

CAN Display / CAN Dash Instruction Manual

user manual for protocol-specific CAN display firmware

Everything Fuel Injection

Safety note: Do not change display settings, use the Button Pad, or start firmware update functions while driving. Touchscreen operation can distract the driver.

Do Not Update: Do not update the screen when you first receive it, It will be running the latest firmware. Only update if you need to change the protocol. The version number is on the back of the display, On the display update page select the Hardware version number to take you to the firmware for your hardware.
<https://www.everythingfuelinjection.com/display/>



1. Overview

This CAN display is a touchscreen dash designed to show live engine, vehicle and auxiliary data from an installed CAN protocol firmware. Different firmware versions can support different ECU brands or CAN protocols, while the main display operation remains the same.

- Multiple display layouts for engine and vehicle data.
- Configurable display positions so the user can choose which channels appear on each page.
- User-created custom CAN channels for additional data not included in the loaded protocol firmware.
- Pressure unit selection: PSI, BAR or kPa.
- Temperature unit selection: Celsius or Fahrenheit.
- Speed unit selection: km/h or mph.
- Speed source selection where supported by the loaded firmware.
- SD card data logging to CSV files.
- Live CAN Bus Monitor for checking received CAN traffic.
- On-screen CAN Button Pad with configurable transmit buttons.
- CAN I/O module screen for monitoring inputs and controlling outputs.

Protocol note: Built-in channels, channel names and data availability depend on the firmware loaded into the display. This manual explains how to use the display, but does not lock the product to one ECU protocol or one set of CAN addresses.

2. Quick Start

1. Power the display and allow it to complete the boot screen.
2. Confirm the correct protocol firmware is loaded for the vehicle or CAN system being used.
3. Confirm the CAN speed matches the vehicle or device network.
4. From the main display, use the bottom-left touch area to cycle through the available display layouts.
5. Use the bottom-right touch area to open the Settings Menu.
6. Use Configure Displays to choose which channels appear in each configurable display layout.
7. Use Save & Exit after changing settings that need to be stored.
8. Use the CAN Bus Monitor if you need to confirm whether CAN messages are being received.

3. Main Screen Touch Controls

The main screen uses touch zones rather than visible buttons in some areas. Use a short deliberate press rather than an extremely quick tap.

Touch area	Function
Bottom-left area	Cycles to the next display layout. The selected layout is saved.
Bottom-right area	Opens the Settings Menu.
Top-right area	Starts or stops SD card logging when an SD card is detected.

Touch area	Function
Centre of screen	Opens the CAN Button Pad screen. This is an invisible centre touch zone.

4. Display Modes

The firmware cycles through six display modes. The available channel values depend on the protocol firmware loaded into the display.

Mode	Display layout	Purpose
0	Digital Grid	A 4 x 3 grid for up to twelve selected channels.
1	Tach / Needle Display	Main tach-style display with eight side readout positions.
2	Ring Gauge Display	Six circular/ring-style gauge positions.
3	User Editable Display3	16 configurable gauge/value widgets plus 8 indicator widgets.
4	Bar Display	Six horizontal sensor bars.
5	Quad Display	Four large channel areas: top-left, top-right, bottom-left and bottom-right.

5. Settings Menu

Open the Settings Menu from the bottom-right touch area on the main screen. The menu is arranged as a 4 x 3 grid.

Button	What it does	How it changes
RPM REDLINE	Sets the display redline value.	Increases by 250 rpm each press. Wraps back to 3000 rpm when it reaches 10000 rpm.
AFR / LAMBDA	Selects wideband display mode.	Toggles between AFR and Lambda.
CONFIGURE DISPLAYS	Opens display channel assignment menus.	Choose channels for Digital Grid, Tach, Ring Gauge and Quad layouts. Also opens Display3 and Custom CAN Channels.
BRIGHTNESS	Sets backlight brightness.	Increases by 10 each press. Wraps back to 70 when it reaches 250.
DISPLAY	Changes the main text/display colour.	Cycles through RED, YELLOW, GREEN, BLUE, GRAY, ORANGE, AQUA and PINK.
CAN I/O	Opens CAN I/O module monitor and configuration.	Allows CAN I/O enable, IDs, analog scale/offset, names and output controls.
CANBUS SPEED	Selects CAN bus speed.	Toggles between 500 kbps and 1 Mbps. Follow the on-screen restart instruction after changing.
MORE OPTIONS	Opens advanced options.	Includes system info, SD card maintenance, firmware update, CAN monitor, temp/speed units and factory reset.
NEEDLE	Changes needle colour.	Cycles through the same eight colour options.

Button	What it does	How it changes
SPEED INPUT	Selects speed source where supported.	Toggles between the available speed input choices for the loaded firmware.
PRESSURE	Selects pressure units.	Cycles PSI, BAR and kPa.
SAVE & EXIT	Stores settings and exits menu.	Saves display colours, brightness, units, speed input, CAN speed, CAN I/O local settings, Button Pad changes and redline.

6. More Options Menu

Button	Function
DELETE SD CARD	Runs the SD card delete routine and resets the log file number.
SYSTEM INFO	Shows display firmware information, CAN speed, display type, SD card status and firmware update file status.
FIRMWARE UPDATE	Starts a firmware update from the SD card when a valid update file is present. Use only when supplied with a compatible update file.
CAN BUS MONITOR	Opens the live raw CAN monitor.
TEMP UNIT	Toggles Celsius/Fahrenheit.
FACTORY RESET	Erases saved display settings, custom CAN channels, Button Pad configuration, colours and brightness, then reboots to defaults.
SPEED UNIT	Toggles km/h/mph.
BACK TO MENU	Returns to the main Settings Menu.

7. Configuring Display Channels

The Configure Displays menu lets the user choose which channel appears in each position on the configurable display pages. Built-in channel names depend on the loaded protocol firmware. Custom channels are added separately and can then be assigned to display positions.

Display	Configurable positions
Digital Grid	12 positions labelled R1C1 through R3C4.
Tach / Needle Display	8 positions: left top, left 2, left 3, left bottom, right top, right 2, right 3 and right bottom.
Ring Gauges	6 positions: top left, top right and bottom 1 through bottom 4.
Quad Display	4 positions: top left, top right, bottom left and bottom right.

Display3 uses its own editor: 16 gauge/value widgets plus 8 indicators. See sections 7A-7B.

1. Open Settings Menu > Configure Displays.
2. Select the display layout to configure.
3. Tap a position to cycle it to the next enabled channel.
4. Press SAVE to store the slot assignment.

5. Press CANCEL to discard unsaved changes and reload the previous saved layout.
6. Press DEFAULTS to restore that display page to its factory channel layout.
7. Use Reset All Defaults from the Configure Displays screen to restore all display slot assignments.

8. Built-In and Custom Channels

The display has built-in channel slots supplied by the loaded protocol firmware, plus eight user-configurable Custom CAN Channel slots. Built-in channels are protocol dependent, so this manual avoids listing protocol-specific CAN addresses.

Channel type	Description
Built-in channels	Channels already decoded by the installed firmware. Examples may include RPM, MAP, TPS, temperatures, pressures, AFR/ Lambda, battery voltage, speed, gear, duty cycle, ignition advance, flex fuel or other protocol-specific values.
Custom CAN channels	User-created channels for extra data. These require the user or installer to know the CAN ID, byte position, byte length, scaling and offset for the message being added.

9. Custom CAN Channels

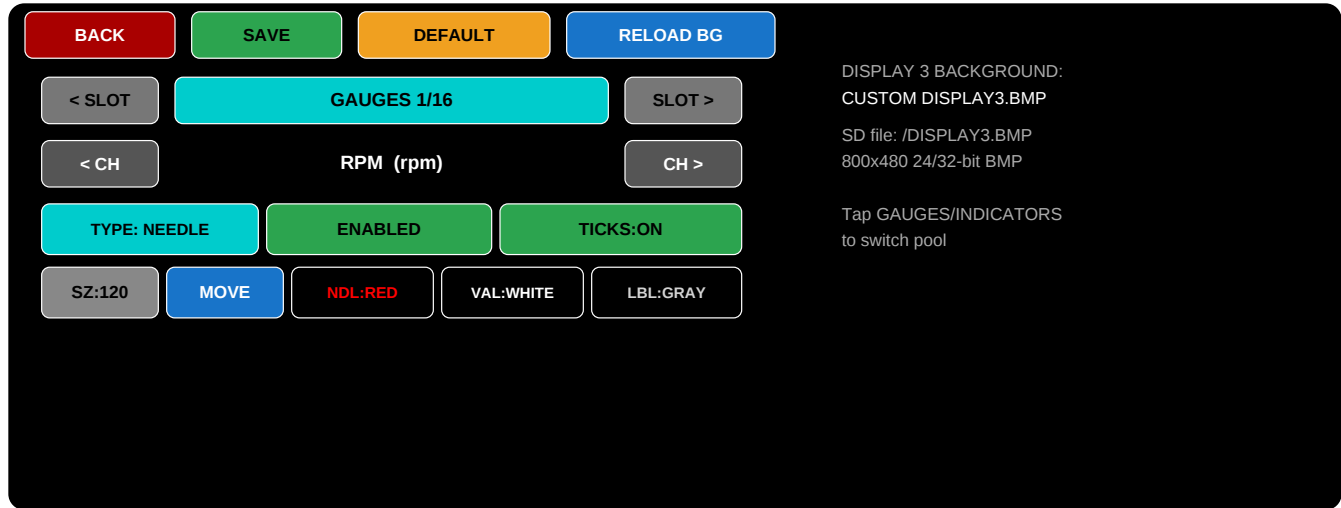
The firmware supports eight user-configurable custom CAN channels. These are saved in the display memory so they remain after power cycling.

1. Open Settings Menu > Configure Displays > Custom CAN Channels.
2. Tap an empty slot to add a new channel, or tap an existing slot to edit it.
3. Enter the CAN ID, byte position, byte count, signed mode, byte order, scale, offset and display thresholds.
4. Press SAVE in the channel editor to store the channel.
5. After adding a custom channel, return to Configure Displays and assign it to the required display positions.

7A. User Editable Display3

Display mode 3 is a fully user-editable dashboard. It provides **16 independent gauge/value widget positions** plus a separate pool of **8 indicator positions**. The widgets can use built-in protocol channels, Custom CAN Channels and other enabled channels available in the display.

Open the editor: Settings Menu > Configure Displays > Display 3.



Gauge and value widgets

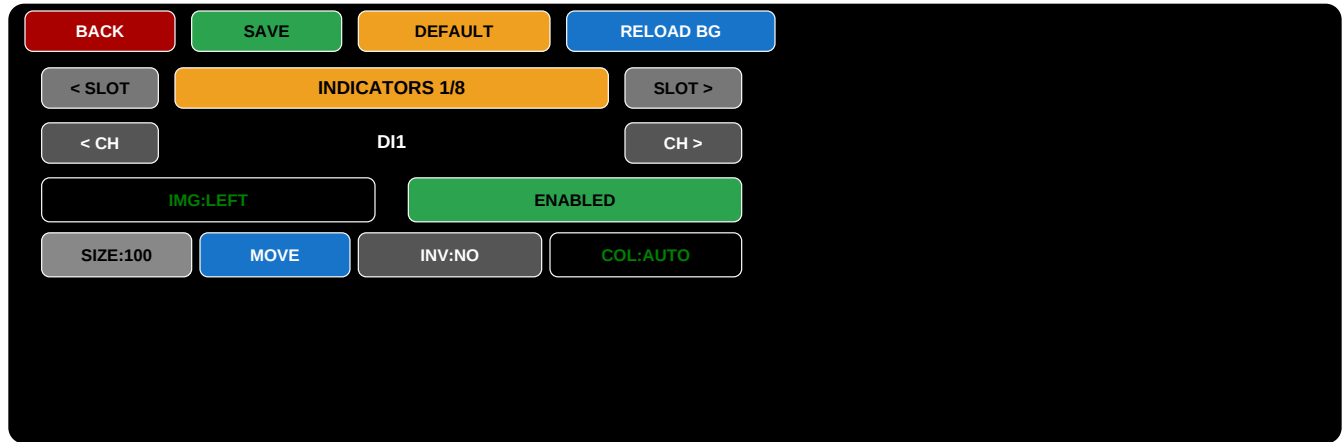
Type	What it displays	Controls
RING	Circular ring gauge with numeric value and channel label.	Channel, enable, size, move, VAL colour and LBL colour.
NUMBER	Large numeric value with channel label/unit.	Channel, enable, size, move, VAL colour and LBL colour.
NEEDLE	Analogue pointer gauge using the selected channel Min/Max range, with numeric value and label.	Channel, enable, size, move, TICKS, NDL, VAL and LBL.

Colour choices: AUTO, WHITE, RED, YELLOW, GREEN, BLUE, GRAY, ORANGE, AQUA, PINK and BLACK. For NEEDLE widgets, **NDL** changes the pointer/hub, **VAL** changes only the numeric value, and **LBL** changes the channel label and tick marks. **TICKS** can be ON or OFF.

MOVE: Touch and drag the selected item, or use LEFT / RIGHT / UP / DOWN for 10-pixel adjustments. Press DONE when the position is correct.

7B. Display3 Indicators, Background and Saving

Tap the centre **GAUGES / INDICATORS** selector to switch between the 16 gauge/value widgets and the 8 independent indicator slots.



Indicator controls

Control	Function
IMG	Cycles the indicator symbol: warning, left turn, right turn, hazard, handbrake, high beam, low beam, check engine, oil, battery, fan and fuel.
ENABLED	Turns that indicator slot on or off.
SIZE / MOVE	Changes indicator size or opens the positioning screen. MOVE forces the selected indicator visible while positioning.
INV:NO / INV:YES	Normal: channel 0 = OFF and 1 = ON. Inverted: channel 0 = ON and 1 = OFF.
COL	AUTO uses a normal automotive colour for the selected icon; a fixed colour can also be selected.

Custom Display3 background

Place **/DISPLAY3.BMP** in the root of the SD card. The image must be exactly **800 x 480 pixels**, uncompressed BMP (BI_RGB), 24-bit or 32-bit. If the file is missing or invalid, Display3 uses its built-in background. Use **RELOAD BG** after changing the SD image.

Saving Display3

An SD card is required to save new Display3 layout changes. Press **SAVE** to write the complete layout to **/DISPLAY3.CFG**. A successful save displays **SAVED!** and exits the editor. **BACK** discards unsaved edits. **DEFAULT** restores the Display3 default layout in the editor, but it is not permanent until **SAVE** is pressed.

If the SD card is removed, the dash can still boot. The latest SD-saved Display3 layout and custom background will not be available; the firmware falls back to earlier internal Display3 settings/defaults and the built-in background.

Message	Meaning / action
NO SD	No usable SD card detected. Insert the SD card and try SAVE again.
OPEN ERR	DISPLAY3.CFG could not be created/opened. Check the SD card and file system.
WRITE ERR	The settings file could not be completely written. Check or replace the SD card.
VERIFY ERR	The saved file failed read-back/validation. Retry; if repeated, check or replace the SD card.

Custom channel fields

Field	Meaning
Name	Display name, maximum 13 characters.
Unit	Unit text, maximum 7 characters. Examples: C, kPa, %, V.
CAN ID	Standard 11-bit CAN ID entered as hexadecimal, range 0x001 to 0x7FF. Use the CAN ID from the device protocol documentation.
Start Byte	First byte to read from the CAN frame. Cycles 0 to 6.
Byte Count	1 byte for 8-bit values or 2 bytes for 16-bit values.
Signed	Select YES when the raw CAN value is signed.
Byte Order	Big-endian/MSB first or little-endian/LSB first. Use the byte order from the device protocol documentation.
Scale	Multiplier applied to the raw CAN value.
Offset	Added after scaling. Final value = raw x Scale + Offset.
Min / Max	Display range used by gauges and bars.
Warn / Danger	Thresholds used to colour values yellow or red.
Decimals	Display decimal places, cycles 0 to 2.
Rev Color	When OFF, high values are warning/danger. When ON, low values are warning/danger, useful for oil pressure or fuel pressure.

Custom channel example: If a device sends a 16-bit temperature value as raw x 0.1 with an offset of -273.1, set Byte Count to 2, Scale to 0.1 and Offset to -273.1. The correct CAN ID, start byte and byte order must come from that device protocol.

10. SD Card Logging

When an SD card is detected, the top-right touch area on the main display starts or stops data logging. Logs are written as CSV files so they can be opened in spreadsheet software or imported into analysis software.

Item	Detail
Start/stop logging	Tap the top-right SD/LOG area on the main screen.
File format	CSV.
File name format	SPD0001.csv, SPD0002.csv and so on.
Log interval	Approximately every 250 ms while logging is enabled.
Delete logs	More Options > DELETE SD CARD removes display log files and resets the log number.

Logged CSV columns

#	Column	Description
1	Time	Controller time in milliseconds.
2	RPM	Engine speed.
3	Lambda	Lambda value.
4	AFR	Air/fuel ratio.
5	AFR Target	Target air/fuel ratio.
6	MAP	Manifold pressure.
7	CLT	Coolant temperature.
8	IAT	Intake air temperature.
9	TPS	Throttle position.
10	BATT	Battery voltage.
11	FUEL P	Fuel pressure.
12	OIL P	Oil pressure.
13	OIL T	Oil temperature.
14	Advance	Ignition advance.
15	Dwell	Ignition dwell.
16	PW1	Injector pulse width.
17	Duty	Duty cycle.
18	Speed	Vehicle speed.
19	Gear	Current gear.
20	PSI	Boost pressure value.
21	Flex	Flex fuel / ethanol content.
22	latitude	GPS latitude where supported.
23	longitude	GPS longitude where supported.
24	heading	GPS heading where supported.

Logging note: Some columns depend on the loaded protocol firmware and available CAN data. Unsupported channels may remain blank, zero, or unchanged depending on the firmware version.

11. CAN Button Pad

The CAN Button Pad is opened from the invisible centre touch zone on the main display. It provides twelve on-screen buttons that transmit configurable CAN output frames. This can be used for supported external devices, auxiliary controls, or custom CAN control functions.

Control	Function
Button 1-12	Sends its configured CAN state when pressed.
BACK	Returns to the previous display.
ALL OFF	Sets all button states to OFF and sends zero frames to each used Button Pad CAN ID.

Control	Function
CONFIG	Opens Button Pad Config.

Button modes and CAN values

Mode	Behaviour	CAN byte value
Momentary	Sends ON when pressed, then automatically returns OFF after about 200 ms.	0xFF while active, then 0x00.
Toggle	Each press alternates ON and OFF.	0xFF for ON, 0x00 for OFF.
2-State	Cycles OFF > LOW > HIGH > OFF.	OFF = 0x00, LOW = 0x01, HIGH = 0x02.
3-State	Cycles OFF > LOW > MED > HIGH > OFF.	OFF = 0x00, LOW = 0x01, MED = 0x02, HIGH = 0x03.

Each button has a label, CAN ID, byte position, mode, OFF glow colour and per-state colours. Button Pad frames are sent as 8-byte CAN frames. The editor allows byte positions 0 to 2. Buttons with the same CAN ID are packed into the same transmitted frame at their configured byte positions.

Default button group	Default CAN ID	Default byte positions / modes
Buttons 1-3	0x600	Bytes 0-2, Toggle.
Buttons 4-6	0x601	Bytes 0-2, Toggle.
Buttons 7-9	0x602	Bytes 0-2, Momentary.
Button 10	0x603	Byte 0, 2-State.
Buttons 11-12	0x603	Bytes 1-2, 3-State.

1. Open the Button Pad from the centre touch zone.
2. Press CONFIG.
3. Tap a button to edit it.
4. Use PREV and NEXT to select a field.
5. Use + and - to change the selected field.
6. Press SAVE to keep the edited button or CANCEL to discard changes.
7. Use SAVE & BACK in the Button Pad Config screen to store the pad configuration.
8. Use RESET DEFAULTS to restore the default Button Pad setup.

12. CAN I/O Module

The CAN I/O menu supports a remote CAN I/O module with eight digital inputs, five analog inputs and four digital outputs. The display can monitor inputs, toggle outputs and edit module CAN IDs, analog scaling, offsets and channel names.

Default setting	Default value
Input Broadcast ID	0x100
Analog Broadcast ID	0x101

Default setting	Default value
Output 1 ID	0x102
Output 2 ID	0x103
Output 3 ID	0x104
Output 4 ID	0x105
Config Command ID	0x700
Config Reply ID	0x701

CAN I/O tabs

Tab	Purpose
MONITOR	Live digital input states, analog values and output ON/OFF buttons.
CAN IDS	Edit input, analog, output and config CAN IDs. Includes Save to CAN I/O, Save Display and Read CAN I/O.
ANALOG	Edit scale and offset for the five analog inputs. Live analog values are shown.
NAMES	Rename digital inputs, analog inputs and outputs. Names are limited to six characters.

- The ENABLED/DISABLED button at the bottom-left toggles whether the display listens for and configures the CAN I/O module.
- SAVE TO CANIO writes settings to the CAN I/O module using its config command ID.
- SAVE DISPLAY stores the local display-side CAN I/O settings.
- READ CANIO requests the module to send its current configuration back to the display.
- Output buttons in the MONITOR tab send a control frame to the selected output ID.

13. CAN Bus Monitor

The CAN Bus Monitor is accessed from More Options. It shows live CAN IDs, data bytes, message count and message rate. It is useful for confirming that the display is seeing CAN traffic and for checking custom channel setup.

Item	Meaning
Green ID	Known ID recognised by the loaded protocol firmware.
Aqua ID	CAN ID used by a configured custom channel.
Orange ID	CAN I/O related CAN ID.
White ID	Other / unknown CAN ID.
COUNT	Total received messages for that CAN ID.
MSG/s	Approximate messages per second.

1. Open Settings Menu > More Options > CAN Bus Monitor.
2. Use UP and DN buttons to move through pages of IDs when more than one page is available.
3. Tap a row to filter to that CAN ID.
4. In filtered mode, the display shows byte indexes, hex bytes, decimal bytes and 16-bit big-endian word pairs.
5. Tap the filtered row again or press CLEAR to remove the filter.
6. Press BACK to return to More Options.

14. System Info, Firmware Update and Factory Reset

System Info

System Info shows display firmware information, selected CAN bus speed, display type, SD card status and whether an update file is available on the SD card.

Firmware Update from SD Card

Some firmware versions support updating from an SD card file. Use this function only when supplied with a compatible update file and instructions for the exact display firmware being used.

1. Copy the supplied update file to the SD card using the required file name from the update instructions.
2. Insert the SD card and power the display.
3. Open Settings Menu > More Options.
4. Confirm the update option does not show NO FILE.
5. Press the update button and read the warning screen.
6. Do not turn off the display during erase, programming or restart.

Important: Firmware update behaviour is firmware-version dependent. Do not attempt to load a file intended for a different display model or CAN protocol version.

Factory Reset

Factory Reset is available from More Options. It shows a confirmation screen and warns that the following saved settings will be erased:

- Display configuration.
- Custom CAN channels.
- Button Pad configuration.
- Colour and brightness settings.

Warning: Factory reset is destructive. Use it only when the display settings need to be returned to factory defaults or when saved settings appear corrupted.

15. Troubleshooting

Symptom	Likely cause	Action
No CAN data displayed	Wrong CAN speed, missing CAN traffic, or incorrect protocol firmware.	Check CAN wiring, termination, CAN speed and that the loaded firmware matches the CAN device. Use CAN Bus Monitor to confirm whether any IDs are being received.
Only some channels update	The connected device is not broadcasting those channels, or the loaded firmware does not support them.	Use CAN Bus Monitor to confirm available traffic. Check the protocol firmware notes for supported built-in channels.
Custom channel does not work	Incorrect CAN ID, byte position, byte count, signed setting, byte order, scale or offset.	Use CAN Bus Monitor to confirm the message and byte values, then correct the custom channel setup.
Custom channel does not appear in display selection	Channel not enabled/saved or display slots not updated.	Save the custom channel, then go to Configure Displays and assign it to a display position.
CAN speed change does not take effect	The network or connected device is still using another speed.	After changing CANBUS SPEED, follow the on-screen restart instruction and confirm CAN traffic in CAN Bus Monitor.
SD logging unavailable	No SD card detected or SD card failed initialisation.	Check card insertion and format. Confirm System Info shows SD Card Ready.
Update option shows NO FILE	Required update file not found on SD card.	Copy the correct update file to the SD card using the file name supplied with the update instructions.
Touch controls feel unreliable	Very quick taps may not be counted by the touch handling logic.	Use a short deliberate press in the correct touch zone.
Settings did not save	Exited without using Save & Exit, or save error occurred.	Return to the Settings Menu, make the change again and press Save & Exit.

Display3 troubleshooting

Display3 SAVE shows NO SD: insert a working SD card. Display3 saves its layout to /DISPLAY3.CFG.

Custom background missing: confirm /DISPLAY3.BMP is exactly 800x480, uncompressed 24/32-bit BMP, then use RELOAD BG.