"TCF" SSB/CW TRANSCEIVER FOR 80 M

See TCF-40 for full details. The TCF-80 appeared first in AR, followed somewhat later by the 40 metre model. Unfortunately, a band-switching model was not a viable option. If you want to make contacts during the day and night over long and short distances, then I suggest the 40 m version will find most use (and that you have a "full-licence"). The 80 m model will find most use in chatting with other stations during evenings and night time, although local contacts are easily possible during the day on this band. So the choice is yours. The set has the following measured performance:

Receiver	
Frequency Range:	Nominally 3.5 to 3.9 MHz.
Sensitivity:	0.5 uV for 10 dB S+N:N.
Reception Modes:	SSB (LSB), CW, DSB and AM (as SSB).
Image Rejection:	70 dB.
IF (6 MHz) Rejection:	60 dB.
Incremental Tuning (RIT):	Nominally +/-3.5 kHz.
Frequency Stability:	Less than 100 Hz in any hour after warm-up.

Transmitter	
Frequency Range:	Same as receiver.
Power Output:	At least 2 W, typically 4 W into 50 ohms.
Modes:	SSB (LSB) and CW.
Carrier Suppression:	35 dB.
USB Suppression:	35 dB.
Harmonics and Spurs:	At least -52 dB at full output.
Frequency Stability:	Same as receiver.
Load Tolerance:	Withstands any load SWR without damage.
Power Supply:	Nominally 12 Vdc at up to 1 A.

Circuit

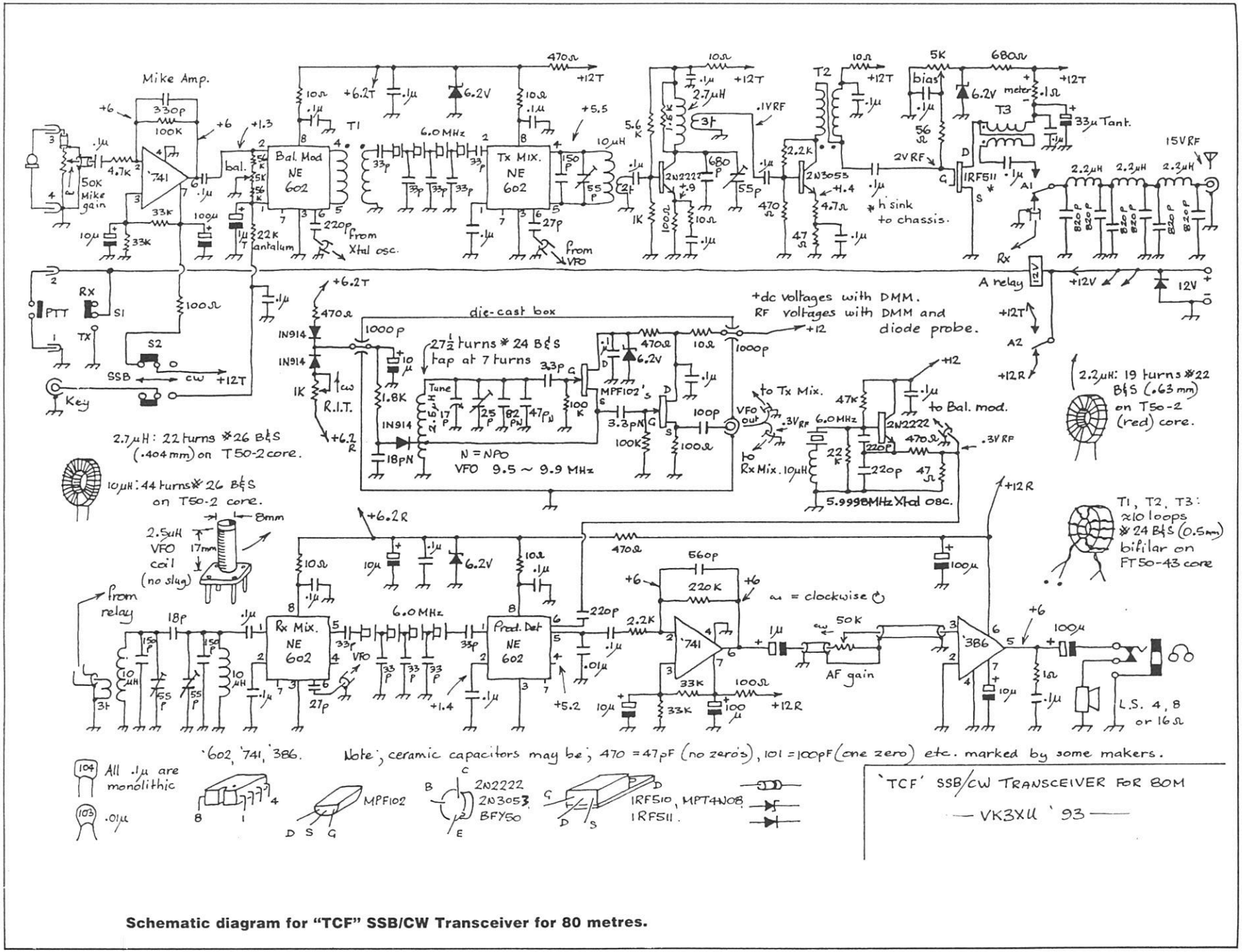
Similar to the TCF-40, with the following differences; Crystal filters (and therefore the IF) is 6 MHz for minimum spur production on both transmit and receive. VFO tunes from 9.5 to about 9.9 MHz.

Construction

Similar again. Same circuit board patterns. The variable capacitor for the VFO may be any well-made single-gang unit of about 15 or 20 pF. VFO and other coil details supplied on the circuit diagram. The 6.2 V zeners for +6.2T and +6.2R supplies may be replaced (as described for the TCF-40) with 6 V regulator chips, type 7806, for improved voltage (and hence frequency) stability. More audio gain may be had by adding a small electrolytic capacitor, about 2.2 uF at pins 1 and 8 of the '386 audio chip.

Alignment

Adjust VFO range to cover from 9.5 to 9.9 MHz. Adjust receiver input band pass filter for best overall response. On transmit, tweak bal. pot for best null. Key down- tweak TX MIX output tank C for peak at about 3.6 MHz, then peak 2N2222 amp. tank for max. output. Should obtain at least 2 W, probably more like 3 or 4 W output power. Plug in mike. Normal talk should produce nice output, current flicks up to about 900 mA on peaks. Do RIT adjustment as per TCF-40.



Schematic diagram for "TCF" SSB/CW Transceiver for 80 metres.

PARTS LIST FOR THE "TCF-80"

Capacitors	Qty
3.3 pF NP0 (black spot)	2
18 pF NP0	2
15 or 20pF variable (see text)	1
25 pF 'beehive' air trimmer	1
27 pF NP0	2
33 pF NP0	10
47 pF NP0	1
55 pF compression mica trimmer	4
150 pF poly or ceramic (second choice)	3
220 pF poly or ceramic (second choice)	4
330 pF ceramic	1
560 pFceramic	1
680 pF ceramic	1
820 pF poly or ceramic (second choice)	6
1000 pF feedthru	2
0.01 uF ceramic	1
0.1 uF monolithic	29
1 uF electrolytic	1
1 uF tantalum	1
10 uF electrolytic	5
33 uF tantalum	1
100 uF electrolytic	4
680 uF electrolytic	1

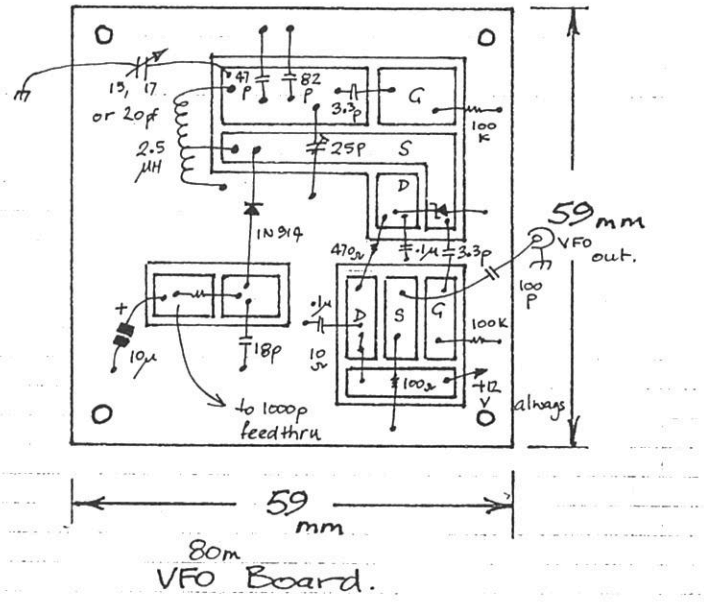
Resistors all 1/4 or 1/2 W	
0.1 ohm (or two 0.2 ohm)	1
1 ohm	1
4.7 ohm	2
10 ohm	8
47 ohm	2
56 ohm	1
100 ohm	4
470 ohm	3
680 ohm	1
1 kohm	1
1 kohm linear pot	1
1.5 kohm	1
2.2 kohm	2
4.7 kohm	1
5 kohm flat mount trimpot	2
5.6 kohm	1
33 kohm	4
47 kohm	1
50 kohm log pot	2
56 kohm	2
100 kohm	3
220 kohm	1

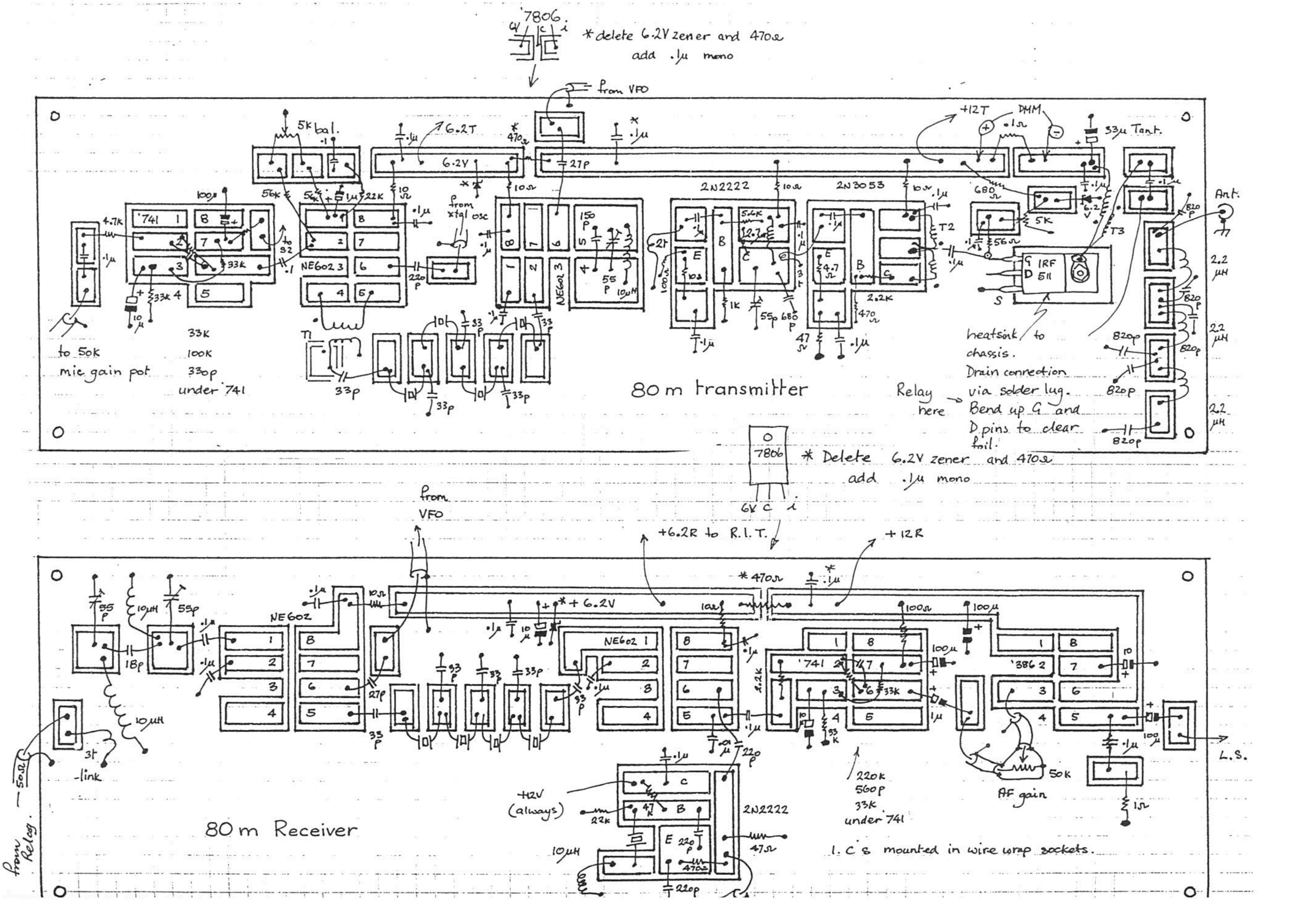
Semiconductors

MPF102, 2N5457, etc.	2
2N2222, 2N3904, etc.	2
2N3053, BFY50, etc.	1
IRF510, IRF511, MTP4N08 etc.	1
NE602AN	4
LM741	2
LM386	1
7806/1A regulator chip	2
6.2 V/400 mW zener	2
1N4148 or 1N914 diode	3

Miscellaneous

Case to suit, or sheet aluminium to make, die cast box approx. 122 x 41 x 66 mm, Amidon T50-2 cores (8), FT50-43 cores (3), 6.0 MHz crystal (9, all identical brand), 6 or 4-pin 8 mm bakelite coil former, dial drive, coupler, perspex, 12 V lamp & holder, 8-pin DIL wire wrap sockets (7), single or double-sided circuit board material, speaker, mike socket, antenna coax connector, phones socket, key socket, RCA plug and socket for VFO, power supply terminals, knobs, 12 V relay with two sets of c/o contacts, miniature SPST and DPDT switches (one each), miniature 50 ohm coax, #22, #24, #26 B&S enamelled wire, chassis items including IRF511 mounting hardware, screws, nuts, washers, and VFO spacers.





7806
*delete 6.2V zener and 470Ω add .1μ mono
from VFO
5K bal.
6.2T
6.2V
27P
2N2222
2N3053
+12T
DMM
33μ Tant.
Ant.
'741
NE602
from xtal osc
T1
T2
T3
IRF 511
2.2 μH
820p
to 50K
mic gain pot
33K
100K
330p
under '741
80 m transmitter
Relay here
heatsink to chassis.
Drain connection via solder lug.
Bend up G and D pins to clear foil.
7806
* Delete 6.2V zener and 470Ω add .1μ mono
from VFO
+6.2R to R.I.T.
+12R
*470Ω
+6.2V
NE602
'741
'386
10μH
55p
18p
3t
-link
From Relay
50Ω
+12V (always)
2N2222
220K
560P
33K
under 741
50K
AF gain
L.S.
80 m Receiver
I.C's mounted in wire wrap sockets.