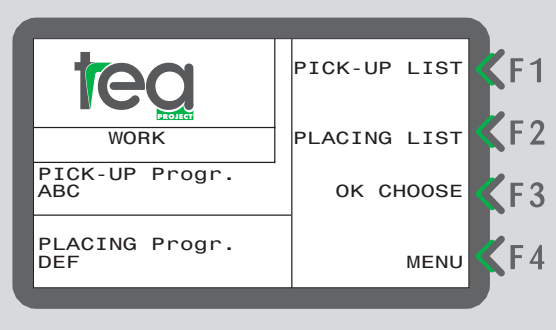


The upper part of the display will normally display the current status of the machine. In this case the display tells us that the machine is waiting to reset the axes.
The central part of the display will show the instructions awaiting action. In this case the computer tells us to press the START button to start working, and wait for further instructions.
In the lower part of the display possible error messages will appear. In this case the computer signals a general state of emergency. This message disappears as soon as you push the "Auxiliary On / Reset" button.

When the "START" button is presses the machine moves all axes to their start positions and the following is shown in the display:



This screen enables technicians to find the correct position of the encoders on the motors.
Push "ESC" and the following screen will appear.



7.3 On-line help

If, during use of the computer, you find yourself in doubt about a situation, it is always possible to activate the context sensitive on-line help.
Push the "HELP" key and a note, related to the current display will appear on the screen.
Remember that to activate instructions or characters written on the green part of the key, you need to simultaneously push the green "Shift" key.
After the on-line help screen appears , pressing any key will terminate this function.
ex.
If pressing "HELP" when on the previous screen, the following help screen will appear.

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CHAPTER 8

Programme

8.1 Definition of “Programme”

A programme is a sequence of instructions to position the heads either in the tray where the plants are picked up, or in the tray/pot where the plants are being transplanted.

The set of instructions related to picking up the plants is called : PICK-UP PROGRAMME

The set of instructions related to the deposit of the plants is called : PLACING PROGRAMME

The PICK-UP and PLACING programmes are clearly distinct and separate from each other.

Carrying out a transplant operation means combining a PICK-UP programme and a PLACING programme.
The combination of the two programmes is automatically done by the machine.

The Transplanter carries out the two programs simultaneously: When it is picking up a plant it carries out the instructions written in the PICK-UP programme; when it is depositing a plant, it carries out the instructions written in the PLACING programme.

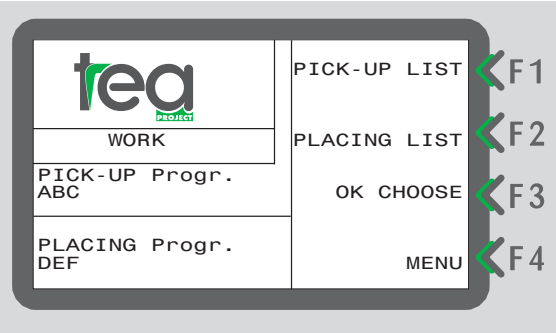
8.2 Stored Programmes

The programmes are written directly on the keyboard of the TL2 computer and memorized when given a name of maximum 8 characters.
It is possible to memorize 99 PICK-UP programmes and 99 PLACING programmes.
When one starts to work it is necessary to choose the appropriate PICK-UP and PLACING programmes; there is always the possibility of deleting programmes which are no longer in use and writing new ones.
The selection of which programmes to use is made through the display.

Some instruction on how to carry out, register and modify programmes follows here. Use the enclosed booklet to write down the identifying characteristics of every programme; it is worthwhile to periodically make a back-up copy of the programmes to avoid having to rewrite them in the unlikely event of failure of the computer.

8.3 Choice of programmes

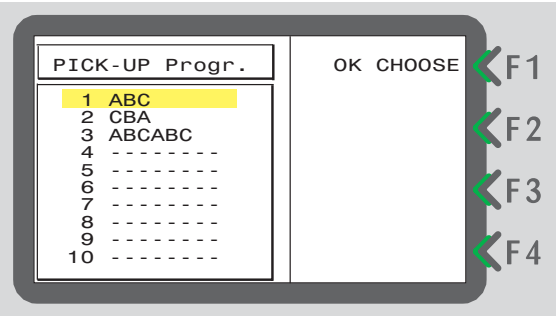
As seen in the previous chapter, the display will show the “RUN” screen when starting the machine.
Later you will also see that it is possible to reach this position from the main MENU.
On the right hand side of the display 4 entries appear:
F1: PICK-UP LIST (access to the pick-up programme list)
F2: PLACING LIST (access to the placing programme list)
F3: OK CHOOSE (Starts to run with the pick-up and placing programme shown on the left hand side of the display)
F4: MENU (access to the main menu)



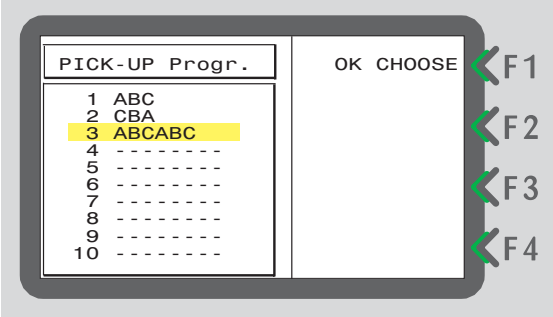
If the Pick-up programme and Placing programme shown to the left in the display are the ones you intend to use, it is possible to start the run cycle by pressing F3 (passing to the next section).

If you intend to choose a different pick-up or placing programme proceed as follows.

Press F1 to enter the complete list of PICK-UP programmes.
Scroll the programme list by using the “ARROW UP” key



or the “ARROW DOWN” key.
When the required programme is reached confirm with the F1 key.
Note that the selected programme is highlighted by reversed characters compared to the rest of the list.



Confirm the selection with the F1 key to return to the “RUN” menu.
Pressing the “ESC” key will return you to the “RUN” menu

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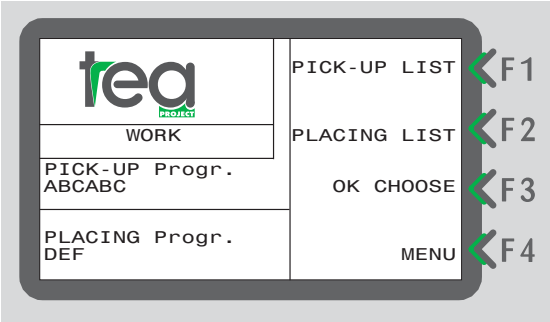
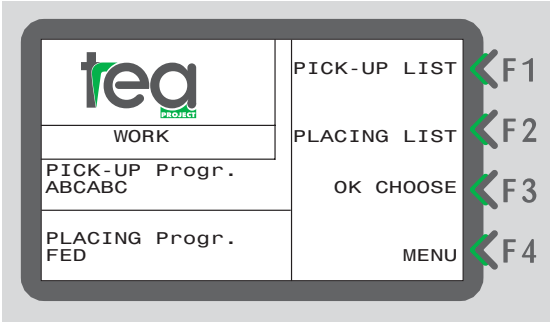
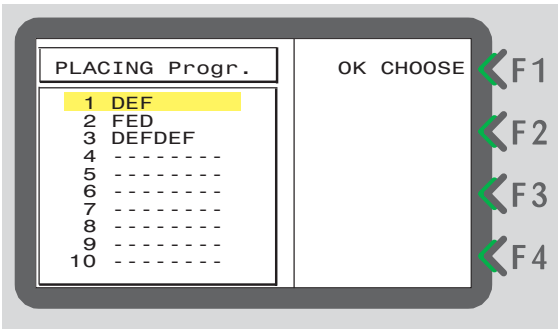




without selecting a new programme.
In the example shown we have chosen a pick-up programme called "ABCABC" .
On the left hand side the display therefore shows "PICK-UP Progr. "ABCABC".

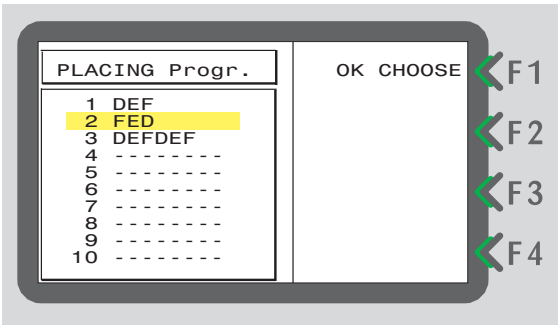
Press "F2" to enter the complete list of PLACING programmes.

Scroll the programme list by using the "ARROW UP" key



or the "ARROW DOWN" key.
When the required programme is reached confirm with the F1 key.
Note that the selected programme is highlighted by reversed characters compared to the rest of the list.

Confirm with F1 to carry out the selection and return to the



"RUN" menu.
Pressing the "ESC" key will return you to the "RUN" menu without selecting a new programme.

In the example shown we have chosen a placing programme called "FED".
On the left hand side the display therefore shows "PLACING Prog."FED".

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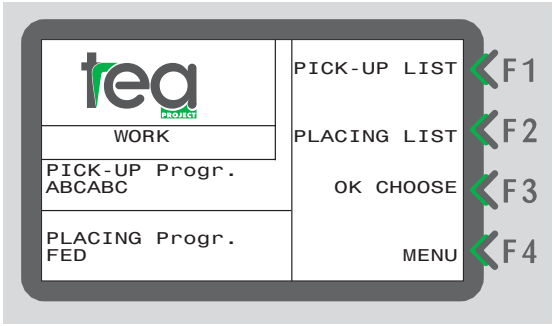
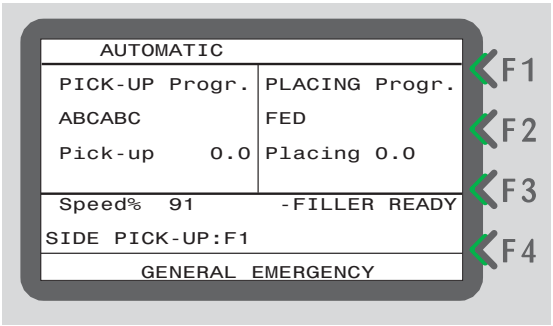
CHAPTER 9

Automatic cycle

9.1 Access to AUTOMATIC CYCLE



Press the F3 key to enter the following screen.



The machine is ready to start a transplanting cycle.

9.2 Display and active buttons in AUTO MATIC cycle

DISPLAY

"AUTOMATIC" displayed in the upper part of the screen identifies the mode of operation.

BOX IN UPPER LEFT HAND CORNER.
"PICK-UP Prog." "ABCABC" identifies which pick-up programme in use; "Pick up nn,n" indicates the height at which the heads pick up the plants, this value is given in millimetres.

BOX IN UPPER RIGHT HAND CORNER.
"PLACING Prog." "FED" identifies which placing programme in use; "Placing nn,n" indicates the height at which the heads plant the plants, this value is given in millimetres.

Ex. If "Placing 12,5" is displayed, it means that the heads plant the plugs 12,5mm from the bottom of the tray/pot.

LARGE BOX IN LOWER PART OF THE DISPLAY.
"Speed % nn" speed at which the machine is working at the moment, shown as percentage from 1 (minimum speed) to 100 (maximum speed).

"ENABLE FILLER" If highlighted this enables independent use of the filler connected to the system as regards the transplanter. If the AUTOMATIC transplant cycle is highlighted, this function will be disabled.

"SIDE PICK-UP: F1" press the F1 key to activate the side-pickup feature. Press F1 again and the function will be disabled.
The side pick-up is active when the characters are higlighted in inverted text. (SIDE PICK-UP: F1).

Bottom display line.
This message will vary according to the state of the machine :

GENERAL EMERGENCY - the machine is at a standstill and will not start again until this message has been cleared. The stoppage might be caused by an open security door, or by the pressing of an emergency switch without pressing "AUXILIARY ON / RESET" afterwards.
message 2
message 3
ecc...

USABLE KEYS AND BUTTONS

Pay particular attention to the white/grey keys in the upper right-hand square within a black frame, described in chapter 6.
In the AUTOMATIC menu the keys with the symbols shown in black on a white background will be effective.
The symbols on the grey background are inactive in this mode.

1) TURTLE
Slows down the working speed of the machine. The key works when the machine is stationary as well as when it is moving.
2) HARE
Increases the working speed of the machine.
3) U + ARROW UP
Raises the pick up depth of the heads when picking up plants.
4) U + ARROW DOWN
Lowers the depth of the heads when picking up plants.
5) Z + ARROW UP
Raises the depth of the heads in the planting phase. (the plants will be planted shallower).

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6) Z + Arrow down

Lowers the depth of the heads in the planting phase (the plants will be planted deeper).

Keys 1-6 (above) will function both when the machine is stationary as well as during the transplanting cycle.

The function of keys number 7 and 8 can vary according to machine model and configuration.

7) Gear-wheel with "-"

If the transplanter is connected to a soil filler, pressing this key activates the "ENABLE FILLER" function for using the filler separatly, without the transplanter.

The key only works if AUTOMATIC cycle has not been started.

8) Gear-wheel with "+"

Enables the advancing of the belt or rollers of the "U" axis, to quickly position the pick-up trays close to the micro switch, or to remove these trays.

The key only works if AUTOMATIC cycle has not been started.

For further details see the manual appendix

F1 key

Enables the side pick-up function.

Green START button

Press the green START button and the machine will start an automatic transplanting cycle.

Red STOP button

Pressing the red STOP button will immediately stop the automatic transplanting cycle (pausing the cycle).

Keeping the button pressed for a few seconds will take you out of the automatic transplacing cycle.

9.3 Starting an Automatic cycle

Before starting an automatic cycle carry out the following procedures.

Carefully adjust the guides which control the passage of the trays on the belt between the guide roller wheels.

Adjust the tray restraints on the "U" axis.

Reduce the speed on the machine to 10-15%

Remove any used trays that might be present at the micro switch of the "U" axis by using the Gear-wheel with "+" key

Disactivate the "ENABLE FILLER " function if this is active, by using the Gear-wheel with "-" key.

Press the green "START" button and the machine will start the transplanting cycle.

After checking that the chosen programmes correspond with the trays you are using and that the programmes work correctly, you can increase the speed using the "HARE" key. To reduce the speed, use the "TURTLE" key.

To temporarily suspend the transplanting cycle, press the "STOP" button.

If you want to resume the transplanting cycle from where it was suspended, press the "START" button.

If you want to stop the transplanting cycle completely and exit the programme, keep the "STOP" button pressed for a few seconds.

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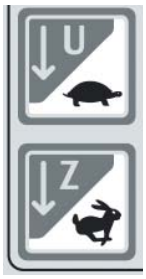
9.4 Adjustments during an Automatic cycle

Whilst the machine is operating, you can adjust the following:

Increase or reduce the speed



Increase and reduce the height with which to pick-up the plant (axis “U”). Used with the "Shift" key to prevent damage. Pay particular attention using these adjustments, taking small steps and overseeing the result step by step. Small variations can often optimise the pick-up.

Increase and reduce the height at which the plant is planted (axis “Z”). Used with the "Shift" key to prevent damage. In this case you should also make small corrections at a time, and check the result step by step.

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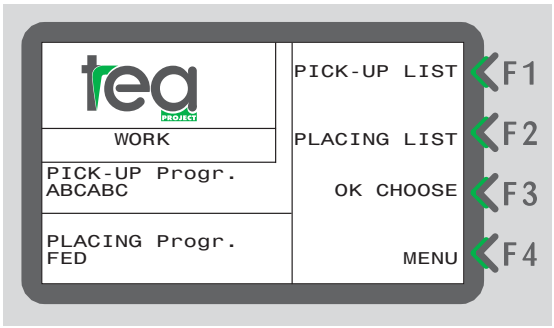
CHAPTER 10

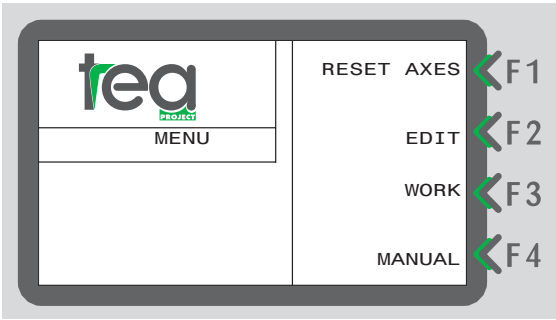
Using the TL2 computer

10.1 Main MENU

As described in the previous chapters, the machine will automatically go to the “RUN” menu when it is turned on. From this menu you can select previously written programmes and enter the “AUTOMATIC” transplanting cycle.

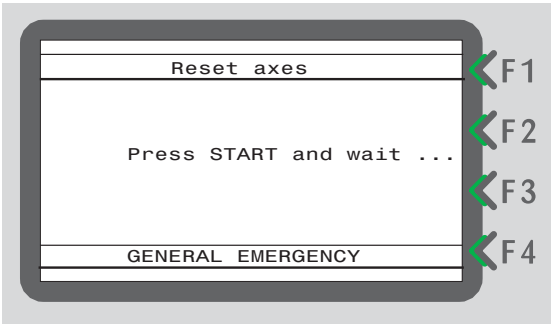


From this point it is also possible, through use of the “F4” key or the “ESC” key, to enter the main “MENU”. From the main “MENU” you have access to 4 functions:



10.2 F1 - ZEROING THE AXES

Useful function for resetting the machine without having to turn it off and on again. Normally this function is only required when general parameters on the machine are being changed. Such an operation is usually done by qualified personnel or after explicit instruction during maintenance. The zeroing axes sequence is described in chapter 7 “Starting the machine”.

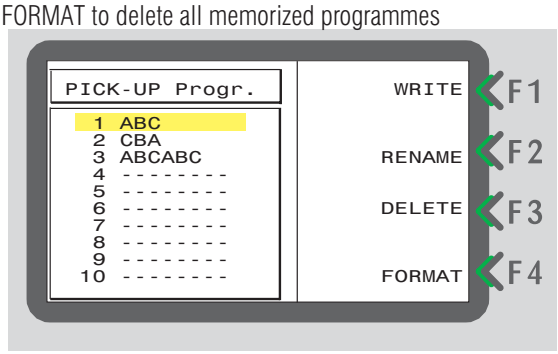


10.3 F2 - WRITE

This function gives access to writing, modifying or deleting programmes.
It has to be used every time a new programme is written.

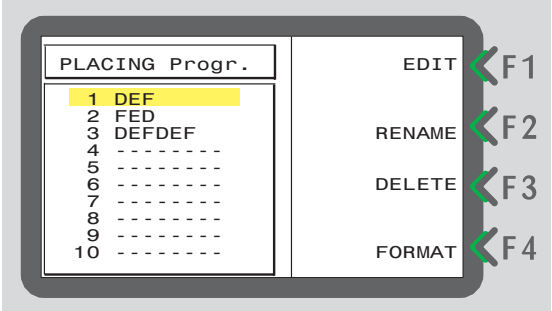
At this point the display gives the option to choose between the PICK-UP programmes and the PLACING programmes.

By choosing “PICK-UP” the display will show the list of “PICK-UP” programmes and 4 options:
WRITE to write a new programme
RENAME to change names of existing programmes
DELETE to delete one or more existing programmes
FORMAT to delete all memorized programmes



The last option is protected by a password, to avoid accidental erasure of all PICK-UP programmes.

By selecting “PLACING” the display will show the PLACING programmes list, and like the previous case, 4 options: WRITE, RENAME, DELETE and FORMAT.
Also in this case the last option is protected by a password, to avoid accidental erasure of all PLACING programmes.



10.4 F3 - RUN

Returns to the “RUN” menu described previously.

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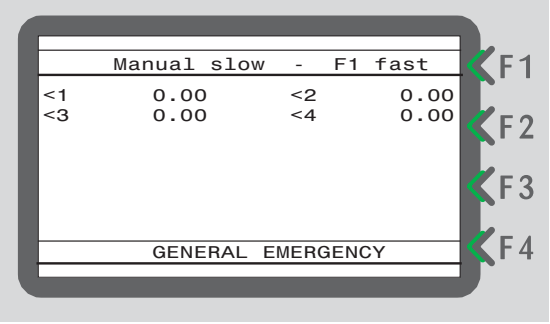
10.5 F4 - MANUAL

Function for entering into manual movement of the axes.
Press “F4” and the display will show as follows.



In the upper part of the display the speed that computer will move the axes manually, at low speed in this case.
To move the axes at a higher speed press “F1”.
In the central part of the display all the axes present and their current positions are listed.
In the lower part of the display you can see the state of the machine at this moment.
Pay particular care when moving the axes manually, as all overload sensors on the motors will be deactivated.
It’s important to remember that when in “MANUAL” mode the active keys are the ones with white characters on grey background.

1) U + Arrow down
   Advances the pick up trays
2) Z + Arrow down
   Advances the placing trays or pots
3) X + Arrow to the right
   Moves the trolley from left to right
4) X + Arrow to the left
   Moves the trolley from right to left
5) Y + Arrow up
   Raises the trolley
6) Y + Arrow down
   Lowers the trolley
7) W + Arrow to the right
   Moves the heads towards the right
8) W + Arrow to the left
   Moves the heads towards the left

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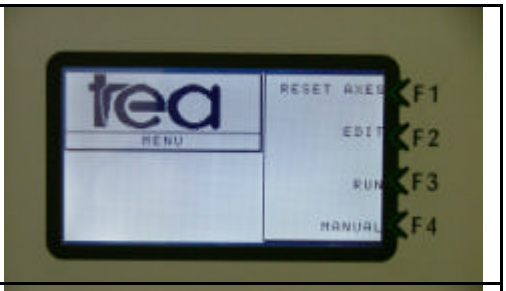
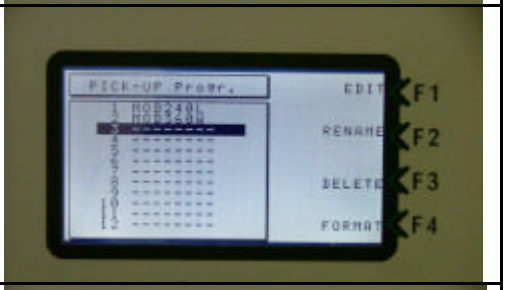
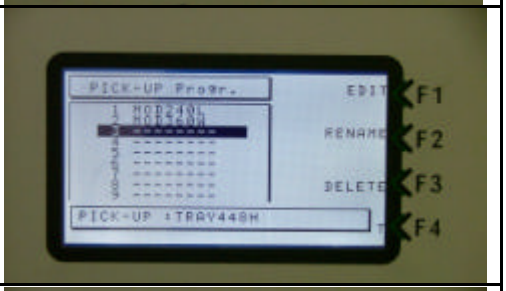
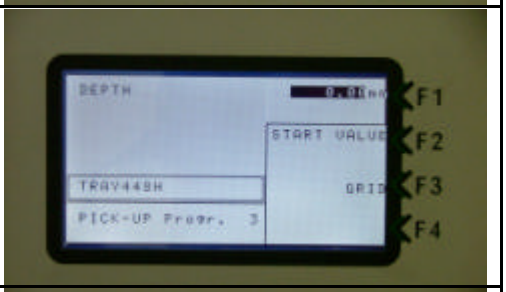
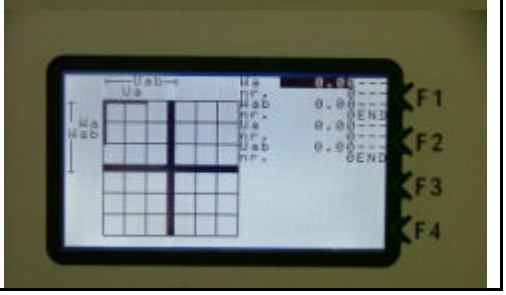
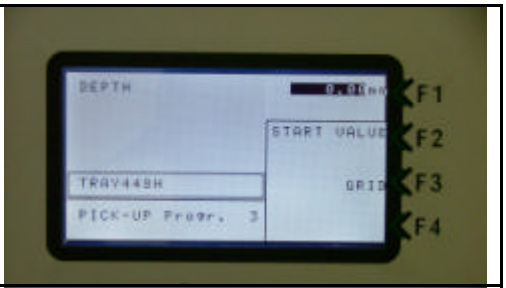
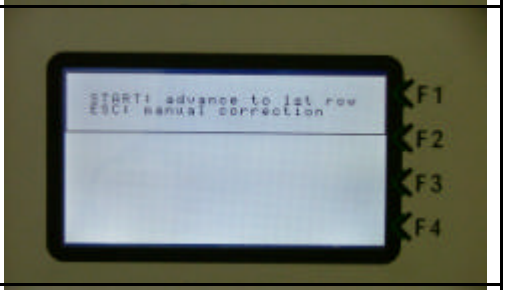
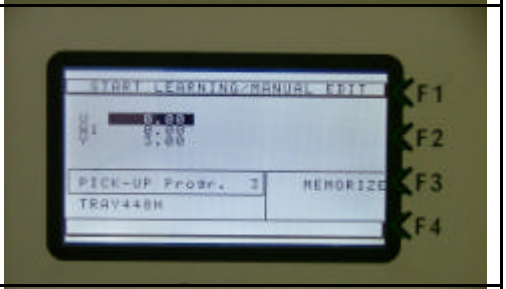
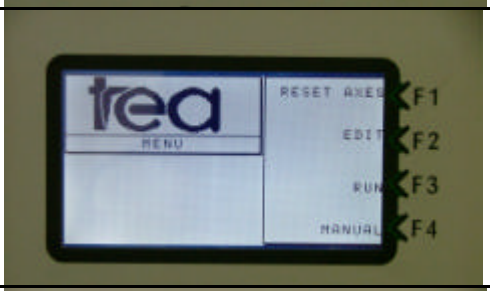
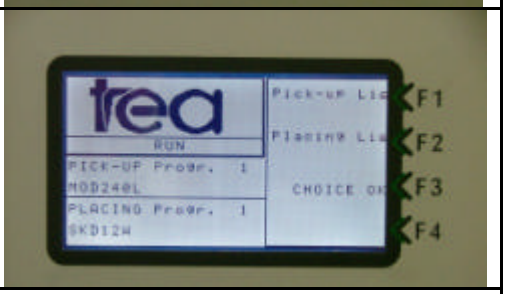
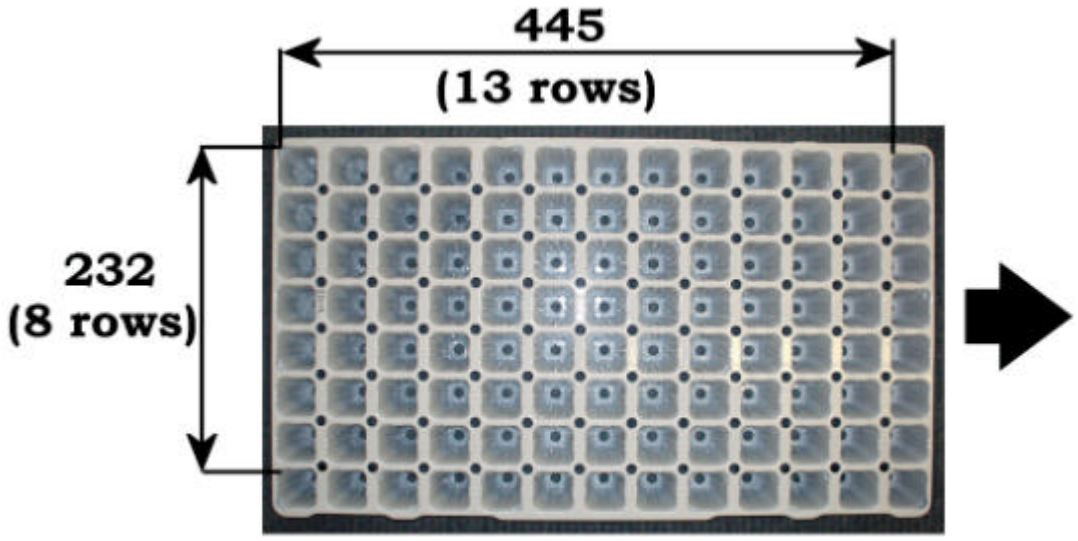
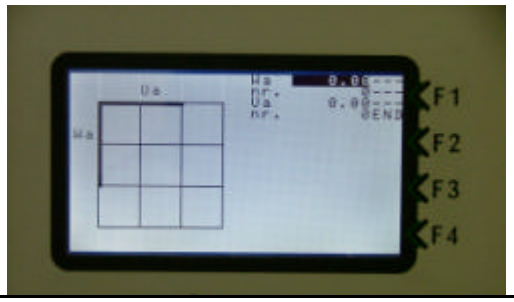
TEA XP600M Transplanter
Entering a plug tray program

From the RUN Menu, press ESC to go to the Main Menu. Press F2 to go to the EDIT Menu	
Press F1 to go to the Pick-up List	
Use the Down Arrow button to highlight a blank program location, and press F1 to Edit.	
Enter the new program name (up to 8 characters), and press ENTER	
When this screen appears, press F3 to enter the grid dimensions	
Use the Shift+PgUp keys to select the grid type. Enter the tray dimensions, pressing ENTER after each entry. When complete, press SAVE or ESC to move to the previous screen.	 

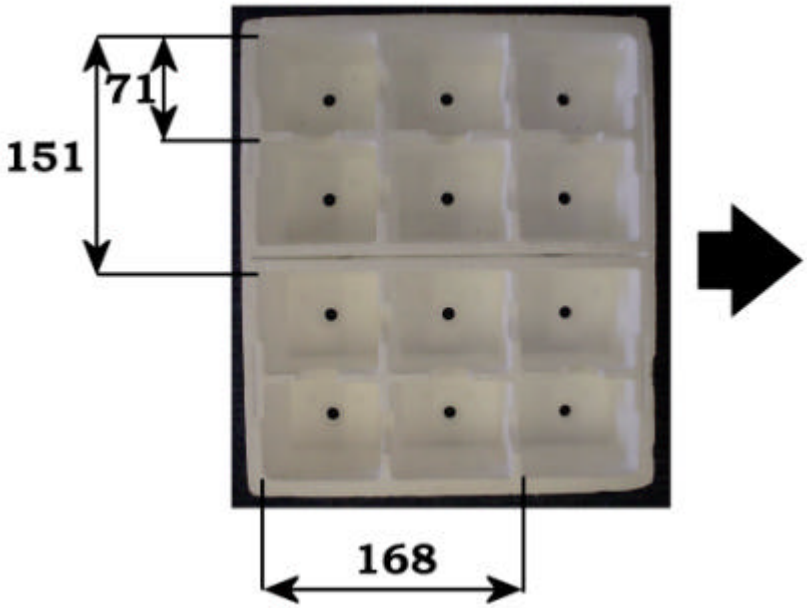
Press F2 to start the process of determining the first row position. If a message “Pickup: rows excluded” or “Pickup: heads excluded” appears, press ENTER to continue.	
Press the green START button, and place a plug tray on the conveyor belt. The tray will advance and stop at a position just short of the correct place for the first pickup row. Depending on the software version, the next screen will appear automatically – If not, press the ESC key.	
Press F4 to extend the needles, and using the grey U, W, and Y keys, position head number 1 inside the centre of the plug on the left hand side of the first row of the tray. (Ignore the other heads). When you are happy that it is correctly positioned, press the F3 key to memorize. You will be asked to confirm – Press Shift+Y, and the dimensions will appear on the screen.	
Press ESC, then ESC again, and you will be asked to Save – Press Shift+Y, and the display will show SAVING…	
To run and test your program press ESC, then F3 to Run	
Press F3 for Choice OK. Note that you MUST have a placing program selected. If a message “Pickup: rows excluded” or “Pickup: heads excluded” appears, press ENTER to continue.	
Press Start, and check the program. If there are any changes required, go back to the EDIT Menu, select F1 (for Pickup), and highlight the program with the down arrow key. Select F1 and edit the dimensions as required	

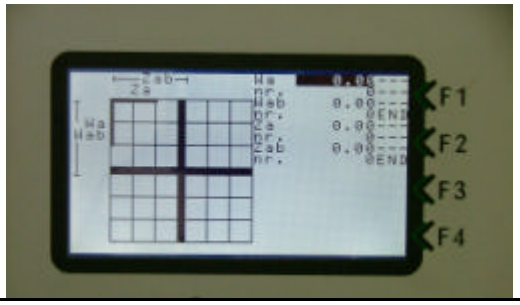
Plug Tray & Pack Programming
Sample Grids



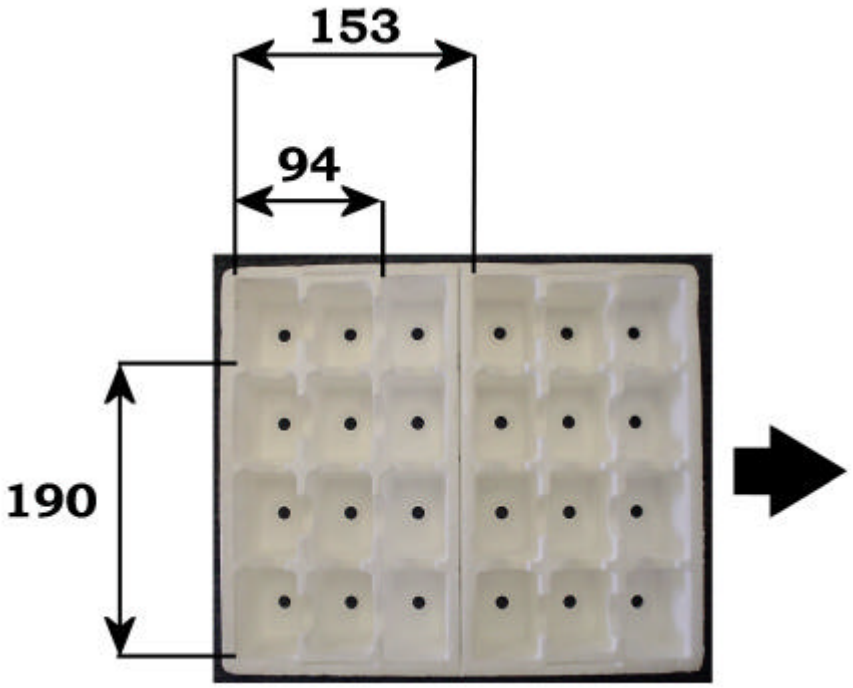


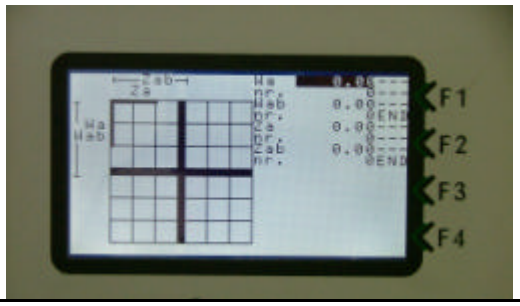
Wa= 232.00
Nr.=8
Ua=445.00
Nr.=13



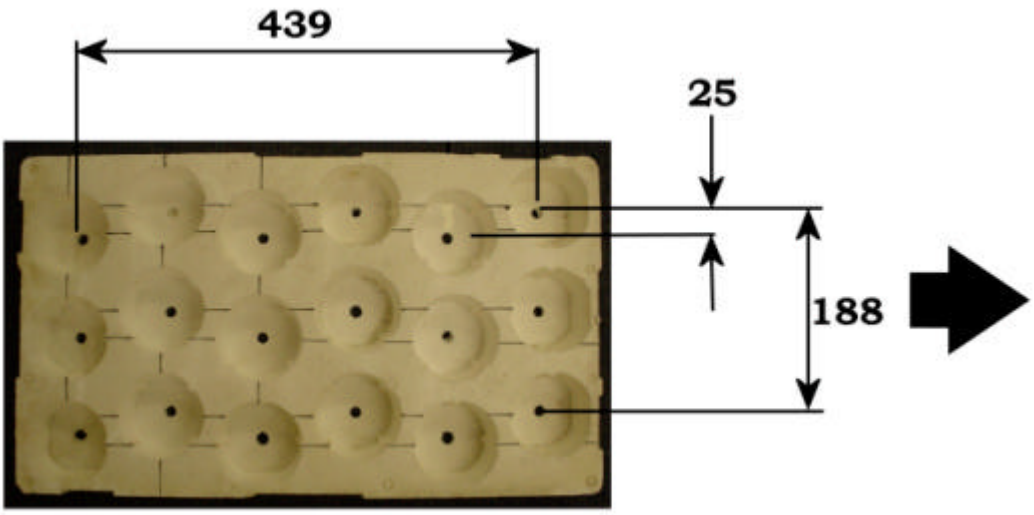


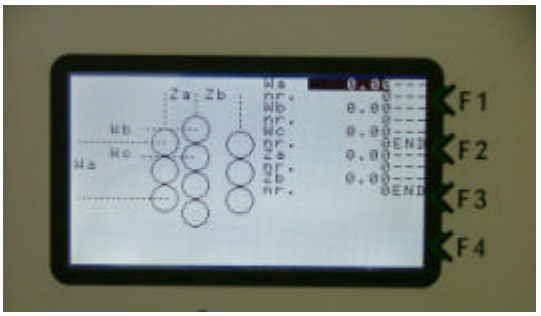
Wa = 71.00
Nr. = 2
Wab = 151
Nr. = 2
Za = 168.00
Nr. = 3





Wa = 190.00
Nr. = 4
Wab = 0.00
Nr. = 0
Za = 94.00
Nr. = 3
Zab = 153.00
Nr. = 2





Wa = 188.00
Nr. = 3
Wb = 25.00
Nr. = 3
Wc = 00.00
Nr. = 0
Za = 439.00
Nr. = 6
Zb = 0.00
Nr. = 0

Technical Service Bulletin

Date: 03/02/05
Model: Hamilton TEA XP600M Transplanter
Subject: Shutdown Procedure & Backups

Shutdown Procedure

It has been found that the Transplanter computer can lose all the tray program data if it is switched off while the computer is saving program modifications. The saving process can also happen automatically while the machine is running, if changes are made to the pickup or planting height, for example.

Therefore, when shutting down the machine, get into the habit of following this routine:

- Exit any running program by pressing and holding the STOP button
- At the menu titled RUN, press the ESC key
- At the menu titled MAIN it is safe to switch off at the main power switch

Backups

To ensure that essential data is not lost in the case of a mains electricity failure, it is important to make backups of the tray program data and machine parameters. It is suggested that this be done every time a new tray program is entered into the computer memory. The backup routine is as follows:

1) Insert a formatted floppy disk into the drive
2) Press and hold F2 key while turning on the transplanter
3) The display will show: F1: Save Text
   F2: Save Parameter
   F3: Save List
   F4: Save All
   To save all data press F4, and then F2 (New File) at the next screen. Enter a name for the file (up to 8 characters) and press the Enter key. We suggest using a file name such as ALDDMMYY, where DD is the day, MM the month and YY the year – i.e. AL010205
4) The transfer process takes about 10 minutes, during which time the display shows SAVING…. When finished, the display shows TRANSFER OK.
   DO NOT switch off the machine during the saving process.
5) Press the Esc key and switch off.
6) Restart the machine