PSEDYS | TECHNICAL REFERENCE MANUAL V3.0

KC — Keltner Channel

KC — Keltner Channel

Technical Reference Manual v1.0

PSEDYS | Complete Edition
EMA ± mult×ATR · Squeeze BB vs KC · Walk the Channel · Trend Filter · MTF · Bot vs TradingView

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1. What is KC? Concept and Origin

Keltner Channel was created by **Chester Keltner** in 1960 and later refined by **Linda Bradford Raschke** into its modern form. KC places bands at ±mult×ATR relative to EMA, combining trend (EMA) with absolute volatility (ATR).

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Difference from BB: KC uses ATR (absolute range H/L/PC) and EMA (reactive), while BB uses StdDev (deviation of Close from average) and SMA. Result: KC is smoother and less sensitive to volatility spikes.

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2. Calculation Formula — Complete

2.1 Middle = EMA(Close, N)

```
K = 2 / (period + 1)
EMA[period-1] = SMA(Close[0..period-1])   ← seed
EMA[i] = Close[i] × K + EMA[i-1] × (1-K)
```

Standard period: 20

2.2 ATR(14) Wilder

```
TR[i] = max(H[i]-L[i], |H[i]-Close[i-1]|, |L[i]-Close[i-1]|)
ATR[14] = SMA(TR[1..14])   ← seed
ATR[i]  = TR[i]/14 + ATR[i-1]×(13/14)    ← Wilder K=1/14
```

2.3 Upper and Lower Channel

```
Upper[i] = EMA[i] + mult × ATR[i]
Lower[i] = EMA[i] − mult × ATR[i]
```

Standard mult: 2.0 (variants: 1.5, 2.5)

2.4 Complete Numeric Example — period=20, mult=2.0, ATR=14

First KC value: bar 20 (max(EMA warm-up=20, ATR warm-up=15))

```
EMA[20]   = 101.6235  (seed SMA bars 1-20 + recursive)
ATR[20]   = 1.4893    (seed SMA bars 1-14 + recursive 5 bars)

Upper[20] = 101.6235 + 2.0 × 1.4893 = 104.6021
Lower[20] = 101.6235 − 2.0 × 1.4893 = 98.6449
```

KC Table bars 20–50 (selection):

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Bar	EMA(Middle)	ATR	Upper	Lower	Width
20	101.624	1.489	104.602	98.645	5.957
25	102.789	1.541	105.871	99.706	6.164
30	103.543	1.515	106.573	100.514	6.059
35	104.004	1.583	107.170	100.838	6.332
40	104.977	1.625	108.226	101.728	6.498
45	106.529	1.543	109.615	103.444	6.171
50	107.923	1.590	111.102	104.743	6.359

3. KC vs BB — Critical Differences

Aspect	KC	BB
Middle	EMA (reactive)	SMA (slow)
Width	mult × ATR (absolute range)	K × StdDev (Close deviation)
Reaction to Close spike	Minimal (ATR smoothed Wilder)	Immediate (StdDev spikes)
Reaction to gap	Yes (TR includes gap)	Not directly (only Close)
Channels	Smoother, more stable	More volatile, widen abruptly
Squeeze detection	BB narrower than KC	KC wider than BB

Combined Squeeze (John Carter method):

```
Active Squeeze: Lower_BB > Lower_KC AND Upper_BB < Upper_KC
  (BB narrower than KC → extreme compression → imminent explosion)

Squeeze ended: BB exits KC
  → Direction: first bar with Close > Upper_KC = Long
               first bar with Close < Lower_KC = Short
```

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4. Lag and Warm-up

```
EMA(20) warm-up: 20 bars
ATR(14) warm-up: 15 bars (seed at bar 15)
First KC value: bar max(20, 15) = bar 20
Lag EMA: (20-1)/2 = 9.5 bars
Lag ATR: ~14 bars (Wilder slow)
KC dominant lag: ~14 bars (ATR)
```

5. Trading Signals

5.1 Walk the Channel (Trend)

```
Bullish trend: Close > Upper consecutively (walk the upper channel)
  → NO Short at touch; confirm active trend
  → SL below EMA (Middle)

Bearish trend: Close < Lower consecutively
  → NO Long; riding short
  → SL above EMA
```

5.2 Squeeze KC+BB

```
Step 1: Detect squeeze (BB < KC)
Step 2: Wait for first close outside KC after squeeze
  Close > Upper_KC: entry Long
  Close < Lower_KC: entry Short
Step 3: SL on opposite side of KC
Step 4: TP at 2×KC width or trailing ATR
```

5.3 Reversal at Bands (Range)

```
Sideways market (ADX < 20):
  Close touches Lower_KC + RSI < 35 → Long with TP at EMA
  Close touches Upper_KC + RSI > 65 → Short with TP at EMA
```

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5.4 Combined Filters

```
# Trend filter
bullish_trend = close > kc_upper        # walk the upper channel
bearish_trend = close < kc_lower        # walk the lower channel
neutral_range = kc_lower < close < kc_upper

# Entry pullback
entry_pullback_long = (
    ema_stack_4h_bullish and
    close < kc_mid and close > kc_lower and  # pullback towards lower but not breach
    rsi < 45 and
    adx > 20
)
```

6. KC in Sideways and Trending Markets

Sideways: EMA flat, parallel and narrow bands. Reversal trading at bands with RSI confirmation.

Bullish trend: EMA inclines bullish. Consistent Close above EMA. Walk the upper channel. SL = EMA or Lower channel.

Bearish trend: EMA inclines bearish. Walk the lower channel. SL = EMA or Upper channel.

7. MTF

Level	Timeframe	KC Usage
Macro	4H	Trend identification (Close relative to EMA/Upper/Lower)
Meso	1H	Squeeze detection; pullback to EMA entry
Entry	5M	Squeeze breakout confirmation

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8. PSEDYS — KC as Trend and Volatility Filter

```
# Trend position
above_upper = close > kc_upper          # strong bullish trend
below_lower = close < kc_lower          # strong bearish trend
inside_channel = kc_lower < close < kc_upper

# Squeeze filter
squeeze_on = (lower_bb > lower_kc) and (upper_bb < upper_kc)

# Entry filter
entry_long_ok = (
    close > kc_mid and              # above EMA
    close < kc_upper and            # not in extreme OB
    not squeeze_on                  # not in squeeze (unclear direction)
)
```

9. Bot vs TradingView Validation

```
□ Middle = EMA(Close, period), NOT SMA
□ ATR = Wilder RMA(TR, atr_period), K=1/N
□ Upper = EMA + mult × ATR
□ Lower = EMA − mult × ATR
□ First KC value: max(ema_warmup-1, atr_warmup) in 0-indexed
□ Period variants: some implementations use EMA(20) + ATR(10) vs standard ATR(14)
□ Tolerance: < 0.001
```

Python Script:

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```
def keltner_channel(highs, lows, closes, period=20, atr_period=14, mult=2.0):
    n = len(closes)
    k = 2/(period+1); k_atr = 1/atr_period
    tr = [None]*n
    for i in range(1,n):
        tr[i] = max(highs[i]-lows[i], abs(highs[i]-closes[i-1]), abs(lows[i]-closes[i-1]))
    ema = [None]*n; atr_v = [None]*n
    ema[period-1] = sum(closes[:period])/period
    for i in range(period,n): ema[i] = closes[i]*k + ema[i-1]*(1-k)
    atr_v[atr_period] = sum(tr[1:atr_period+1])/atr_period
    for i in range(atr_period+1,n): atr_v[i] = tr[i]*k_atr + atr_v[i-1]*(1-k_atr)
    upper=[None]*n; lower=[None]*n
    for i in range(n):
        if ema[i] and atr_v[i]:
            upper[i]=ema[i]+mult*atr_v[i]; lower[i]=ema[i]-mult*atr_v[i]
    return ema, upper, lower
```

---

10. Practical Exercises

Exercise 1: Close > Upper_KC for 3 consecutive bars

Situation: 4H BTC. Close > Upper_KC for 3 consecutive bars. BB still inside KC (no prior squeeze). ADX = 38.

Answer: Walk the upper channel — active bullish trend. No Short. Riding with trailing SL at EMA (Middle KC) or Lower KC. ADX=38 confirms strong trend. Exit at Close below EMA or ADX dropping below 25.

Exercise 2: Squeeze BB+KC on 4H — how to enter?

Situation: On 4H, BB narrower than KC for 8 bars. Sideways market. Decreasing volume.

Answer: Wait for confirmed breakout. Active squeeze = imminent explosion, unknown direction. Entry strictly at: bar that closes **completely** above Upper_KC (Long) or below Lower_KC (Short). SL on opposite side of KC. TP = 2× KC width. Volume must increase at breakout.

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11. Cheat Sheet — Quick Summary

Concept	Value / Rule
Middle	`EMA(Close, 20)` — EMA, NOT SMA
ATR	`Wilder RMA(TR, 14)` — K=1/14
Upper	`EMA + 2 × ATR`
Lower	`EMA − 2 × ATR`
Standard mult	2.0
Warm-up	20 bars (EMA dominates)
Lag	~14 bars (ATR Wilder)
Walk upper	Close > Upper consecutively → bullish trend
Walk lower	Close < Lower consecutively → bearish trend
Squeeze	BB < KC → imminent explosion
Squeeze breakout	First bar Close > Upper_KC → Long
Range entry	Touch Lower + RSI < 35 → Long; Touch Upper + RSI > 65 → Short
SL in trend	Below EMA (Long) / Above EMA (Short)
KC vs BB	KC more stable; BB more reactive to Close volatility
Cause #1 divergence	SMA instead of EMA as Middle
Cause #2 divergence	ATR standard EMA K=2/(N+1) vs Wilder K=1/N

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