

PRELIMINARY FOR MODEL TK-780. ID: ALH24583110
TK-280

Tuning procedure

Before attempting to tune the transceiver, connect the unit to a suitable power supply. Whenever the transmitter is tuned, unit must be connected to a suitable dummy load, unless the instruction specify otherwise. The speaker output connector must be terminated with a 4 Ohm dummy load at any time during the tuning and connected to an AC voltmeter and an audio distortion meter or a SINAD measurement at all the time during the tuning.

Power sw on during "A" push to test mode [1-1] then push "S" to tuning mode.
This *** mean using 3 numbers from CHANNEL NOB.

1 Transmitter section

1.1 Frequency adjustment
Set test mode CH1, Push "S" to enter tuning mode, Select [FREQ***], then PTT on.
160.100MHz±50Hz.

1.2 TX High power adjustment
Set test mode CH1, Push "S" to enter tuning mode, Select Hpow, Push "A" to 5 points.
a) Select [L Hpow***] then PTT on 4.8W±0.1W.
b) Push "C" to select [L2 Hpow***] then PTT on, push "B" after tuned.
c) Push "C" to select [C Hpow ***] then PTT on, push "B" after tuned.
d) Push "C" to select [H2Hpow***] then PTT on, push "B" after tuned.
e) Push "C" to select [H Hpow***] then PTT on, push "S" to return test mode.
The TX current is 2.2A or less.

1.3 TX Low power adjustment
Set test mode CH1, Push "S" to enter tuning mode, Select L pow, Push "A" to 5 points.
a) Select [L Lpow***] then PTT on 1.0W±0.1W.
b) Push "C" to select [L2 Lpow***] then PTT on, push "B" after tuned.
c) Push "C" to select [C Lpow***] then PTT on, push "B" after tuned.
d) Push "C" to select [H2 Lpow***] then PTT on, push "B" after tuned.
e) Push "C" to select [H Lpow***] then PTT on, push "S" to return test mode.
The TX current is 1.0A or less.

1.4 DQT BAL adjustment
Set test mode CH1, Push "S" to enter tuning mode, Select [BAL***], Push "A" to enter 3 Points,
a) Select [LBAL***] adjustments mode then PTT on Push "B" after tuned.
b) Push "C" to select [C BAL***] then PTT on push "B" after tuned.
c) Push "C" to select [H BAL***] then PTT on push "B" after tuned.
Push "A" to return to tuning mode.
d) Push "Lamp" to narrow adjustment mode [n BAL***], then PTT on push "B" after tuned.
Push "Lamp" to return tuning mode.
Make the de-modulation waves into square waves.

1.5 Max deviation adjustment
Set test mode CH1, push "S" to enter tuning mode, Push "A" to 3 points adjustment mode.
a) Select [L MAX***] then PTT on push "B" after tuned.
b) Push "C" to select [C MAX***] then PTT on push "B" after tuned.
c) Push "C" to select [H MAX***] then PTT on push "B" after tuned.
Push "A" to return tuning mode.
Deviation ±3.80KHz(Wide), ±1.75KHz(Narrow)
Push "Lamp" to narrow adjustment mode [n MAX***] then PTT on push "Lamp" to return

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tuning mode.

- 1.6 QT Deviation adjustment
- a) Push "S" to enter tuning mode select [FQT**] push "A" to adjustment mode.
 - Select [L FQT**] then PTT on push "B" after tuned.
 - Deviation $\pm 0.75\text{KHz}$ ($\pm 0.05\text{KHz}$)
 - b) same [C FQT**]
 - c) same [H FQT**]
 - d) same [N FQT**]

- 1.7 DQT Deviation adjustment
- a) Same as QT. Select [FDQT**]
 - b) same as [L FDQT**]
 - c) same as [C FDQT**]
 - d) same as [H FDQT**]
 - e) same as [N FDQT**]
 - Deviation $\pm 0.75\text{KHz}$ ($\pm 0.05\text{KHz}$)

- 1.8 LTR Deviation adjustment
- a) Select [LTR**]
 - b) Select [L LTR**]
 - c) Select [C LTR**]
 - d) Select [H LTR**]
 - e) Select [N LTR**]
 - Deviation $\pm 1.0\text{KHz}$ ($\pm 0.05\text{KHz}$) (Wide) $\pm 0.75\text{KHz}$ ($\pm 0.05\text{KHz}$) (Narrow)

- 1.9 DTMF Deviation adjustment
- a) Select [DTMF**] Deviation $\pm 2.5\text{KHz}$ ($\pm 0.05\text{KHz}$) (Wide)
 - b) Select [N DTMF**] Deviation $\pm 1.25\text{KHz}$ ($\pm 0.05\text{KHz}$) (Narrow)

- 1.10 MSK Deviation adjustment
- a) Select [FMSK**] Deviation $\pm 2.5\text{KHz}$ ($\pm 0.05\text{KHz}$) (Wide)
 - b) Select [N MSK**] Deviation $\pm 1.25\text{KHz}$ ($\pm 0.05\text{KHz}$) (Narrow)

2 Receiver section

2.1 Sensivity

- a) Select [SENS**] 12dB SINAD or more.

2.2 Tight squelch adjustment

- a) Select [SQL**] Adjust to point of opening squelch. (Wide)
- b) Select [N SQL**] Adjust to point of opening squelch. (Narrow)

3 Reference shift low (Use KPG-36, KPG-49D)

- a) connect to PC and FPU cable with Radio.
- b) Push to "Alt" to test mode from program. [CH: No1, Signaling No:1]
- c) Push to PFT10 to tuning mode.
- d) Select Reference shift Low.
- e) Push SPARE BAR (PTT ON)

4 Reference shift low (Use KPG-36, KPG-49D)

- a) Push to "Alt" to test mode from program. [CH: No1, Signaling No:1]
- b) Push to PFT10 to tuning mode.
- c) Select Reference shift High.
- e) Push SPARE BAR (PTT ON)

PARTS LIST

○ TK-780 (K1) CONTROL UNIT (X57-5720-10)

SYMBOL	PARTS NUMBER	PARTS NAME	DESCRIPTION
D501	HSB123	DIODE	SURGE ABSORPTION
D502	MINISMD C075-02	POLY SW	CURRENT PROTECTION
D507	DAN202U	DIODE	OR GATE (MIC MUTE)
D508	MA742	DIODE	LIMITTER
D509	MA742	DIODE	LIMITTER
D510	HSC119	DIODE	REVERSE CURRENT PREVENTION
D511	B30-2151-05	LED	LIGHT EMISSION
D512	B30-2171-05	LED	LIGHT EMISSION
D513	B30-2171-05	LED	LIGHT EMISSION
D514	B30-2171-05	LED	LIGHT EMISSION
D515	B30-2171-05	LED	LIGHT EMISSION
D516	B30-2171-05	LED	LIGHT EMISSION
D517	B30-2171-05	LED	LIGHT EMISSION
D518	HSB123	DIODE	CURRENT STABILITY
IC501	TA75W558FU	IC	AMPLIFIER
IC502	TC75W51FU	IC	AMPLIFIER
IC503	TA75W558FU	IC	AMPLIFIER
IC504	TC35453F	IC	AUDIO PROCESSER
IC506	BU4066BCFV	IC	ANALOG SWITCH
IC507	LC73872M	IC	DTMF DECODE
IC508	BU4094BCFV	IC	SHIFT/STORE RESISTER
IC509	RH5VL42C	IC	RESET IC
IC510	AT29C020-90TI	IC	FLASH ROM
IC511	30612M4A-407GP	IC	CPU
IC512	AT2408N10S12.5	IC	EEPROM
IC513	TA78L05F	IC	5V AVR
IC710	TA75S01F	IC	AMPLIFIER
IC711	TA75S01F	IC	AMPLIFIER
Q501	DTC314TU	TRANSISTOR	MIC MUTE
Q502	DTC144EE	TRANSISTOR	AF MUTE
Q503	2SC4617(S)	TRANSISTOR	AMPLIFIER (NOISE)
Q507	DTC144EE	TRANSISTOR	DC SWITCH (PA)
Q508	2SC4617(S)	TRANSISTOR	DC SWITCH (LED)
Q509	2SC4617(S)	TRANSISTOR	DC SWITCH (LED)
Q510	2SC4619	TRANSISTOR	CLOCK SHIFT
Q511	DTA144WE	TRANSISTOR	DC SWITCH (FSW)
Q512	DTC114EE	TRANSISTOR	DC SWITCH (BLC)
Q513	2SB1132(Q,R)	TRANSISTOR	DC SWITCH (LED)

PARTS LIST

○ TK-780 (K1) TX/RX UNIT (X57-5720-10)

SYMBOL	PARTS NUMBER	PARTS NAME	DISCRPTION
D1	HSB123	DIODE	SURGE ABSORPTION
D2	HSB123	DIODE	SURGE ABSORPTION
D3	HSB123	DIODE	SURGE ABSORPTION
D4	HSB123	DIODE	SURGE ABSORPTION
D5	HSB123	DIODE	SURGE ABSORPTION
D6	HSB123	DIODE	SURGE ABSORPTION
D7	02D220(Y,Z)	ZENER DIODE	VOLTAGE REFERENCE
D8	HSB123	DIODE	SURGE ABSORPTION
D9	HSB123	DIODE	SURGE ABSORPTION
D11	DAN202U	DIODE	DC SWITCH
D12	HSB123	DIODE	SURGE ABSORPTION
D13	HSB123	DIODE	SURGE ABSORPTION
D14	HSB123	DIODE	SURGE ABSORPTION
D15	DAN235E	DIODE	SURGE ABSORPTION
D16	ISS355	DIODE	RF SWITCH (TX/RX)
D17	HSB123	DIODE	REVERSE CURRENT PREVENTION
D20	ISS355	DIODE	SURGE ABSORPTION
D21	02D25.6(X,Y)	ZENER DIODE	VOLTAGE REFERENCE
D22	DAN235E	DIODE	IF SWITCH (WIDE/NARROW)
D23	DAN235E	DIODE	IF SWITCH (WIDE/NARROW)
D24	MINISMD C075-02	POLY SW	CURRENT PROTECTION
D25	ISS355	DIODE	REVERSE CURRENT PREVENTION
D26	ISS355	DIODE	REVERSE CURRENT PREVENTION
D27	HSM88AS	DIODE	REVERSE CURRENT PREVENTION
D28	02D215(X,Y)	ZENER DIODE	VOLTAGE REFERENCE
D30	HSM88AS	DIODE	APC VOLTAGE DETECT
D31	ISS355	DIODE	APC VOLTAGE DETECT
D32	22ZR-10D	SURGE ABSORBER	SURGE ABSORPTION
D33	DSM3MA1	DIODE	REVERSE CURRENT PREVENTION
D34	02D218(X,Y)	ZENER DIODE	VOLTAGE REFERENCE
D35	MA742	DIODE	LIMITER
D204	ISV286	VARICAP	RF BPF TUNEING
D205	ISV286	VARICAP	RF BPF TUNEING
D206	ISV282	VARICAP	RF BPF TUNEING
D207	ISV282	VARICAP	RF BPF TUNEING
D208	ISV282	VARICAP	RF BPF TUNEING
D209	HSB123	DIODE	TEMPERATURE COMPENSATION
D210	HSB123	DIODE	TEMPERATURE COMPENSATION
D211	MA4PH633	DIODE	ANT SW
D212	M1809	DIODE	ANT SW
IC1	TA75W01FU	IC	AMPLIFIER
IC2	TA75W558FU	IC	AMPLIFIER
IC3	TA75W558FU	IC	AMPLIFIER
IC4	TC4S66F	IC	SWITCH
IC5	M62363FP	IC	D/A CONVERT
IC6	TA75W01FU	IC	AMPLIFIER
IC7	BU4094BCFV	IC	SHIFT/STORE RESISTER

SYMBOL	PARTS NUMBER	PARTS NAME	DISCRPTION
IC8	BU4094BCFV	IC	SHIFT/STORE RESISTOR
IC9	TA78L05F	IC	5V AVR
IC10	LA4422	IC	AF AMP
IC11	TA31136FN	IC	FM DEMODULATION
IC12	TA78L05F	IC	5V AVR
IC13	AN8009M	IC	9V AVR
IC14	TA7808S	IC	8V AVR
IC15	TC4013BF(N)	IC	POWER SUPPLY LOGIC CIRCUIT CONTROL
IC200	GN2011(Q)	IC	D.B.M.
IC201	LMC7101BIM5	IC	PC/TV CONTROL
IC300	SA7025DK	IC	PLL SYNTHESIZER
IC400	M6774IH-32	IC	POWER MODULE
Q1	2SK1824	TRANSISTOR	AF SWITCH
Q2	2SC2412K(S)	TRANSISTOR	LIPPLE FILTER
Q3	2SC2412K(S)	TRANSISTOR	LIPPLE FILTER
Q4	DTD114EK	TRANSISTOR	DC SWITCH (HOR)
Q5	DTC114EE	TRANSISTOR	DC SWITCH (IGN)
Q6	DTC114EE	TRANSISTOR	DC SWITCH (HOR CONT.)
Q7	2SC4215(Y)	TRANSISTOR	BUFFER AMP.
Q8	DTC363EU	TRANSISTOR	AF MUTE SWITCH
Q9	DTA114YUA	TRANSISTOR	AF MUTE SWITCH
Q10	DTC114EE	TRANSISTOR	DC SWITCH (8R)
Q11	2SA1362(Y)	TRANSISTOR	DC SWITCH (8R)
Q12	2SB1132(Q,R)	TRANSISTOR	DC SWITCH (8T)
Q13	DTC114EE	TRANSISTOR	DC SWITCH (8T)
Q15	2SC2059K(P)	TRANSISTOR	IF AMP
Q16	DTC114EE	TRANSISTOR	DC SWITCH (W/N)
Q17	2SC2412K(S)	TRANSISTOR	APC SWITCH (APC)
Q18	2SK1824	TRANSISTOR	RX MUTE
Q19	2SD2394	TRANSISTOR	APC CONTROLLER
Q20	2SB1188(Q)	TRANSISTOR	APC CONTROLLER
Q21	FMW1	TRANSISTOR	APC CONTROLLER
Q22	DTC114EE	TRANSISTOR	DC SWITCH (TOF)
Q23	DTA114EE	TRANSISTOR	DC SWITCH (W/N)
Q24	DTC114EE	TRANSISTOR	DC SWITCH (W/N)
Q25	DTA114EE	TRANSISTOR	DC SWITCH (TOF)
Q26	DTA114EE	TRANSISTOR	DC SWITCH (PSW)
Q27	2SA1641(S,T)	TRANSISTOR	SB SWITCH
Q28	DTC114EE	TRANSISTOR	DC SWITCH (SB)
Q29	DTC114EE	TRANSISTOR	DC SWITCH (H/L)
Q30	DTA114EE	TRANSISTOR	DC SWITCH (SB)
Q31	DTC114EE	TRANSISTOR	DC SWITCH (SB)
Q32	2SK1824	TRANSISTOR	AF SWITCH
Q202	2SC3357	TRANSISTOR	RF AMP
Q203	2SC3357	TRANSISTOR	IF AMP
Q204	2SC2954	TRANSISTOR	RF AMP
Q300	2SC4215(Y)	TRANSISTOR	BUFFER AMP
Q301	2SC3722K(S)	TRANSISTOR	CHARGE POMP
Q302	2SC3722K(S)	TRANSISTOR	CHARGE POMP

PARTS LIST

○ TK-780 (K1)

SYMBOL	PARTS NUMBER	PARTS NAME	DISCRPTION
IC400	M67741H	IC	RF FINAL POWER MODULE