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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

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

### Verdict Values

Value	Meaning
<b>null</b>	No response yet (default)
<b>approved</b>	Human accepts/approves
<b>rejected</b>	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

```

## 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
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

```

#### 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
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

```

## 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
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
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	<promise>COMPLETE</promise>	- (closes tick)
Eject	<promise>EJECT: reason</promise>	work
Approval needed	<promise>APPROVAL_NEEDED: reason</promise>	approval
Input needed	<promise>INPUT_NEEDED: question</promise>	input



Signal	Tag Format	Sets awaiting
Review requested	<promise>REVIEW_REQUESTED: pr_url</promise>	review
Content review	<promise>CONTENT_REVIEW: description</promise>	content
Escalate	<promise>ESCALATE: issue</promise>	escalation
Checkpoint	<promise>CHECKPOINT: summary</promise>	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/check

    // 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>&lt;promise&gt;COMPLETE&lt;/promise&gt;</code>	Task fully done
<code>&lt;promise&gt;APPROVAL_NEEDED: reason&lt;/promise&gt;</code>	Work complete, needs human sign-off (security, migration, etc)
<code>&lt;promise&gt;INPUT_NEEDED: question&lt;/promise&gt;</code>	Need human to answer a question or make a decision
<code>&lt;promise&gt;REVIEW_REQUESTED: pr_url&lt;/promise&gt;</code>	PR created, needs code review
<code>&lt;promise&gt;CONTENT_REVIEW: description&lt;/promise&gt;</code>	UI/copy/design needs human judgment
<code>&lt;promise&gt;ESCALATE: issue&lt;/promise&gt;</code>	Found unexpected issue requiring human direction
<code>&lt;promise&gt;CHECKPOINT: summary&lt;/promise&gt;</code>	Completed a phase, need verification before continuing
<code>&lt;promise&gt;EJECT: reason&lt;/promise&gt;</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

**## 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
```

---

## 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

### 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