Switch Position 1: Low-Z Uncompensated
Switch Position 2: Low-Z Compensated
Switch Position 3: BYPASS
Switch Position 4: Hi-Z Compensated
Switch Position 5: Hi-Z Uncompensated

1:1 Current Balun is optional
An additional SPDT relay can be included at the output to switch between a coax output [7/16ths DIN] or balanced line terminals.
An [optional] 50ohm dummy load is included

NOTES:
The choice of relays is down to the builder.
Better relays = more power handling. The same applies to the rotary switches
Maintain RF links with 50ohm coax wherever possible thus reducing impedance bumps
I'm using B2B Russian Military Vacuum Relays for K1 to K4 produced in the cold-war era.
Official rating is 15A/5Kv@32MHz key down. They are still around for about $30 a piece.
In reality, they will do 50% more [Tested at Los Alamos - USA] back in the 80's
This build as it stands is good for a 7.5kw PEP Tuner on 10m and around 10kw at 40m and below.
Build Cost: Around £800 upwards depending on components used

AE1
Antenna

1:1 Current Balun
Stacked Cores
4 x FT240-52
8 Turns

Internal
SWR/Power Meter
[User Choice]

Coax

C4
680pf@20kv

SW2C
SW_Rotary1x5

SW2B
SW_Rotary1x5

SW2A
SW_Rotary1x5

C3
680pf@20kv

C2
680pf@20kv

C1
680pf@20kv

L1
L Variable 0-20uh [Gates/Harris 20A] or equivalent

C6
Capacitor Vacuum Variable
10-1000pf @10Kv

C8
33pf@20kv

Position 3 = Bypass via Switch
to a 50ohm dummy load
Full Bypass available
via Relays K1 and K2

SW1A
SW_Rotary1x5

L2
6 Turns 20mm Ø

Tuner Output

SW1B
SW_Rotary1x5

50ohms
R5

B2B-1B SPST 10kv K4

D8 1N4007

B2B-1B SPST 10kv K3

D3 1N4007

-VDC

DC input to circuit depends on chosen relay coil voltage(s)

+VDC

R1
1k0

R2
1k0

D4
LED

D1
LED

SW1
SPST

SW2
SPST

D2
1N4007

K1 B2B-1B SPST 10kv

Tuner Input

D5
1N4007

K2 B2B-1B SPST 10kv

Tuner
Full
Bypass

SW1C
SW_Rotary1x5

C5_CompC
100pf@20Kv

Tuner Full Bypass

C7
33pf@20kv

SO239

From RX/TX

J1
Conn_Coaxial

SW3 SPST

LED D6

R3 1k0

SW4 SPST

LED D7

R4 1k0

Notes:
Relays K1 and 2 Pins 14/14 link with RG393 Teflon or eqivalent QRO Coax.
Keep coax earth leads as short as possible.
Earth at nearest point to the relays.
Values of C7 and C8 may be experimental.
Test on 50ohm dummy load on bypass mode and experiment with values to obtain best 1:1 SWR

K1 to K4 can be changed for any RF relay config of your choice. For example, the original design included Jennings RF1J SPDT relays but these have lower power handling, particulary at higher HF. Additionally, power handling will also be dependent on the type of rotary switches used and their configuration.

'L' tuners are much more efficient with lower losses than commonly available 'T' Matches

An 'L' tuner for the HF ham radio bands [160-10m] based on an original design by K7SFN. The design has been updated by Steve [G0UIH] and the original relays replaced using Russian B2B-1B's. The original version was quoted to handle 5kw. With the updated relays, the power handling should be closer to 7.5kw PEP @ 28MHz and 10kw at 40m and lower although the rotary switch type/config will also be a critical limiting factor.

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Title: 160-10m 'L' Tuner based around an original design by Frank J Dziurda K7SFN

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