MAME review: PR #16792 – HP LaserJet IIIP

Generated with the mame-review skill v1.2 on the 14 files of mamedev/mame PR #16792, "bus/centronics: Add the HP LaserJet IIIP laser printer"

Scope and limits

All 14 PR files were read: both layouts, the Centronics and RS-232 adapters, the printer device, the standalone driver, and the `mame.lst`, `bus.lua` and `machine.lua` hunks. Line numbers refer to the supplied zip, which could not be confirmed to match PR head `666e737`. MAME was not built or run, so layout runtime behaviour, CI, `-validate` and the commit-message bodies were not verified.

Checks: include guards ✓ (3 headers, by hand) · xmllint ✓ (both `.lay`) · srcclean ✓ for all nine C++/layout files (approximated by grep) / ✗ `scripts/src/bus.lua` · CI skipped (Checks tab shows 0) · `-validate` skipped

Blocking

- `hp_lj3p.cpp:852`, `rs232/hp_lj3p.cpp:52`, `centronics/hp_lj3p.cpp:58`, `emu/layout/hplj3p_host.lay:74-79` **[D-10]** A slot card replaces the host's default layout and assumes things about the host. `host_layout()` calls `config.set_default_layout(layout_hplj3p_host)` from both adapters. That layout hardcodes `<screen index="0">` at a fixed 1449×1087, and its comment says "assumed 4:3". A single default layout is kept per machine, so the host's own layout is discarded whenever the card is selected. A host whose first screen isn't 4:3 is stretched, and a host with no screen 0 gets a broken view. → Offer the printer as an extra view the user selects, or let the host driver opt in, rather than overriding from the card.
- `hp_lj3p.cpp:293-304` **[C-3]** `device_start` initialises all run-time state once (`:200-243`), and `device_reset` rewrites only `m_pctrl`. After a soft reset during a page, these survive while the CPU reboots:
  - `m_sheet` stays `true`, so `print_step` case 0 (`:514`) keeps rescheduling and never raises TOP for the next sheet.
  - `m_cur_active` and the armed `m_line_timer` keep running, so `video_line` asserts IRQ 5 (`:625`) into firmware that hasn't started.
  - `m_pfull`, `m_irq4`, `m_irq5`, `m_next_valid` and the other three timers survive too.

  → Reset these in `device_reset` and cancel the four timers there.

Tidy

Needs thought first

- `hp_lj3p.cpp:226`, `:257` **[C-2]** `save_item(NAME(m_view))` and `save_item(NAME(m_page))` put a 35.8 MB bitmap (2550×3508×4) and a 2.2 MB one in every save state and rewind snapshot. Screen-sized bitmaps don't go in save states. → Drop both, or return `flags::SAVE_UNSUPPORTED`.
- `hp_lj3p.h:92,146,165,196,197` **[C-2]** Saved `int` members: `m_page_y`, `m_blt_patrow`, `m_strobe`, `m_eng_bits`, `m_eng_cbits`. → `s32`, or `bool` / `u8` for `m_strobe`.
- `hp_lj3p.cpp:643-661` **[C-5]** `blt_pat_w` never reads `mem_mask`, so a byte write to 3a0000 zeroes the other byte. `blt_dest_w` hand-rolls the masking twice. → Merge each half with `COMBINE_DATA`.
- `hp_lj3p.h` **[C-8, C-9]** No `imperfect_features()` or `unemulated_features()`, although the file documents unemulated or fitted parts: font cartridge, RAM expansion, `/INIT` "not handled" (`.cpp:476`), ROP3 modelling, engine timing, and the IRQ 3 tick of unknown source whose 600 Hz rate is fitted (`.h:188`, `HOLD_LINE`). → Declare them.
- `hp_lj3p.cpp:445-454` **[D-7]** `update_parallel()` fires all five line callbacks on every call, including every `pctrl_w`. → Fire each only when its output changes.
- `hp_lj3p.cpp:598-603`, `:690-701` **[D-6]** `video_line` and `blt_out` look up `m_maincpu->space(AS_PROGRAM)` and use `read_word` / `write_word` for every word. → Cache a `memory_access<24, 1, 0, ENDIANNESS_BIG>::specific` in `device_start`.
- `hp_lj3p.cpp:400,433,484` **[D-6]** `ctrl2_r`, `status_r` and `pdata_r` use neither `offset` nor `mem_mask`. → `u16 ctrl2_r()` and so on. `blt_pat_w` and `blt_data_w` also drop `mem_mask`.
- `hp_lj3p.h:63-210` **[D-3]** The private section interleaves data, functions, constants and `struct band_t`. → Constants and types first, then data (finders together), then functions.
- `centronics/hp_lj3p.cpp:32-41` **[D-3]** `input_strobe`, `input_init` and `input_data0..7` are public, but `ctronics.h:133-154` declares them protected. `rs232/hp_lj3p.cpp:33` has the same pattern for `input_txd`; this could not be checked because `rs232.h` is not in the bundle. → Move them to `protected:`.
- `emu/layout/hplj3p.lay:8-35`, `hplj3p_host.lay:8-35` **[O-1]** Colours are baked into every element definition: four rects, the key and LED states, and twelve `t_*` text elements. → Draw shapes in white and colour each instance; use one LED element with dim and bright states.

- `hplj3p.lay:47-64`, `hplj3p_host.lay:47-64` **[O-1]** Six key-plus-label blocks differ only in position and text. → `<repeat>` with params.
- `laserjet3p.cpp:71` **[I-4]** A printer is registered with `COMP`. → `SYST`.
- `hp_lj3p.cpp:843` **[D-1]** `screen.set_palette("palette")` passes a tag string. → Add a `required_device<palette_device>` and pass it.
- `hp_lj3p.h:115-116` vs `hp_lj3p.cpp:72-73` **[L-4]** The comments disagree ("Letter image starts 50 pixels in" versus "75 pixels from the edge on Letter"). → Reconcile them.

Mechanical, one line per file

- `hp_lj3p.cpp` **[T-8]** plain `unsigned` at `:321`, `:352` and `:391`. **[T-4]** `static u8 const codes[]` (`:333`) → `constexpr u8 CODES[]`. **[T-1]** 8-digit hex without separators at `:646,648,655,657,688`. **[T-3]** `latch_band()` (`:552`) default-constructs `band_t b` and then sets each field. **[I-5]** ROM names `"1818-5008.bin"` and `"93c46.bin"` (`:112,115`) should be `<label>.<location>`. **[F-3]** missing `<algorithm>` and `<iterator>`; `screen.h` (`:94`) is already included by the header; the `.lh` includes should precede `VERBOSE` / `logmacro.h` (`:101-105`).
- `hp_lj3p.h:121` **[T-4]** `static inline const attotime LINE_PERIOD` → `static constexpr attotime`. This assumes `from_usec` is constexpr, so confirm it builds.
- `scripts/src/bus.lua:5307-5308` **[F-5, F-6]** The RS-232 entry sits before `hlemouse` and should follow it. It is also space-indented, so srcclean will rewrite it.

Nits

- `hp_lj3p.cpp:106-109` **[X-2]** four consecutive blank lines. `hp_lj3p.h:55` has a blank line after `protected:`.
- `laserjet3p.cpp:47` **[F-4]** `static` inside the anonymous namespace is redundant.
- `hp_lj3p.cpp:352` **[T-2]** `std::popcount(unsigned(data))`; `popcount(data)` works for `u8`.
- `hp_lj3p.cpp:221`, `hp_lj3p.h:126-127` **[T-4]** `2550` and `3508` are repeated magic numbers. → Name them.
- `hplj3p.lay` vs `hplj3p_host.lay` **[O-1]** The 28 element-definition lines (`:8-35`) and the `panel` group are duplicated verbatim apart from tag prefixes.

Submission

- **[S-2]** The title `bus/centronics: …` is stale, since the device now lives in `machine/` with RS-232 adapters and a standalone `hp/laserjet3p.cpp`. → e.g. `hp/laserjet3p.cpp, machine/hp_lj3p.cpp, bus/centronics, bus/rs232: Add HP LaserJet IIIP`. Later commit titles start with `hp_lj3p:`, which isn't a path. The commit that adds the system needs the release-notes heading, e.g. `New working systems` followed by `HP LaserJet IIIP [rfka01, Artiom, Guru]`. The commit bodies could not be seen.
- **[S-4]** CI and `-validate` could not be confirmed. Run both on the contributor's branch before this goes further.

Summary

2 Blocking, 20 Tidy (13 individually and 7 mechanical items folded into per-file lines), 5 Nits, 2 Submission. The single most important fix is **D-10**: don't let the slot cards override the host's layout.