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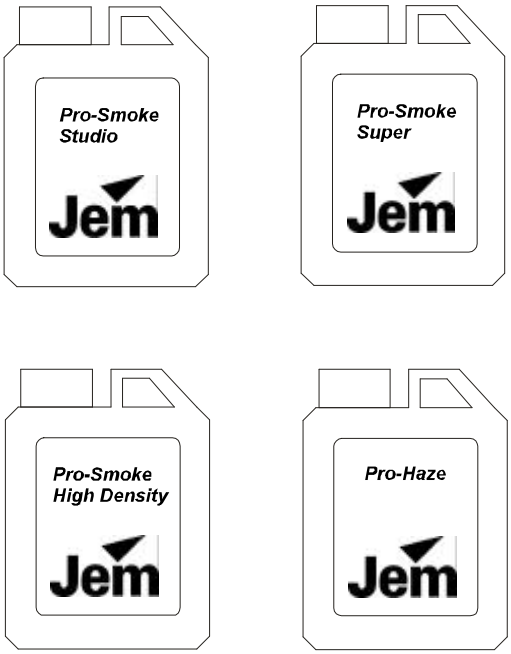
USER GUIDE
VERSION 1.2

Roadie X-Stream

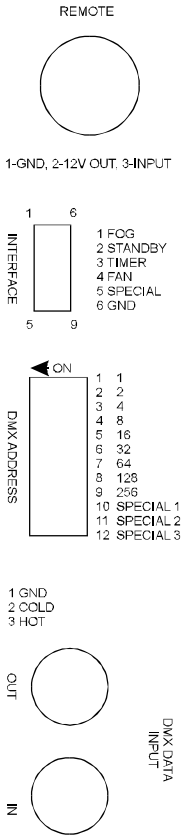
Fluids Suitable for this system:



NOTE! The JEM warranty will be void if any fluid other than JEM approved fluid is used. If other fluids are used there could be serious damage to the machine and the fluid may not have been tested for use in public areas.

ROADIE X-STREAM

CONNECTIONS



FUSE RATINGS

The Roadie X-Stream uses three fuses in addition to the main input circuit breaker. They should be replaced with the value and type detailed below:

Left/Right Power PCB

12AT

Fan/Main transformer

5AT

These fuses are located internally and should not be accessed without first disconnecting the power supply.

SPECIFICATION

HEAT EXCHANGER
- 2.5KW heater (240V)
- Twin wide bore steel vaporizing coils
- Ceramic thermal trip for over-temperature protection
- Electronic Temperature control using thermocouple
- Note that each Roadie X-Stream uses two heat exchangers

FLUID SYSTEM
- Oscillating piston high pressure fluid pumps (4 off)
- Low fluid detection by electronic sensor
- 2 x 9.5L fluid containers (2.5 US Gal.)
- Maximum fluid consumption 650mL/minute

REMOTE CONTROL OPTIONS
- DMX512 decoder:
  - Required Channels = 2
  - Output is proportional for all levels above 12%
  - Channels supported = 1 to 511
  - Valid start codes = 0 (dimmer data only)
  - Full framing error detection implemented
- Analogue control via standard JEM Multifunction Contoller.
- Optional PLC interface for simple switching control of the system.

CONTROL PANEL
- 2 x LED displays with 4 button keypad
- Output level control from 0 to 100% for Fog and Fan
- Timer range:
  - Delay time (toF) 0 seconds - 90 seconds
  - Run time (ton) 0 seconds - 90 seconds
- 4 x 'fast access' switches to allow rapid set-up of the output levels

FAN UNIT
- High pressure centrifugal fan (375W)

OUTPUT CONNECTION
- Ducting ring to accept 300mm (12") flexible ducting.

POWER REQUIREMENTS
- Input voltage 200 - 250vac
- Input power (max) 5.5Kw
- Frequency 50/60Hz.

USER GUIDE CONTENTS

Introduction	2
Features	2
Safety Guidelines	3
Machine Layout	4
Commissioning The Machine	5
Remote Control Options	5
DMX Operation	6
The Display	8
Control Panel Functions	10
The Timer	11
Basic Operation	12
The Fluid System	13
Display Messages	14
Basic Fault Finding	15
Specification	16
Connections	17
Fuse Ratings	17

INTRODUCTION

The Roadie X-Stream is the first of a new generation of JEM professional smoke machines, designed for touring and installation in a variety of applications. Provision has been made for easy integration into most common control systems currently used in the entertainment industry. As well as providing remote control options via DMX, the machine comes with a comprehensive control panel for local operation and display of operating parameters.

The smoke is provided by two heat exchangers firing into the airstream from the high pressure centrifugal fan.
The high output pressure from this type of fan makes it particularly suitable for operation into a flexible ducting system. Independent control of smoke and fan is possible.

A fluid container with 9.5L capacity (2.5US Gal.) Is provided for each heat exchanger unit. To allow reliable unattended operation, the fluid level is monitored electronically and the machine shut down if necessary.

All machines come with robust carrying handles, and eye bolts for lifting the machine.

FEATURES

High pressure centrifugal fan

2 x 9.5L fluid capacity

Pump Ramping system for continuous operation

All digital control system

2 x 2.5KW heat exchangers

DMX512 interface (two channel)

Optional PLC interface

Non-volatile memory for user settings

Electronic low fluid detection

High pressure piston pumps.

LED displays for FOG and FAN controls.

Fast access controls for easy set-up.

Accurate timer

Remote interface.

Automatic supply frequency detection (50/60Hz).

Fan Display

FAn/oFF	Displayed when the Standby switch is set to OFF.
FAn/04	Shows the current output level for the Fan.
FAn/SEr	DMX control is being used on the machine.

BASIC FAULT FINDING

The Roadie X-Stream is a complex machine and will require a competent service technician to repair any major faults. However, the following guide will allow the user to overcome the more common problems.

SYMPTOM	CAUSE	CURE
No fog output when the machine is fired using the Fog or Timer switch.	Machine is not ready	Allow time to reheat
	Fluid is below min level	Add fluid
	Standby switch is OFF	Set standby to ON
No fog output when using DMX to fire the heads	Incorrect DMX address	Check settings
	Machine not ready	Allow time with DMX on
	No DMX termination	Fit 120 ohm resistor
Flu Lo is displayed on the Fog display	Fluid level is below min	Add more fluid
Machine is not ready after 20 minutes heating time	Standby switch is OFF	Set Standby ON
	Blown fuse on Power control PCB	Disconnect supply and replace fuse.
Fog disperses too quickly	Wrong grade of fluid used for the application	Choose a longer lasting fluid (see front cover)
	Fan level too high	Reduce Fan output level

DISPLAY MESSAGES

The following list shows the messages possible, and the context under which they are displayed. Only the messages available under normal operation are shown. Messages shown when using the menus, are detailed in other sections of this handbook.

Fog Display

Fog/oFF	Displayed when the Standby switch is set to OFF, indicating that the machine cannot be fired and the heaters are OFF.
Fog/Err	Shows that the Standby switch is ON but neither of the heaters are on. This is an error condition and should not normally occur.
Fog/HtL	Indicates that the left-hand heater is running but that the machine is not ready to fire. This may indicate a fault if the condition persists for longer than 20 minutes, but can also occur if only one heat exchanger is producing fog.
Fog/Htr	Indicates that the right-hand heater is running but that the machine is not ready to fire. This may indicate a fault if the condition persists for longer than 20 minutes, but can also occur if only the right heat exchanger is producing fog.
Fog/Ht	Displayed when both heaters are running but the machine is not ready.
Fog/rdy	The machine is ready to fire using the Fog or Timer switches.
FLu/Lo	Indicates that the fluid in one of the containers is below the minimum level to operate the machine. Only visible when the machine has reached the ready state.
Fog/SEr	DMX control is being used on the machine.
Fog/05	The FOG switch is being used to fire the machine. The number displayed is the current Fog output level in the range 0 to 20

SAFETY GUIDELINES

Always use JEM approved fluid in the container supplied with the machine. Do not bypass the fluid sensor, this could cause damage to the machine.

Check the voltage is correct for use with the machine, the voltage setting is printed on the serial label.

When lifting or suspending the machine, use the eye bolts located on the top of the machine. All 4 bolts should be used to support the machine.

Do not remove the cover or attempt to repair a faulty machine, an authorized JEM dealer should be contacted in the event of a faulty machine.

Always use smoke machines in well ventilated areas, over use could affect sufferers of asthma or other chest conditions.

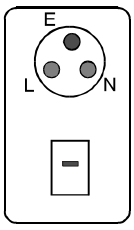
This machine is not waterproof, and should not be exposed to wet outdoor conditions.

Do not spill fluid over the machine, if fluid is spilt clean with a damp cloth and contact an approved JEM dealer for advice.

Never touch the nozzles at the front of the machine; the nozzle can stay hot for up to 10 hours

Refer servicing to qualified service personnel. Disconnect the machine from the power supply before removing any covers.

Mains Inlet Wiring Instructions

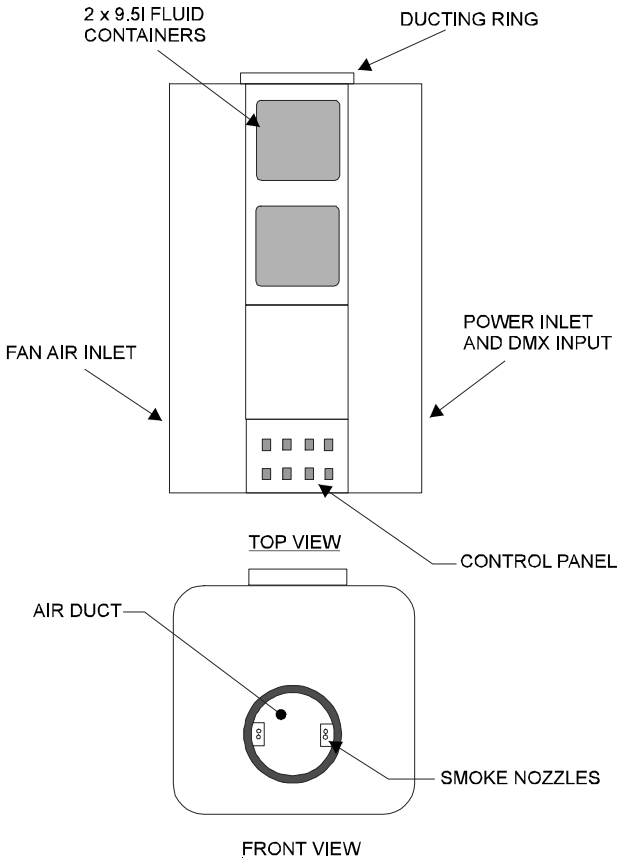


View Into Power Inlet Box.

The Roadie X-Stream is fitted with a 'C' form 32A connector for the power inlet. The connector is a 3 pin 240V type and is wired internally as shown.

To connect to US 208V supplies, the Neutral pin can be connected to the second phase of the 120V system, while phase 1 is connected to the Live pin.
This equipment must be earthed.

MACHINE LAYOUT



THE FLUID SYSTEM

The Roadie X-Stream uses two 9.5L (2.5 US Gal.) containers to give approximately 4.5 hours of continuous operation at full output. This will vary with power supply voltage, which will determine the maximum continuous output level.

The machine control system uses a 'Pump Ramping' technique to allow continuous operation with moderate input power requirements. When the output level is set to maximum, the machine will give maximum output until the heat exchanger has used its energy reserves. The control system will then override the output level setting and reduce the pump speed to match the output to the available input power. This ensures that the output will be continuous, although at a reduced level.

Continuous operation gives rise to the possibility of pump damage if the machine runs out of fluid. This is overcome in the Roadie X-Stream by using an electronic fluid sensing system, ensuring that the pumps are shut down when the fluid level is too low. The Left-hand display will show a Lo Flu message to warn the user that the machine is shut down due to lack of fluid.

Variations in pump performance due to supply frequency differences (50/60Hz), are compensated for automatically. Supply voltage changes will also affect the pump performance, and can be catered for by using the Supply Voltage menu (SuP) on the right-hand display unit. Using the Menu key, select the SuP menu and press enter. Now adjust the voltage to match the local power supply voltage (valid range is 200 - 250V). The pumps will now run at the optimum level for the conditions.

Remember that the type of fluid used will play a large part in determining the resulting effect. The list of fluids inside the front cover of this handbook shows the main fluids compatible with this machine. Choose a fluid suitable for the venue and type of effect you want to create. Generally, use the higher density fluids (pro-smoke super) for a denser and longer lasting effect.

BASIC OPERATION

The following instructions explain how to operate the basic functions of the machine. It is assumed that the machine is being started from cold.

Starting with all the control panel switches OFF, and the display showing 'OFF', go through the following sequence.

Set the Standby switch to ON.
Fog display shows FOG/Ht
Fan display shows FAN/04

Use the Fog1 switch to set the output levels.

When the machine is ready (after approx. 20 minutes heat-up time) fog can be produced.
Fog display shows FOG/Rdy
Fan display shows FAN/04
If starting the machine for the first time, or after the fluid has been changed, the pumps may need to be primed.
Do this by setting the Fog output to 15 (use the FOG 2 fast access switch) and firing the machine for 10 seconds, or until fog is produced at the output nozzles.
If the pumps have not primed after 20 seconds, there may be a problem with the fluid system. Refer to the Fault Finding section of the handbook for advice.

Set the Fog switch to ON to produce continuous output from the fog and fan systems.
Fog display shows FOG/07
Fan display shows FAN/04

Set the Timer switch to ON to produce timed output (read the Timer section to see how to configure the timer). Note that the Fog switch overrides the timer switch.
Fog display shows ton/04,toff/03 etc
Fan display shows FAN/04

To run the fan continuously, the Fan switch must be set to ON. The speed is controlled using the Fan menu on the right-hand display unit.

COMMISSIONING THE MACHINE

Unpack the machine and look for any obvious signs of damage.

Place the machine on a level surface and fit two containers of JEM/Martin approved fluid into the fluid compartment. Fit the fluid lines and cap to the containers.

Check the wiring instructions in the Safety Guidelines section of this handbook and connect the machine to the power supply.

Set the circuit breaker (overload trip) in the power inlet box to the ON position, and look for the start-up message on the displays.

Set all the switches on the lower half of the control panel to OFF and refer to the Basic Operation section of this handbook for information on how to use the main functions of the machine. Read the Safety Guidelines before using the machine.

REMOTE CONTROL OPTIONS

The Roadie X-stream provides the user with 3 ways to implement a remote control on the machine. The main control panel is fixed and can not be removed for remote operation.
All the remote interfaces are located on the panel adjacent to the power inlet box.
The options are:
DMX 512 Digital Interface.
The interface uses the two XLR 3 connectors marked DMX on the interface panel, and uses the usual DMX electrical standards (RS 485). The inputs are protected against overvoltage and an ouput connector is provided to allow multidrop operation of the link.
Remote Interface.
The remote interface uses an XLR 3 connector to allow a standard JEM remote to fire the machine. Only simple ON/OFF control can be achieved, the output level must be set on the machine's control panel.
PLC Interface.
This connection is an option available to installers who wish to control the machine using the ouputs from a standard Programable Logic Controller (PLC). When the interface PCB is fitted, 12/24v DC control signals can be used to switch the Fog, Standby, Timer and Fan functions. The output levels and timer settings must be made using the control panel.

DMX OPERATION

The machine may be operated using the industry standard DMX 512 digital control protocol. This allows the control of the fog system to be easily integrated with the lighting system in most installations.

DMX may be used without changing any of the settings on the main control panel. When the system detects a valid DMX data stream on the input, the control will default to the DMX system levels. Any attempts to control the machine from the control panel will have no effect until the DMX signal is removed. The displays will both show SEr, indicating serial input control via DMX.

To ensure correct operation of the displays, the standby switch should be set to the ON position when using DMX.

The machine requires two channels, with the address of the first channel set on the DIP switch. The channels control the FOG and FAN output levels in the following manner.

Channel 1
FOG output level
0 - 32 zero output (dead-band)
33 - 255 proportional output level control
Implemented in 20 discrete steps

Channel 2
FAN output level
0 - 32 zero output (dead-band)
33 - 255 proportional output level control
implemented in 20 discrete steps

The system implements true proportional control of the fog and fan output rather than the simple switching functions found on other equipment. The output levels of FOG and FAN are not linked in any way during DMX operation, and must be programmed separately.

The DMX base address can be set to any channel in the range 1 - 511 using the DIP switches. The channel number must first be decoded into binary format before being set into the switches.

FAN: Setting this switch to ON, will give continuous fan output at the level set on the display. The Standby switch must be set to ON for this function to work, although the machine need not be ready (Rdy).

THE TIMER

The timer system is implemented in software using the machine's main control PCB. As such, the timing is crystal controlled and will be of good accuracy when compared to the usual analogue timers commonly found on fog machines. The timer is enabled by setting the Timer switch on the control panel to ON.

Pressing the Timer switch will cause the timer to start from the beginning of the ON period and run through to the end of the OFF period, the cycle will then repeat until the Timer switch is set to OFF. The timer will only function when the Standby switch is set to ON and the machine is ready (RdY). Switching the Timer to OFF at any time during the cycle will halt the operation.

While the timer is running, the left-hand display will show the elapsed time in seconds. The display will alternate between the period name (ton/toF) and the elapsed time in seconds.

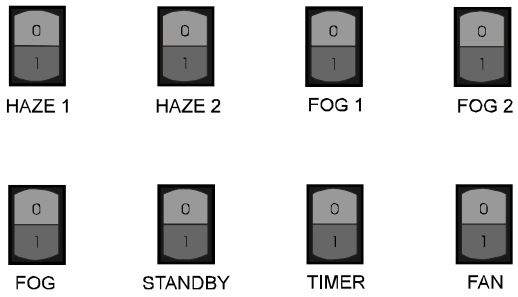
To set the time periods, use the Menu key on the left-hand display to set the 'ton' menu as current. Press the Enter key to see the current value for the On Time (ton), and make adjustments using the Up/Down keys. Now press enter to store the value and use the menu key to select the Off Time (toF) menu. Adjust the value as for the On Time, and then enable the Timer switch on the control panel to test the settings.

The current Fog and Fan output levels will be used by the timer system when in the ON period.

CONTROL PANEL FUNTIONS

The control panel provides a means to enable the various functions that control the Fog and Fan operation. The lower row of switches have a maintained action, and are used to operate the machine. The upper row are momentary 'Fast Access' switches that allow preset operating levels to be entered into the memory without using the display keys. They set Fog and Fan levels simultaneously and are set to give four of the most common effects. Use one of these settings as a starting point when setting up the machine, then make fine adjustments using the display keys until the effect is correct.

The layout of the control panel is shown in the following drawing.



The lower switches are used to set the operating mode of the machine and are used individually or in combination. The functions available are explained below.

FOG: Gives Fog and Fan output at the levels currently set using the display system. The machine must be Ready before fog can be produced.

STANDBY: The standby switch brings the machine into operating mode and will start the heaters. This switch must be ON to use the Fog switch or the Timer. When Standby is OFF, the machine will display OFF on both displays. With standby ON, and the machine ready, Rdy will be on the Fog display.

TIMER : When the machine is Ready, (at operating temperature), the timer switch will start the timer running using the settings from the display.

The machine uses a 'pump ramping' technique to allow continuous operation. This means that transmitting DMX 100% will cause the machine to run at full output until the temperature falls and the output is automatically reduced. The output will remain at this level until the DMX signal is reduced, or the fluid is exhausted. There is no possibility of damage, since the electronic fluid level sensor will shut the machine down.

The fan output level is not affected by the ramping system, and will run continuously at the set level.

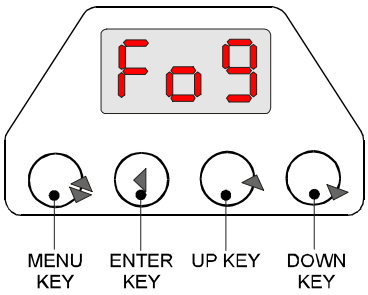
The onboard timer functions are not accessable via the DMX system. Any timing of the output must be done using the programming capabilities of the DMX console being used to control the system.

The binary weighting of the DIP switches is shown on the panel next to the switches.

THE DISPLAY

Two LED displays are used in the Roadie X-Stream to show status and control information. The left display shows all information for the fog generation functions of the machine, whilst the right display shows the information for the fan functions.

Located below each display are 4 function keys that can be used to control the display and the settings on the machine. The functions of the keys are shown in the following drawing.



The message displayed will depend on the operating mode of the machine at the time. However, pressing the menu key at any time will cause the display to go into the edit mode, allowing the operating parameters to be adjusted. After approximately 5 seconds since the last keystroke, the display will leave the edit mode and revert to displaying the current status information.

Pressing the menu key will display the current menu function, whilst pressing and holding will scroll through the available menus. All keys work the same way, and can be operated with single keystrokes or held down to force the display to scroll through the available options/values. The scrolling function comes into operation 1 second after the key is pressed.

When the user has set the required menu function, pressing the enter key will display the current value associated with that menu item. The user can now use the UP/DOWN keys to move through the available options/values

To store the new value into non-volaile memory, the enter key must be pressed before moving on to another menu or leaving the edit mode.

When not in edit mode, the display will show information appropriate to the current operating mode. To do this, the display will alternate between two messages. The duration of the first message is typically 1 second, whilst the second message will be visible for 2 seconds. Some messages are compounded together to form one message, eg FL/Lo indicating low fluid in the fluid containers.

As an example, when the STANDBY switch on the control panel is set to OFF (0), the display will alternate between FOG and OFF. For more information about the messages to expect, see the sections covering the different control functions on the machine, eg 'THE TIMER'. The section entitled DISPLAY MESSAGES contains a complete list of the messages and the circumstances under which they are displayed.

The menus available on each display and the funstion they perform are as follows:

Fog Display

Fog
Sets the current Fog output level in the range 0 to 20.
Ton
Sets the ON time of the Timer in the range 0 to 90 (seconds).
ToF
Sets the OFF time of the Timer in the range 0 to 90 (seconds).

Fan Display

FAn
Sets the Fan output level in the range 0 to 20.
SuP
Sets the supply voltage in the range 200 to 250v.
Alt
Additional menu for future development.

The software that controls the displays and the other functions of the machine is stored in 'Flash' memory on the DMX receiver PCB. As new features become available, this program code can be updated by using the Martin Uploader programming device for the AVR microprocessor.