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Agent-Human Workflow Design

This document describes the collaborative workflow between AI agents (via ticker) and humans for task completion in ticks.

Overview

Currently, ticks has a **manual** boolean flag that makes ticker skip tasks entirely. This document proposes a richer model where:

1. Agents can **hand off** tasks to humans for specific reasons (approval, input, review, etc.)
2. Humans can **respond** with a structured verdict (approved/rejected)
3. Ticker **continues working** on other tasks while waiting for human response
4. After human response, the task either **closes** or **returns to agent** with feedback

State Model

Three Enum Fields

```
requires: null | approval | review | content          # pre-declared gate (set at creation, persistent)
awaiting: null | work | approval | input | review | content | escalation | checkpoint # current state
verdict:  null | approved | rejected                  # human response (transient)
```

Requires Field

The **requires** field allows humans to **pre-declare** that a tick needs approval before closing, without relying on agent judgment.

Value	Meaning
null	No pre-declared gate (default)
approval	Must have human sign-off before closing
review	Must have PR review before closing
content	Must have content/design review before closing

Key behavior: When agent signals COMPLETE on a tick with **requires** set, the engine sets **awaiting** to the **requires** value instead of closing the tick.

Awaiting Values

Value	Meaning	Human Action Expected
null	Agent's turn (default)	-
work	Human must do the task	Complete the work
approval	Agent done, needs sign-off	Approve or reject with feedback
input	Agent needs information	Provide answer (in notes)
review	PR needs code review	Review and approve or request changes
content	UI/copy needs human judgment	Judge quality, approve or give feedback
escalation	Agent found issue, needs direction	Decide how to proceed
checkpoint	Phase complete, verify before next	Approve to continue or reject to redo

Verdict Values

Value	Meaning
null	No response yet (default)
approved	Human accepts/approves
rejected	Human rejects, needs changes

Notes

Freeform context (questions, feedback, answers) goes in notes. Notes are **supplementary** - they don't drive state transitions, but provide context for both agent and human.

Workflow Scenarios

1. Approval Gate

Agent completes work but needs human sign-off before closing.

Examples: Security changes, database migrations, API changes

```
sequenceDiagram
    participant A as Agent
    participant T as Tick
    participant H as Human

    A->>T: Complete work
    A->>T: Signal APPROVAL_NEEDED
    Note over T: awaiting=approval
    A->>A: Continue to next task

    H->>T: Review work
    alt Approved
        H->>T: verdict=approved
        Note over T: Tick closed
    else Rejected
        H->>T: verdict=rejected
        H->>T: Add feedback note
        Note over T: awaiting=null, verdict=null
        A->>T: Pick up task again
        A->>A: Read feedback, retry
    end
end
```

2. Input Required

Agent needs information only human can provide.

Examples: Business decisions, configuration choices, clarifications

```
sequenceDiagram
    participant A as Agent
    participant T as Tick
    participant H as Human

    A->>T: Working on task
    A->>T: Signal INPUT_NEEDED + question
    Note over T: awaiting=input
    A->>A: Continue to next task
```

```

H->>T: Read question
alt Can answer
    H->>T: Add answer as note
    H->>T: verdict=approved
    Note over T: awaiting=null, verdict=null
    A->>T: Pick up task again
    A->>A: Read answer, continue
else Cannot answer
    H->>T: verdict=rejected
    Note over T: Tick closed (cannot proceed)
end

```

3. PR Review

Agent creates PR but shouldn't merge without review.

Examples: Any code changes requiring review

```

sequenceDiagram
    participant A as Agent
    participant T as Tick
    participant H as Human

    A->>T: Create PR
    A->>T: Signal REVIEW_REQUESTED + PR URL
    Note over T: awaiting=review
    A->>A: Continue to next task

    H->>T: Review PR
    alt Approved
        H->>T: verdict=approved
        Note over T: Tick closed (PR merged)
    else Changes requested
        H->>T: verdict=rejected
        H->>T: Add feedback note
        Note over T: awaiting=null, verdict=null
        A->>T: Pick up task again
        A->>A: Read feedback, update PR
    end
end

```

4. Content/Design Review

Agent creates UI, copy, or design that needs human judgment.

Examples: Error messages, UI layouts, marketing copy, user-facing text

```

sequenceDiagram
    participant A as Agent
    participant T as Tick
    participant H as Human

    A->>T: Implement UI/copy
    A->>T: Signal CONTENT_REVIEW + description
    Note over T: awaiting=content
    A->>A: Continue to next task

    H->>T: Review content

```

```

alt Approved
  H->>T: verdict=approved
  Note over T: Tick closed
else Needs changes
  H->>T: verdict=rejected
  H->>T: Add feedback note
  Note over T: awaiting=null, verdict=null
  A->>T: Pick up task again
  A->>A: Read feedback, revise
end

```

5. Escalation

Agent discovers something unexpected requiring human decision.

Examples: Security vulnerabilities, scope creep, architectural decisions

```

sequenceDiagram
  participant A as Agent
  participant T as Tick
  participant H as Human

  A->>T: Working on task
  A->>T: Signal ESCALATE + issue description
  Note over T: awaiting=escalation
  A->>A: Continue to next task

  H->>T: Review escalation
  alt Proceed
    H->>T: Add direction as note
    H->>T: verdict=approved
    Note over T: awaiting=null, verdict=null
    A->>T: Pick up task again
    A->>A: Read direction, continue
  else Cancel
    H->>T: verdict=rejected
    Note over T: Tick closed (won't do)
  end
end

```

6. Checkpoint

Large task with intermediate verification points.

Examples: Data migrations, multi-phase refactors

```

sequenceDiagram
  participant A as Agent
  participant T as Tick
  participant H as Human

  A->>T: Complete phase 1
  A->>T: Signal CHECKPOINT + summary
  Note over T: awaiting=checkpoint
  A->>A: Continue to next task

  H->>T: Verify phase 1
  alt Approved

```

```

    H->>T: verdict=approved
    Note over T: awaiting=null, verdict=null
    A->>T: Pick up task again
    A->>A: Continue to phase 2
else Rejected
    H->>T: verdict=rejected
    H->>T: Add feedback note
    Note over T: awaiting=null, verdict=null
    A->>T: Pick up task again
    A->>A: Read feedback, redo phase 1
end

```

7. Human Work (Eject)

Task requires human to complete (not just approve).

Examples: Manual configuration, physical setup, external system access

```

sequenceDiagram
    participant A as Agent
    participant T as Tick
    participant H as Human

    A->>T: Attempt task
    A->>T: Signal EJECT + reason
    Note over T: awaiting=work
    A->>A: Continue to next task

    H->>T: Do the work
    H->>T: verdict=approved
    Note over T: Tick closed

```

8. Pre-Declared Approval Gate

Human knows upfront that a tick needs approval, regardless of agent judgment.

Examples: All security changes, all API changes, all UI work for a specific epic

```

sequenceDiagram
    participant H as Human
    participant T as Tick
    participant A as Agent

    H->>T: Create tick with requires=approval
    Note over T: requires=approval, awaiting=null

    A->>T: Pick up task (tk next returns it)
    A->>A: Work on task
    A->>T: Signal COMPLETE
    Note over T: Engine sees requires=approval
    Note over T: Sets awaiting=approval (not closed)
    A->>A: Continue to next task

    H->>T: Review work
    alt Approved
        H->>T: verdict=approved
        Note over T: Tick closed
    end

```

```

else Rejected
  H->>T: verdict=rejected
  H->>T: Add feedback note
  Note over T: awaiting=null, verdict=null
  Note over T: requires=approval (unchanged)
  A->>T: Pick up task again
  A->>A: Read feedback, retry
  A->>T: Signal COMPLETE
  Note over T: awaiting=approval again
end

```

Key differences from agent-initiated approval: - Human sets **requires** at creation time, not agent at completion time - **requires** persists through rejection cycles (agent can't bypass it) - Agent doesn't need to know or decide whether approval is needed

State Transition Diagram

stateDiagram-v2

```

[*] --> Open: Task created

```

```

Open --> AwaitingHuman: Agent signals handoff

```

```

Open --> AwaitingHuman: Agent COMPLETE + requires set

```

```

state AwaitingHuman {

```

```

    [*] --> work

```

```

    [*] --> approval

```

```

    [*] --> input

```

```

    [*] --> review

```

```

    [*] --> content

```

```

    [*] --> escalation

```

```

    [*] --> checkpoint

```

```

}

```

```

AwaitingHuman --> Closed: verdict=approved (terminal)

```

```

AwaitingHuman --> Open: verdict=rejected OR verdict=approved (non-terminal)

```

```

Open --> Closed: Agent signals COMPLETE (no requires)

```

```

note right of AwaitingHuman

```

```

    Terminal awaiting types (approved = close):

```

```

    - approval

```

```

    - review

```

```

    - content

```

```

    - work

```

```

    Non-terminal awaiting types (approved = back to agent):

```

```

    - input

```

```

    - escalation

```

```

    - checkpoint

```

```

    Pre-declared gates (requires field):

```

```

    - approval, review, content

```

```

    - Triggered on COMPLETE signal

```

```

    - Persists through rejection cycles

```

```

end note

```


Verdict Processing Matrix

awaiting	verdict=approved	verdict=rejected
work	Close tick	(invalid - human couldn't do it?)
approval	Close tick	Back to agent (with feedback)
input	Back to agent (with answer)	Close tick (can't proceed)
review	Close tick (merge PR)	Back to agent (with feedback)
content	Close tick	Back to agent (with feedback)
escalation	Back to agent (with direction)	Close tick (won't do)
checkpoint	Back to agent (next phase)	Back to agent (redo phase)

Agent Signal Protocol

Agents communicate via XML tags in output:

Signal	Tag Format	Sets awaiting
Complete	<code><promise>COMPLETE</promise></code>	- (closes tick)
Eject	<code><promise>EJECT: reason</promise></code>	work
Approval needed	<code><promise>APPROVAL_NEEDED: reason</promise></code>	approval
Input needed	<code><promise>INPUT_NEEDED: question</promise></code>	input
Review requested	<code><promise>REVIEW_REQUESTED: pr_url</promise></code>	review
Content review	<code><promise>CONTENT_REVIEW: description</promise></code>	content
Escalate	<code><promise>ESCALATE: issue</promise></code>	escalation
Checkpoint	<code><promise>CHECKPOINT: summary</promise></code>	checkpoint

The text after the colon is added as a note to provide context.

Ticker Engine Loop

flowchart TD

```
Start([Start]) --> GetNext[tk next epic-id]
GetNext --> HasTask{Task found?}
```

```
HasTask -->|No| Done([Done - no tasks])
HasTask -->|Yes| CheckBudget{Budget OK?}
```

```
CheckBudget -->|No| Done2([Done - budget exhausted])
CheckBudget -->|Yes| RunAgent[Run agent on task]
```

```
RunAgent --> DetectSignal{Detect signal}
```

```
DetectSignal -->|COMPLETE| CloseTick[Close tick]
DetectSignal -->|EJECT| SetWork[awaiting=work + note]
DetectSignal -->|APPROVAL_NEEDED| SetApproval[awaiting=approval + note]
```

```

DetectSignal -->|INPUT_NEEDED| SetInput[awaiting=input + note]
DetectSignal -->|REVIEW_REQUESTED| SetReview[awaiting=review + note]
DetectSignal -->|CONTENT_REVIEW| SetContent[awaiting=content + note]
DetectSignal -->|ESCALATE| SetEscalation[awaiting=escalation + note]
DetectSignal -->|CHECKPOINT| SetCheckpoint[awaiting=checkpoint + note]
DetectSignal -->|No signal| Continue[Continue iteration or next task]

CloseTick --> GetNext
SetWork --> GetNext
SetApproval --> GetNext
SetInput --> GetNext
SetReview --> GetNext
SetContent --> GetNext
SetEscalation --> GetNext
SetCheckpoint --> GetNext
Continue --> GetNext

```

Key behavior: Ticker **never blocks** on human. After any handoff signal, it immediately proceeds to the next available task.

Implementation: Changes to Ticks (tk CLI)

Schema Changes

New Fields

Add to tick schema:

```

type Tick struct {
    // ... existing fields ...

    // Requires declares a gate that must be passed before closing
    // Set at creation time, persists through the tick lifecycle
    Requires *string `json:"requires,omitempty"` // approval/review/content

    // Awaiting indicates the tick is waiting for human action
    // null means agent's turn, any other value means human's turn
    Awaiting *string `json:"awaiting,omitempty"` // work/approval/input/review/content/escalation/checkpoint

    // Verdict is the human's response to an awaiting state
    // Processed immediately when set, then cleared
    Verdict *string `json:"verdict,omitempty"` // approved/rejected
}

```

Deprecate Manual Field

The manual field is superseded by awaiting=work:

```

// Deprecated: Use Awaiting="work" instead
Manual bool `json:"manual,omitempty"`

```

Migration: manual: true → awaiting: "work"

CLI Changes

New Flags

```
# Create with pre-declared approval gate
tk create "Security-sensitive task" --requires approval
tk create "UI redesign" --requires content
tk create "API change" --requires review

# Create with awaiting (immediate human assignment)
tk create "Task title" --awaiting work

# Update awaiting
tk update <id> --awaiting approval
tk update <id> --awaiting=null # clear, return to agent

# Set verdict
tk update <id> --verdict approved
tk update <id> --verdict rejected
```

New Filter Options

```
# List tasks awaiting human
tk list --awaiting # all awaiting != null
tk list --awaiting approval # specific type
tk list --awaiting input,review # multiple types

# Ready excludes awaiting (like it excludes manual)
tk ready # awaiting=null AND not blocked AND open
```

Shorthand Commands

```
# Approve (verdict=approved, triggers processing)
tk approve <id>

# Reject with optional feedback note
tk reject <id>
tk reject <id> "Needs softer error messages"
```

Note Author Flag

```
# Agent note (default, or explicit)
tk note <id> "PR ready: github.com/..."
tk note <id> "Context info" --from agent

# Human note (feedback, answers)
tk note <id> "Use Stripe for payments" --from human
```

Verdict Processing Logic

When verdict is set, tk processes immediately:

```
func processVerdict(tick *Tick) error {
    if tick.Verdict == nil || tick.Awaiting == nil {
        return nil
    }
}
```

```

shouldClose := false

switch *tick.Awaiting {
case "work":
    // Human completed work
    shouldClose = (*tick.Verdict == "approved")
case "approval", "review", "content":
    // Terminal states - approved means done
    shouldClose = (*tick.Verdict == "approved")
case "input":
    // Approved = answer provided, continue; Rejected = can't proceed
    shouldClose = (*tick.Verdict == "rejected")
case "escalation":
    // Approved = direction given, continue; Rejected = won't do
    shouldClose = (*tick.Verdict == "rejected")
case "checkpoint":
    // Never closes - always back to agent
    shouldClose = false
}

// Clear state
tick.Awaiting = nil
tick.Verdict = nil

if shouldClose {
    tick.Status = "closed"
}

return saveTick(tick)
}

```

Query Changes

tk next

Exclude tasks with awaiting set:

```

func getNextTask(epicID string) *Tick {
    // Existing filters: open, not blocked, not manual
    // Add: awaiting == null

    tasks := listTasks(epicID)
    for _, t := range tasks {
        if t.Status == "open" &&
            !t.isBlocked() &&
            t.Awaiting == nil { // NEW
            return &t
        }
    }
    return nil
}

```

tk ready

Same filter - exclude awaiting:

```
tk ready # only shows awaiting=null tasks
```

Implementation: Changes to Ticker (Engine)

Signal Detection

Extend Signal Parsing

Current signals: - COMPLETE - EJECT - BLOCKED

New signals to detect:

```
type Signal string

const (
    SignalComplete      Signal = "COMPLETE"
    SignalEject          Signal = "EJECT"
    SignalBlocked        Signal = "BLOCKED"           // Legacy, maps to input
    SignalApprovalNeeded Signal = "APPROVAL_NEEDED"
    SignalInputNeeded    Signal = "INPUT_NEEDED"
    SignalReviewRequested Signal = "REVIEW_REQUESTED"
    SignalContentReview  Signal = "CONTENT_REVIEW"
    SignalEscalate       Signal = "ESCALATE"
    SignalCheckpoint     Signal = "CHECKPOINT"
)

// ParseSignal extracts signal from agent output
func ParseSignal(output string) (Signal, string) {
    // Match <promise>SIGNAL_TYPE: context</promise>
    // or <promise>SIGNAL_TYPE</promise>

    re := regexp.MustCompile(`<promise>(\w+)(?:\s*(.+?))?</promise>`)
    matches := re.FindStringSubmatch(output)
    if matches == nil {
        return "", ""
    }
    return Signal(matches[1]), strings.TrimSpace(matches[2])
}
```

Signal Handling

Map Signals to Awaiting

```
func (e *Engine) handleSignal(tick *Tick, signal Signal, context string) error {
    switch signal {
    case SignalComplete:
        // Check for pre-declared approval gate
        if tick.Requires != "" {
            return e.setAwaiting(tick, tick.Requires, "Work complete, requires "+tick.Requires)
        }
        return e.ticks.Close(tick.ID, "Completed by agent")
    }
```

```

    case SignalEject:
        return e.setAwaiting(tick, "work", context)

    case SignalBlocked:
        // Legacy signal - treat as input needed
        return e.setAwaiting(tick, "input", context)

    case SignalApprovalNeeded:
        return e.setAwaiting(tick, "approval", context)

    case SignalInputNeeded:
        return e.setAwaiting(tick, "input", context)

    case SignalReviewRequested:
        return e.setAwaiting(tick, "review", context)

    case SignalContentReview:
        return e.setAwaiting(tick, "content", context)

    case SignalEscalate:
        return e.setAwaiting(tick, "escalation", context)

    case SignalCheckpoint:
        return e.setAwaiting(tick, "checkpoint", context)
}
return nil
}

func (e *Engine) setAwaiting(tick *Tick, awaiting, context string) error {
    // Update tick awaiting status
    if err := e.ticks.Update(tick.ID, "--awaiting", awaiting); err != nil {
        return err
    }

    // Add context as note
    if context != "" {
        if err := e.ticks.Note(tick.ID, context); err != nil {
            return err
        }
    }

    return nil
}

```

Loop Changes

Non-Blocking on Handoff

```

func (e *Engine) Run(epicID string) error {
    for {
        // Check budget
        if e.budget.Exhausted() {
            return ErrBudgetExhausted
        }
    }
}

```

```

    // Get next available task
    tick, err := e.ticks.Next(epicID)
    if err != nil {
        return err
    }
    if tick == nil {
        // No tasks available (all done or awaiting human)
        return nil
    }

    // Build context (include recent notes for feedback)
    context := e.buildContext(tick)

    // Run agent
    output, err := e.agent.Run(tick, context)
    if err != nil {
        return err
    }

    // Detect and handle signal
    signal, signalContext := ParseSignal(output)
    if signal != "" {
        if err := e.handleSignal(tick, signal, signalContext); err != nil {
            return err
        }
        // IMPORTANT: Continue to next task, don't block
        continue
    }

    // No signal - check iteration limits, continue or pause
    // ... existing logic ...
}
}

```

Context Building

Include recent notes when returning to a task after human feedback:

```

func (e *Engine) buildContext(tick *Tick) string {
    var context strings.Builder

    // Get recent notes
    notes, _ := e.ticks.Notes(tick.ID)

    // Check if there's human feedback (from recent verdict processing)
    humanNotes := filterHumanNotes(notes)
    if len(humanNotes) > 0 {
        context.WriteString("## Human Feedback\n\n")
        context.WriteString("This task was previously handed to a human. Their response:\n\n")
        for _, note := range humanNotes {
            context.WriteString(fmt.Sprintf("- %s\n", note.Content))
        }
        context.WriteString("\nAddress this feedback before proceeding.\n\n")
    }
}

```

```
    return context.String()
}
```

Agent Prompt Updates

System Prompt Addition

Add to agent system prompt:

Handoff Signals

When you need human involvement, emit a signal and the system will hand off the task:

Signal	When to Use
<code><promise>COMPLETE</promise></code>	Task fully done
<code><promise>APPROVAL_NEEDED: reason</promise></code>	Work complete, needs human sign-off (security, migration, etc)
<code><promise>INPUT_NEEDED: question</promise></code>	Need human to answer a question or make a decision
<code><promise>REVIEW_REQUESTED: pr_url</promise></code>	PR created, needs code review
<code><promise>CONTENT_REVIEW: description</promise></code>	UI/copy/design needs human judgment
<code><promise>ESCALATE: issue</promise></code>	Found unexpected issue requiring human direction
<code><promise>CHECKPOINT: summary</promise></code>	Completed a phase, need verification before continuing
<code><promise>EJECT: reason</promise></code>	Cannot complete - requires human to do the work

After emitting a handoff signal, the system will move to another task. When a human responds, you may be prompted to provide more information.

Reading Human Feedback

If this task was previously handed off, check the "Human Feedback" section above for the human's response.

Migration Path

Phase 1: Add Fields to Ticks

1. Add `awaiting` and `verdict` fields to schema
2. Add CLI flags (`--awaiting`, `--verdict`)
3. Add `tk approve` and `tk reject` commands
4. Update `tk next` and `tk ready` to exclude `awaiting`
5. Keep `manual` field working (deprecated but functional)

Phase 2: Update Ticker Engine

1. Add new signal detection
2. Add signal → `awaiting` mapping
3. Change loop to continue after handoff signals
4. Add context building with human feedback

Phase 3: Deprecate Manual

1. Migrate existing `manual: true` ticks to `awaiting: work`
2. Remove `--manual` flag (or alias to `--awaiting work`)
3. Update documentation

Future Considerations

Notification System

How does human know there's work waiting?

- CLI: `tk list --awaiting` in a watch loop
- Integration: Slack/email notifications
- Dashboard: Web UI showing pending items

Timeout Handling

What if human doesn't respond?

- Auto-escalate after N days?
- Notify/remind?
- Allow agent to retry with different approach?

Reviewer Routing

Different humans for different review types:

```
awaiting: content
reviewer: design # optional field for routing
```

Audit Trail

Track handoff history:

```
handoff_history: [
  { signal: "APPROVAL_NEEDED", timestamp: "...", context: "..." },
  { verdict: "rejected", timestamp: "...", feedback: "..." },
  { signal: "APPROVAL_NEEDED", timestamp: "...", context: "..." },
  { verdict: "approved", timestamp: "..." }
]
```

LLM/Agent Workflow Instructions

This section provides detailed instructions for LLMs operating as agents within the ticker system. These instructions should be included in agent system prompts and ticker skill definitions.

Agent System Prompt (for ticker)

Include this in the agent's system prompt:

```
# Ticker Task Execution
```

```
You are working on tasks managed by the ticker system. Each task comes from a tick (issue) in the ticks
```

```
## Completing Tasks
```

```
When you finish a task, emit one of these signals:
```

Task Complete

If you have fully completed the task with no issues:

`<promise>COMPLETE</promise>`

Need Human Approval

If the work is done but should be reviewed before closing (security changes, migrations, API changes):

`<promise>APPROVAL_NEEDED: Brief description of what needs approval</promise>`

Need Human Input

If you need information or a decision from a human to proceed:

`<promise>INPUT_NEEDED: Your specific question here</promise>`

PR Ready for Review

If you created a pull request that needs code review:

`<promise>REVIEW_REQUESTED: https://github.com/org/repo/pull/123</promise>`

Content Needs Review

If you created UI, copy, or design work that needs human judgment:

`<promise>CONTENT_REVIEW: Description of what to review (e.g., "New error messages in PaymentForm")</promise>`

Found Unexpected Issue

If you discovered something that needs human decision (security issue, scope creep, architectural choice):

`<promise>ESCALATE: Description of the issue and options</promise>`

Checkpoint (Multi-Phase Work)

If you completed a phase and need verification before continuing:

`<promise>CHECKPOINT: Summary of completed phase and what's next</promise>`

Cannot Complete (Human Must Do It)

If the task requires human action (credentials, physical setup, external access):

`<promise>EJECT: Reason why human must do this</promise>`

Reading Human Feedback

When you pick up a task, check the notes for human feedback. If you see notes marked as human feedback:

1. Read and understand the feedback
2. Address all points raised
3. Then proceed with the task

Pre-Declared Gates

Some tasks have ``requires`` set (e.g., ``requires: approval``). You don't need to handle this - just signal

Important Rules

1. ****One signal per task**** - Emit exactly one signal when done
2. ****Be specific**** - Include helpful context after the colon
3. ****Don't guess**** - If you need human input, ask via INPUT_NEEDED
4. ****Don't skip gates**** - If something feels like it needs approval, use APPROVAL_NEEDED

Ticker Skill Definition

For LLM orchestration systems that use skill/tool definitions:

```

name: ticker
description: |
  Ticker orchestrates AI agents to complete tasks from the ticks issue tracker.
  The agent works on tasks sequentially, signaling completion or handoff to humans.

signals:
  COMPLETE:
    description: Task fully completed, close the tick
    format: "<promise>COMPLETE</promise>"

  APPROVAL_NEEDED:
    description: Work done but needs human sign-off before closing
    format: "<promise>APPROVAL_NEEDED: reason</promise>"
    when_to_use:
      - Security-sensitive changes
      - Database migrations
      - API contract changes
      - Dependency major version upgrades
      - Anything with significant risk

  INPUT_NEEDED:
    description: Agent needs information or decision from human
    format: "<promise>INPUT_NEEDED: question</promise>"
    when_to_use:
      - Business logic decisions
      - Configuration choices
      - Clarification on requirements
      - "Which X should I use?" questions

  REVIEW_REQUESTED:
    description: PR created, needs code review
    format: "<promise>REVIEW_REQUESTED: pr_url</promise>"
    when_to_use:
      - After creating any pull request
      - Include full PR URL

  CONTENT_REVIEW:
    description: UI, copy, or design needs human judgment
    format: "<promise>CONTENT_REVIEW: description</promise>"
    when_to_use:
      - User-facing text changes
      - UI component styling
      - Error messages
      - Marketing copy
      - Anything subjective

  ESCALATE:
    description: Unexpected issue found, needs human direction
    format: "<promise>ESCALATE: issue</promise>"
    when_to_use:
      - Security vulnerabilities discovered
      - Scope larger than expected
      - Architectural decisions needed
      - Conflicting requirements

```

```

CHECKPOINT:
  description: Phase complete, verify before next phase
  format: "<promise>CHECKPOINT: summary</promise>"
  when_to_use:
    - Multi-phase migrations
    - Large refactors (verify approach on one module)
    - Any work where early validation saves rework

EJECT:
  description: Task requires human to complete
  format: "<promise>EJECT: reason</promise>"
  when_to_use:
    - Needs credentials agent doesn't have
    - Physical or manual setup required
    - External system access needed
    - Agent genuinely cannot do it

workflow:
  on_task_start:
    - Read task description from tick
    - Check notes for human feedback (if returning to task)
    - Address any feedback before proceeding

  on_task_complete:
    - Emit exactly one signal
    - Include helpful context
    - System routes to next task or human

human_feedback:
  location: tick notes (marked with --from human)
  when_present:
    - Previous handoff was rejected
    - Human provided requested input
    - Human gave direction on escalation
  action: Address all feedback points before proceeding

```

CLI Help Text Examples

ticks (tk) CLI Help

tk create

tk create - Create a new tick

USAGE:

tk create <title> [flags]

FLAGS:

-d, --description string	Tick description
-t, --type string	Tick type: task, epic (default "task")
-p, --priority int	Priority: 0=critical, 1=high, 2=medium, 3=low, 4=backlog (default 2)
-l, --labels string	Comma-separated labels

--parent string	Parent epic ID
--blocked-by string	ID of blocking tick
--requires string	Pre-declared approval gate: approval, review, content Tick will route to human after agent completes
--awaiting string	Immediate human assignment: work, approval, input, review, content, escalation Tick will be skipped by agent until human responds
--manual	[DEPRECATED] Use --awaiting=work instead

EXAMPLES:

```
# Simple task
tk create "Fix login bug" -d "Users can't login with SSO"

# Task requiring approval before closing
tk create "Update auth flow" --requires approval

# Task requiring content review (UI/copy)
tk create "Redesign error messages" --requires content

# Task assigned directly to human
tk create "Configure AWS credentials" --awaiting work

# Task under an epic
tk create "Implement payment API" --parent epic-123
```

tk approve / tk reject

tk approve - Approve a tick awaiting human verdict

USAGE:

```
tk approve <id>
```

DESCRIPTION:

Sets verdict=approved on the tick. Depending on the awaiting type:

- approval, review, content, work: Closes the tick
- input, escalation, checkpoint: Returns tick to agent queue

EXAMPLES:

```
tk approve abc123
```

tk reject - Reject a tick awaiting human verdict

USAGE:

```
tk reject <id> [feedback]
```

DESCRIPTION:

Sets verdict=rejected on the tick. Adds optional feedback as a human note.
Tick returns to agent queue (or closes for input/escalation rejection).

EXAMPLES:

```
tk reject abc123
```

```
tk reject abc123 "Error messages too harsh, soften the tone"
```

tk list --awaiting

tk list - List ticks

USAGE:

```
tk list [flags]
```

FLAGS:

```
--awaiting [type]    Filter by awaiting status
                       No value: all ticks awaiting human
                       With value: specific type(s), comma-separated
```

EXAMPLES:

```
# All ticks awaiting human action
tk list --awaiting

# Only ticks awaiting approval
tk list --awaiting approval

# Ticks awaiting approval or review
tk list --awaiting approval,review

# Show what needs your attention
tk list --awaiting --json | jq '.[[] | {id, title, awaiting}]'
```

tk next --awaiting

tk next - Get next task to work on

USAGE:

```
tk next [epic-id] [flags]
```

FLAGS:

```
--awaiting [type]    Get next task awaiting human (instead of agent)
                       No value: any awaiting type
                       With value: specific type(s), comma-separated
```

DESCRIPTION:

```
Without --awaiting: Returns next task for agent (awaiting=null, not blocked, open)
With --awaiting: Returns next task for human (awaiting!=null)
```

Tasks are returned in priority order (lowest priority number first).

EXAMPLES:

```
# Agent's next task
tk next epic-123

# Human's next task (any type)
tk next epic-123 --awaiting

# Human's next approval to review
tk next epic-123 --awaiting approval
```

```
# Human's next content or review task
tk next epic-123 --awaiting content,review

# Human's next task across all epics
tk next --awaiting
```

tk note

tk note - Add a note to a tick

USAGE:

```
tk note <id> <message> [flags]
```

FLAGS:

```
--from string    Note author: agent, human (default "agent")
```

DESCRIPTION:

Notes provide context for agent-human handoffs:

- Agent notes: Context about work, questions, PR links
- Human notes: Feedback, answers, direction

The --from flag helps distinguish note sources for the agent.

EXAMPLES:

```
# Agent adding context
tk note abc123 "PR ready: https://github.com/org/repo/pull/456"

# Human providing feedback (after rejection)
tk note abc123 "Use friendlier language in error messages" --from human

# Human answering a question
tk note abc123 "Use Stripe for payment processing" --from human
```

ticker CLI Help

ticker run

ticker run - Run the ticker engine on an epic

USAGE:

```
ticker run <epic-id> [flags]
ticker run --auto [flags]
```

FLAGS:

```
--headless      Run without TUI
--auto          Auto-select next ready epic
--max-iterations Maximum iterations per task (default 10)
--max-cost       Maximum cost in dollars (default 10.0)
```

DESCRIPTION:

Ticker runs AI agents on tasks within an epic. The engine:

1. Gets next available task (tk next)
2. Runs agent on task
3. Detects agent signal (COMPLETE, APPROVAL_NEEDED, etc.)

4. Updates tick state accordingly
5. Continues to next task (never blocks on human)

AGENT SIGNALS:

COMPLETE	Task done, close tick
APPROVAL_NEEDED	Work done, needs human sign-off
INPUT_NEEDED	Agent needs information from human
REVIEW_REQUESTED	PR needs code review
CONTENT_REVIEW	UI/copy needs human judgment
ESCALATE	Found issue, needs human direction
CHECKPOINT	Phase done, needs verification
EJECT	Agent can't do it, human must

TASK FILTERING:

Ticker skips tasks where:

- awaiting is set (waiting for human)
- blocked by another task
- status is closed

HUMAN WORKFLOW:

While ticker runs, humans can:

- tk next --awaiting Get next task needing human attention
- tk list --awaiting See all tasks needing attention
- tk approve <id> Approve completed work
- tk reject <id> "reason" Reject with feedback

Approved/rejected tasks return to the queue for ticker to pick up.

EXAMPLES:

```
# Run on specific epic
ticker run epic-abc123

# Run headless (CI/automation)
ticker run epic-abc123 --headless

# Auto-select next epic
ticker run --auto
```

Watch Mode and Idle Behavior

Problem

When ticker runs in `--auto` mode and exhausts all available tasks (all awaiting human or done), it currently exits. With the agent-human workflow, ticker should **wait** for tasks to become available again.

Watch Mode Design

```
ticker run --auto --watch
```

Behavior: 1. Process all available tasks 2. When no tasks available, enter idle/watch state 3. Poll for changes (or use file system watcher on `.tick/`) 4. When task becomes available, resume processing 5. Exit only on explicit quit, budget exhaustion, or `--timeout`


```

flowchart TD
    Start([Start]) --> GetNext[Get next task]
    GetNext --> HasTask{Task found?}

    HasTask -->|Yes| RunAgent[Run agent]
    RunAgent --> GetNext

    HasTask -->|No| WatchMode{Watch mode?}

    WatchMode -->|No| Exit([Exit])
    WatchMode -->|Yes| Idle[Enter idle state]

    Idle --> Poll[Poll for changes]
    Poll --> Changed{Tasks available?}

    Changed -->|No| CheckTimeout{Timeout?}
    CheckTimeout -->|No| Poll
    CheckTimeout -->|Yes| Exit

    Changed -->|Yes| GetNext

```

CLI Flags

```

ticker run --auto --watch           # Watch indefinitely
ticker run --auto --watch --timeout 1h # Watch with timeout
ticker run --auto --watch --poll 5s   # Custom poll interval (default 10s)

```

Race Condition Prevention

Problem

When a human responds to a tick, they might make multiple edits:

```

tk reject abc123           # Clear awaiting
tk note abc123 "feedback" --from human # Add feedback

```

If ticker picks up the task between these commands, the agent won't see the feedback note.

Solutions

Option A: Atomic Commands (Recommended)

Make `tk reject` and `tk approve` include note in single operation:

```

tk reject abc123 "feedback" # Sets verdict + adds note atomically

```

This is already in the design. The note is added **before** the verdict is processed.

Option B: Debounce

Ticker waits a short period after a task becomes available before picking it up:

```

func (e *Engine) getNextTask() *Tick {
    tick := e.ticks.Next(epicID)
    if tick == nil {
        return nil
    }
}

```

```

}

// Wait for potential follow-up edits
time.Sleep(2 * time.Second)

// Re-fetch to get any updates
return e.ticks.Get(tick.ID)
}

```

Downside: Adds latency to all task pickups.

Option C: Explicit Release

Human must explicitly release task back to agent:

```

tk reject abc123 "feedback"    # Sets verdict, but awaiting stays set
tk release abc123              # Now clears awaiting

```

Downside: Extra step for humans, easy to forget.

Recommendation

Use **Option A** (atomic commands) as primary mechanism: - `tk reject <id> "feedback"` is a single atomic operation - Note is added first, then verdict processed - No race window

Add **Option B** (debounce) as defense-in-depth: - Short debounce (1-2 seconds) on task pickup - Configurable: `ticker run --debounce 2s` - Catches edge cases like slow file system sync

Orphaned Ticks and Auto Mode

Problem

Currently, `tk next <epic-id>` only returns tasks within a specific epic. But what about: - Standalone ticks (no parent epic) - Ticks orphaned from their epic (epic closed but tasks remain)

Auto Mode Scope

Current Behavior

```

ticker run --auto # Picks next ready epic, runs tasks within it

```

Proposed Enhancement

Auto mode should also consider: 1. **Epics with ready tasks** (current behavior) 2. **Standalone tasks** (no parent epic, not awaiting) 3. **Orphaned tasks** (parent epic closed, task still open)

Priority Order

1. Active epics with in-progress work (continue momentum)
2. Epics with ready tasks (start new epic work)
3. Standalone tasks (housekeeping)
4. Orphaned tasks (cleanup)

Implementation

```
func (e *Engine) getNextWork() (*Epic, *Tick) {
    // 1. Check current epic (if any) for more tasks
    if e.currentEpic != nil {
        if tick := e.ticks.Next(e.currentEpic.ID); tick != nil {
            return e.currentEpic, tick
        }
    }

    // 2. Find epics with ready tasks
    epics := e.ticks.ListEpics(WithReadyTasks())
    if len(epics) > 0 {
        epic := epics[0] // Could sort by priority
        tick := e.ticks.Next(epic.ID)
        return epic, tick
    }

    // 3. Find standalone tasks (no parent)
    standalones := e.ticks.List(NoParent(), Ready())
    if len(standalones) > 0 {
        return nil, standalones[0]
    }

    // 4. Find orphaned tasks (parent closed)
    orphans := e.ticks.List(ParentClosed(), Ready())
    if len(orphans) > 0 {
        return nil, orphans[0]
    }

    return nil, nil
}
```

CLI Support

```
# Current: only epics
ticker run --auto

# With standalone/orphan support
ticker run --auto --include-standalone # Include tasks without parent
ticker run --auto --include-orphans    # Include tasks with closed parent
ticker run --auto --all                 # Include everything
```

tk next Enhancement

```
# Get next task across all epics and standalone
tk next # Next task (any epic or standalone)
tk next --epic epic-123 # Next task in specific epic
tk next --standalone # Next standalone task only
tk next --orphan # Next orphaned task only
```

Implementation Checklist

ticks (tk CLI)

- ☐ Add `requires` field to tick schema
- ☐ Add `awaiting` field to tick schema
- ☐ Add `verdict` field to tick schema
- ☐ Add `--requires` flag to `tk create` and `tk update`
- ☐ Add `--awaiting` flag to `tk create` and `tk update`
- ☐ Add `--verdict` flag to `tk update`
- ☐ Add `tk approve` command
- ☐ Add `tk reject` command
- ☐ Add `--from` flag to `tk note`
- ☐ Add `--awaiting` filter to `tk list`
- ☐ Update `tk next` to exclude `awaiting != null` (agent mode)
- ☐ Add `tk next --awaiting` for human mode
- ☐ Update `tk ready` to exclude `awaiting != null`
- ☐ Implement verdict processing logic
- ☐ Deprecate `--manual` flag (alias to `--awaiting work`)
- ☐ Update help text with workflow examples

ticks (tk CLI) - Orphaned/Standalone Support

- ☐ Add `tk next` without `epic-id` (search all)
- ☐ Add `--epic` flag to `tk next` for specific epic
- ☐ Add `--standalone` flag to filter tasks without parent
- ☐ Add `--orphan` flag to filter tasks with closed parent
- ☐ Add parent status tracking (is parent closed?)

ticker (Engine)

- ☐ Add new signal parsing (`APPROVAL_NEEDED`, `INPUT_NEEDED`, etc.)
- ☐ Implement `signal` → `awaiting` mapping
- ☐ Handle `requires` field on `COMPLETE` signal
- ☐ Update loop to continue after handoff signals
- ☐ Build context with human feedback notes
- ☐ Update agent system prompt with signal documentation
- ☐ Update CLI help text with workflow documentation

ticker (Watch Mode)

- ☐ Add `--watch` flag to enable watch mode
- ☐ Implement idle state when no tasks available
- ☐ Add polling/file watching for `.tick/` changes
- ☐ Add `--timeout` flag for watch duration limit
- ☐ Add `--poll` flag for custom poll interval
- ☐ Resume processing when tasks become available

ticker (Race Condition Prevention)

- ☐ Ensure `tk reject` adds note before processing verdict
- ☐ Add optional debounce on task pickup (`--debounce`)
- ☐ Re-fetch task after debounce to get latest state

ticker (Orphaned/Standalone Support)

- ☐ Add `--include-standalone` flag to auto mode
- ☐ Add `--include-orphans` flag to auto mode
- ☐ Add `--all` flag (alias for both)
- ☐ Implement priority order (epics > standalone > orphans)
- ☐ Track current epic for momentum continuation