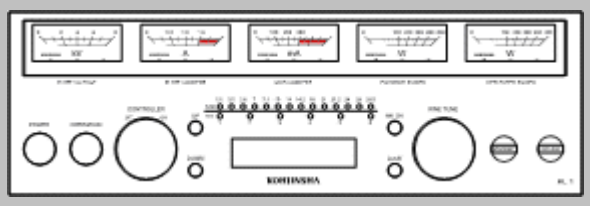
KOHJINSHA

Instruction Manual

HF ALL BAND
LINEAR AMPLIFIER

KL-1



KL-1 is designed to use only for amateur radio purpose.
You need proper license to use this amplifier.
Please keep this manual after reading well.
You can also find available options in this manual

Rev1.1 5. Nov. 2013

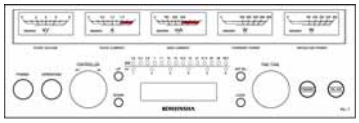
Thank you for choosing KL-1 as your amplifier.

KL-1 is the Kohjinsha 's state of the art HF all band linier amplifier, which has preset tuning, heavy duty power supply, and remote controller.

We would like you to read this instruction manual very well before using your KL-1., which should help to get the maximum performance from this amplifier. We would also like you to use KL-1 for long time.

ACESSARIES

Controller



Remote Control Cable 7m

Coaxial Cable with Connectors 7m
AC Cable 3m

RCA Plug 1pc
Lug Terminals For Power Supply 3pc
Earth Lug 2pc

Instruction Manual

Table of Contents

Read This Page For Your Safety

● We would like you to read『For Your Safety』very carefully to prevent from accident.

● We would also like you to keep this manual at your reachable place in order to read this anytime you need to check.

DANGER	DANGER Negligence of this sign may cause serious injury or death of operator or people around the operator.

◎ You must not place KL-1 in the nearby area in which inflammable object is used. It may cause explosion or fire.

WARNING	WARNING Negligence of this sign may cause serious injury or death of operator or people around the operator.

◎Negligence of cautions listed here may cause getting electric shock, leakage of electricity, or short circuit.

- ●Use a proper plug to connect AC wire with AC outlet. Never connect wire directly with the outlet.
- ●Have a ground earth before you connect AC plug with the outlet.
- ●You should use proper grounding materials to have ground earth. Don ' t use gas pipe, water pip, etc.,.
- ●You must not use broken AC wire or loose AC plug.

◎Negligence of cautions listed here may cause fire, unusual heat, electric shock, or major troubles of KL-1.

- ● You must be careful with AC power line capacity. Never use extensions or piggy backed outlet.
- ● Hold the plug when you pull out the plug. Never pull the wire.
- ● Don ' t step on wires or coaxial cable. You must not put things on wires or coaxial cable.
- ●AC wires or coaxial cable must not be twisted, pulled, broken, or given heat.

◎You should pull out AC plug while you don ' t use KL-1 for long time. Otherwise heat or fire may occur.

◎ Don ' t make any metal or wire touch the parts in the amplifier, or you may cause fire or trouble.

◎Don ' t use proper primary AC, or you may cause fire, electric shock, or trouble.

◎ Don ' t use KL-1in the nearby area where medical equipments are used. The interference on these equipments may cause serious accident.

◎If you are noticed thunder storm, remove all the connections from KL-1. Once you hear thunder rolls, you are better not touch antenna cables.

◎Just in case you hear usual noise, smell, or see smoke, stop using KL-1. If you continue using under such conditions, you may cause fire, get electrical shock, or trouble. Remove AC plug from the outlet, and make sure no more fire, smell, or smoke, contact us or our agent in your area.

CAUTION	CAUTION Negligence of this sign may cause your injurers, or may cause troubles with KL-1.

◎Negligence of CUASION sign may cause abnormal heat in the main unit, and then may make burnt, fire, trouble, or mechanically broken

- Don't install KL-1in the area with high humidity, dusty, airless.
- Don't install KL-1 too close to a wall.
- Don't block the vent hole of KL-1.
- Don't install KL-1 in the area of having direct sun light, or heated air coming out.

◎Negligence of this CAUTION may cause fall down of KL-1, fire, injury, or trouble.

- Don't move or install KL-1by only one person.
- Install on the very hard and stable place.
- Don't put anything on KL-1.

◎Don't install KL-1 close to television set or radio.

You may cause interferences.

◎Don't touch KL-1 or AC plug with wet hands.

You may get electric shock.

◎Open the case only when you change settings.

Otherwise your may get injury, electric shock, or cause trouble

◎Don't transmit without antenna or dummy load.

That may cause fire, or trouble.

◎Don't drop or give wham KL-1.

That may cause injury, or trouble.

◎Don't use thinner, benzene, gasoline, or such farmable liquid when you clean KL-1.

That may cause color change, distortion of case, or removing paint.

When you want to clean KL-1, use soft cloth with thinned kitchen detergent.

2-1 Front Panel

① Power Indicator

KOHJINSHA logo turns on with **GREEN** light when you connect AC plug with AC200V(220V, 230V, or 240V) and turn on the circuit breaker on the lower part of rear panel.

When you turn on by pressing POWER switch on the controller, the KOHJINSHA logo turns **RED**, which means you have high voltage on the tube.

2-2 Side Panel(Left and Right)

②③ Snap Fastener

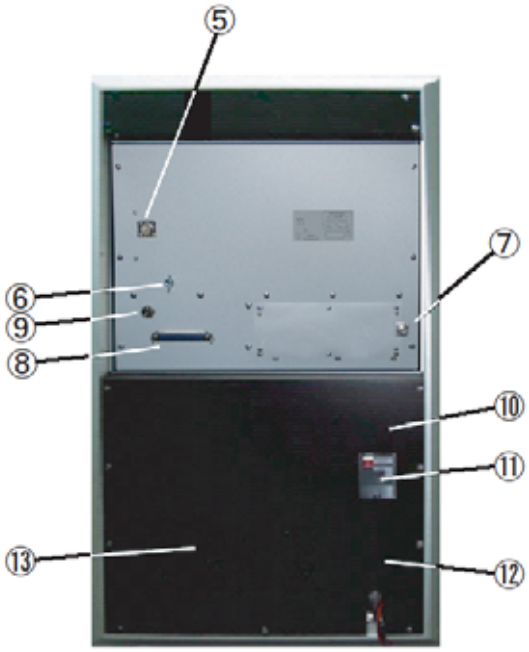
These are used when you need to remove side panels. Push down the hooks to unlock, then lift a panel to remove it.

2-3 Upper Panel

④ Ventilation Hole ⚠CAUTION

Hot air comes out of this hole to keep the tube proper temperature. Don ' t block air flow at anytime.
Otherwise you may give damage the tube.

2-4 Rear Panel(Upper Part)



⑤ ANT Connectors(Output)

There are six antenna connectors to use type-M(PL-259) connector. You can select which output to use from the controller.

⑥ GND terminal

Use this terminal to connect KL-1 to a good earth ground for safety.

Good earth ground should prevent electric shock accident or RF interferences.

Use a earth lug supplied with KL-1.

⑦ INPUT Connector

This is to connect with your transceiver(transmitter) RF out terminal.

Use the 7m coaxial cable that is supplied with KL-1 to get optimum performance.

⑧ REMOTE

This Amphenol 5OP is to connect with the controller by using 7m accessory cable that is supplied with KL-1..Push in firmly and make sure to lock it.

⑨ Ext ANT Selector

Use this connector to connect Ext Antenna Selector(Option)

2-5 Rear Panel (Lower Part)

⑩ Fuse

5A and 3A fuses are used.

Once fuse is blown, resolve the cause first, and then reinstall the same value of fuse.

⑪ Circuit Breaker

Circuit Breaker is tripped by equipment as soon as it detects failure of KL-1 like short circuit or over current. Rated current is 50A.

Push up the lever of the circuit breaker until you hear the click noise after you fix the trouble.

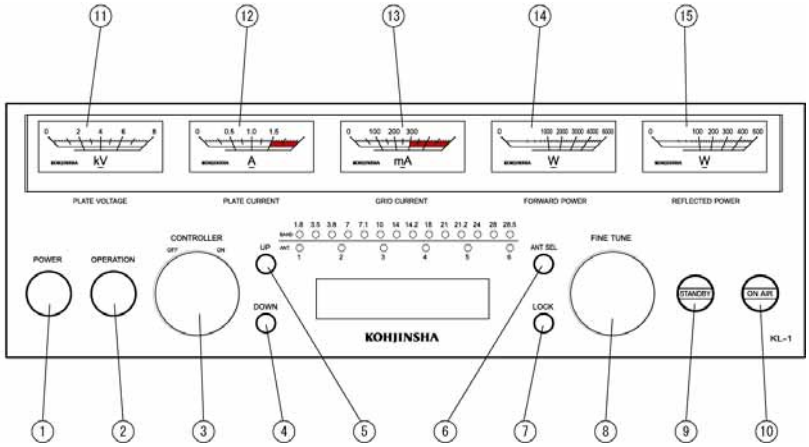
⑫ Primary AC Power Connection Terminals

Apply primary AC200V(220,230,or 240V) to this 3P terminal. Use thicker that AWG#8. Cable. Center is for GND connection. Apply AC to both side.

⑬ Ventilation Hole ⚠CAUTION

This is for KL-1 to intake outside air. Don't block this with anything.

3-1 Front Panel



① POWER SWITCH

Whole system power is made " ON / OFF " by Power Switch.
This switch toggles ON "" OFF " alternately.
The blue lamp of the circumference of a button lights up when KL-1 ' s power on.
The blue lamp of the circumference of a button goes out when KL-1 ' s power off.

② OPERATION SWITCH

When the KL-1 is detuned or changed band with OPERATION SWITCH is turned on, servo-motor automatically moves to tune on the band. STBY lamp will light when tuned.
Set the ⑧Fine Tune knob to stay center.
Operate with this OPERATION SWITCH ON usually.
If you don ' t use KL-1(through the amplifier), press this switch to put the blue lamp out.
In this mode band change of the exciter won ' t let KL-1 to tune.

③ CONTROLLER SWITCH

This switch works to antenna selection switch while KL-1 is powered off.
You need to keep this switch on for antenna relays to work during KL-1 ' s power off..

④ DOWN SWITCH

You can move band downward with this switch. Press once moves down to one lower band.

⑤ UP SWITCH

You can move band upward with this switch. Press once moves up to one upper band.

⑥ ANT SEL SWITCH

This switch changes connectors on the rear panel. Each press change from ANT1 to ANT6 sequentially. LED1 to LED6 work together with this switch.

⑦ LOCK SWITCH

You can not select antennas manually if this switch is turned on. You can change antennas from your transceiver or PC.

⑧ FINE TUNE

When you need to fine tuning, turn this know to get maximum power. Place this knob at center position normally.

When you fine tune, you MUST drive with 50W or little lower.

Because in order to prevent contacts of the variable inductor getting damaged by big amount of power and current.

⑨ STAND BY

This lamp shows green light on when KL-1 is ready to use after band change.

⑩ ON AIR

This lamp lights red while transmitting.

⑪ PLATE VOLTAGE

Plate voltage meter.

⑫ PLATE CURRENT

Plate current meter.

⑬ GRID CURRENT

Grid current meter.

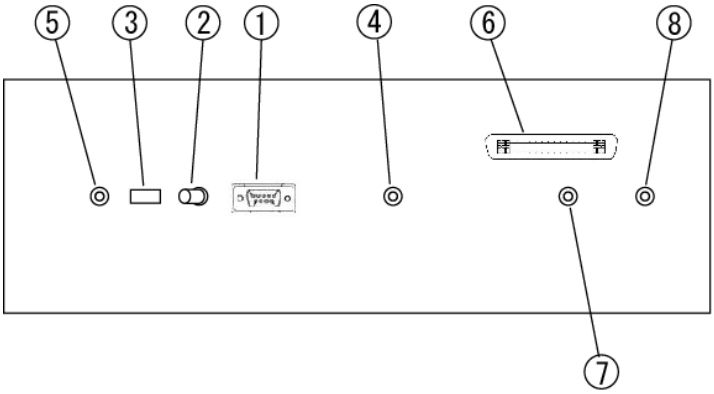
⑭ FORWARD POWER 5KW

Forward power meter.

⑮ REFLECTED POWER 500W

Reflected power meter.

3-2 Rear Panel



① RS232C Connector

This is used to connect with the radio that has RS232C interface.
Use RS232C straight cable.

② PC ⇔ RIG Switch

You can control KL-1 from either PC or transceiver.
Use this switch to select your favorite way.

③ USB Terminal

This is to connect with your PC.
Just connect with your PC. KL-1 works without drivers.

④ CI-V Terminal

You can connect with ICOM radios using this terminal. Use cable with 2p plug.

⑤ SteppIR Terminal

When you connect with SteppIR, use this terminal.
Use the cable to use for this purpose.（2Pプラグ・D-Sub9P）
More description regarding this cable in page 33.

⑥ REMOTE Connector

For Amphenol 50P connector with the supplied 7m connection cable.
Push the connector to the end and make sure if it is locked.

⑦ TX CONT

Connect with your transceiver ' s remote terminal(TX GND).

⑧ GND Terminal

Use this terminal to connect KL-1 to a good earth ground for safety.
Good earth ground should prevent electric shock accident or RF interferences.
Use an earth lug supplied with KL-1.

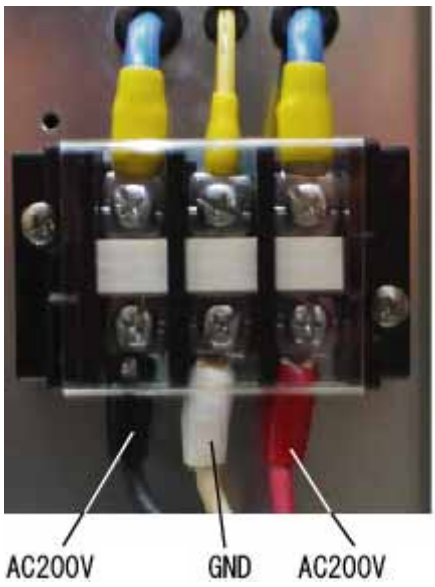
4. Installation and AC Wiring

There is a ventilation hole to take air in on the rear panel.
Do not block this hole with anything.
Installing KL-1 in dusty or high humid area may cause high voltage leakage.

Primary AC connecting wire is required thicker than AWG#8.
If you do not use proper wire, you may have fire from the heat.

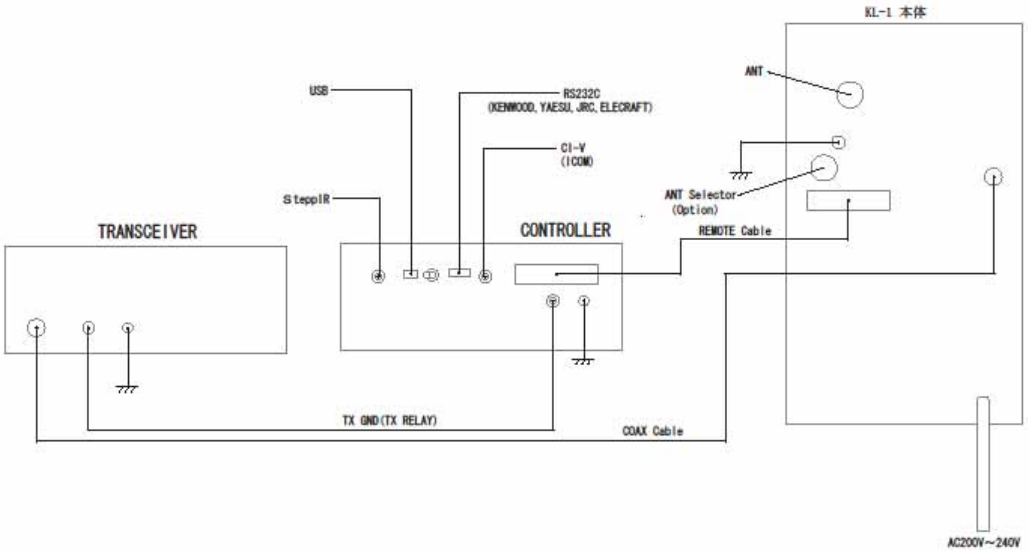
⚠WARNING

Primary AC Connection



5. External Connections

This shows external connections.

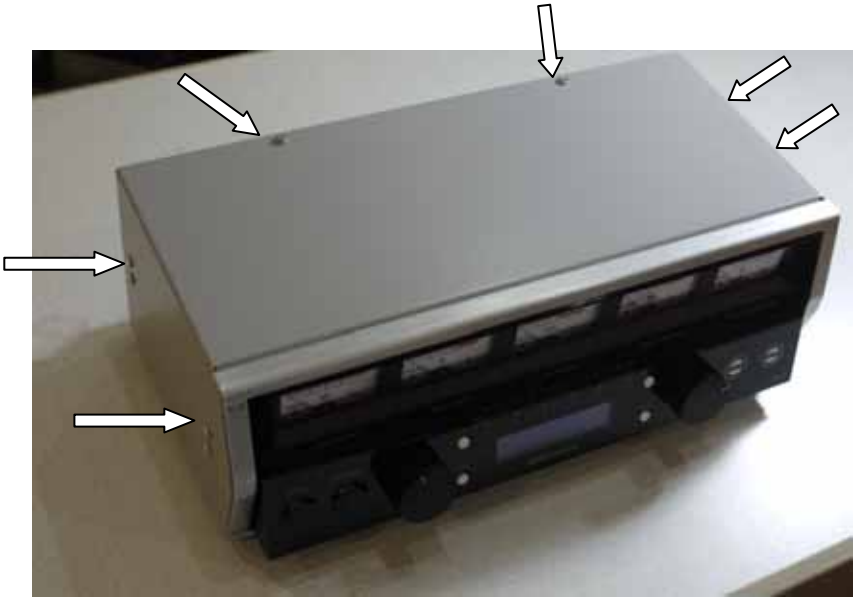


6. Controller Disassembling

Unscrew 6 nuts on the cover. Lift the cover and you can take it off..

Be careful in order not to get hurt.

⚠CAUTION

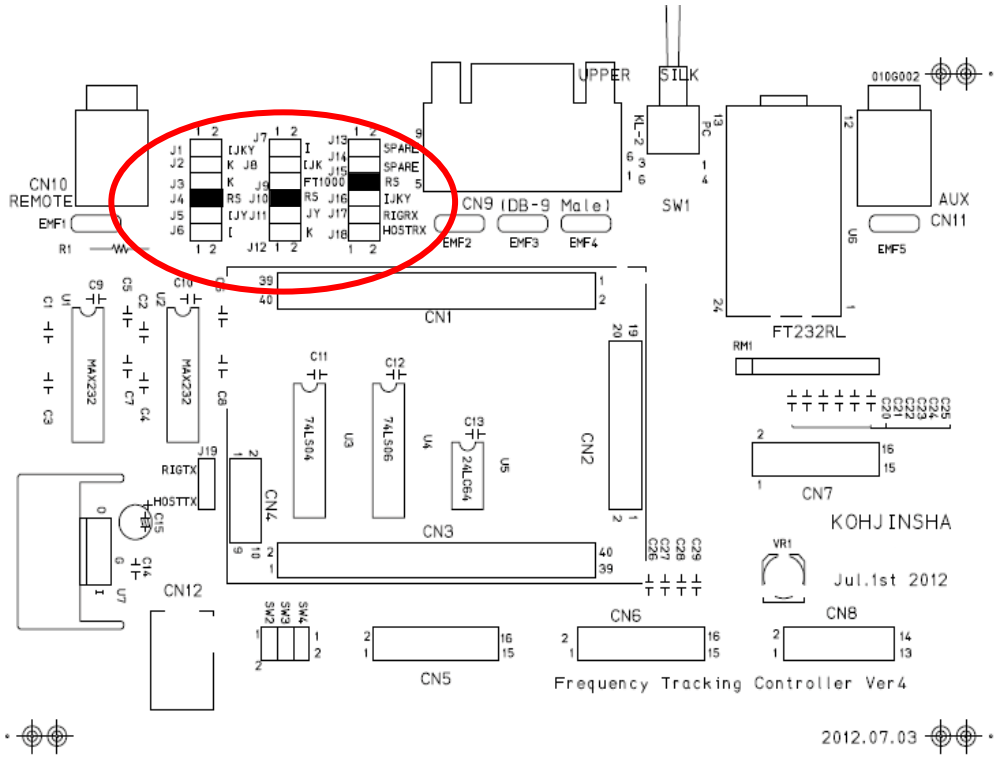


7. Controller Setup and Connections

You need to set up the controller settings and memory settings before you connect with your transceiver.
We would like to explain how to set up KL-1 controller to get full control KL-1 with your transceiver.

7-1 Boards in the Controller

You need to have proper jumper and memory setting in order to control KL-1 coordinating with your transceiver. The picture shows pin header locations on the CPU board.



7-2 Jumper Pin Settings and Connection for Different Transceivers

In this section we show jumper pin settings and cable for connection with different transceivers.

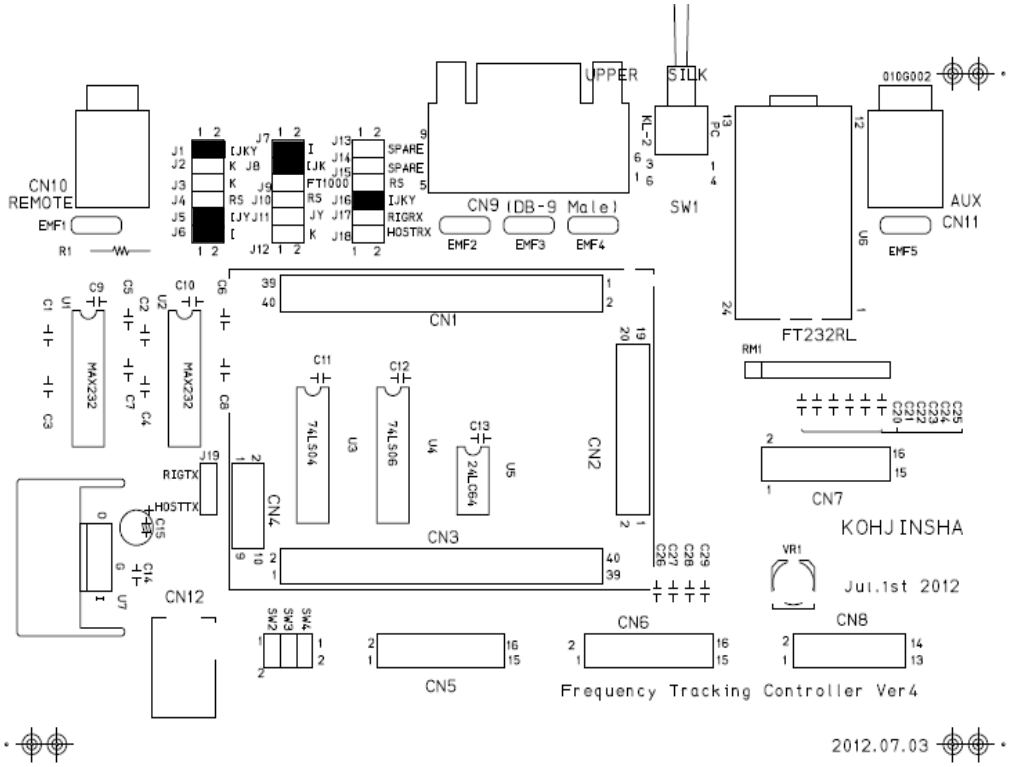
■ shows jumper pin position.
■ doesn't effect settings with or without jumper pin.

Each figure's bottom side is front side of the controller.

(※) You can not have both RS-232C connector and CI-V connector on the rear panel of KL-1. If you have both connectors, control function doesn't work. You should use either interface.

7-3-1 ICOM (CI-V)

1. Jumper Pin Settings on Tracking Board



2. Connecting with Your Transceiver

Connect remote jack of your ICOM transceiver with CI-V jack of KL-1 controller.

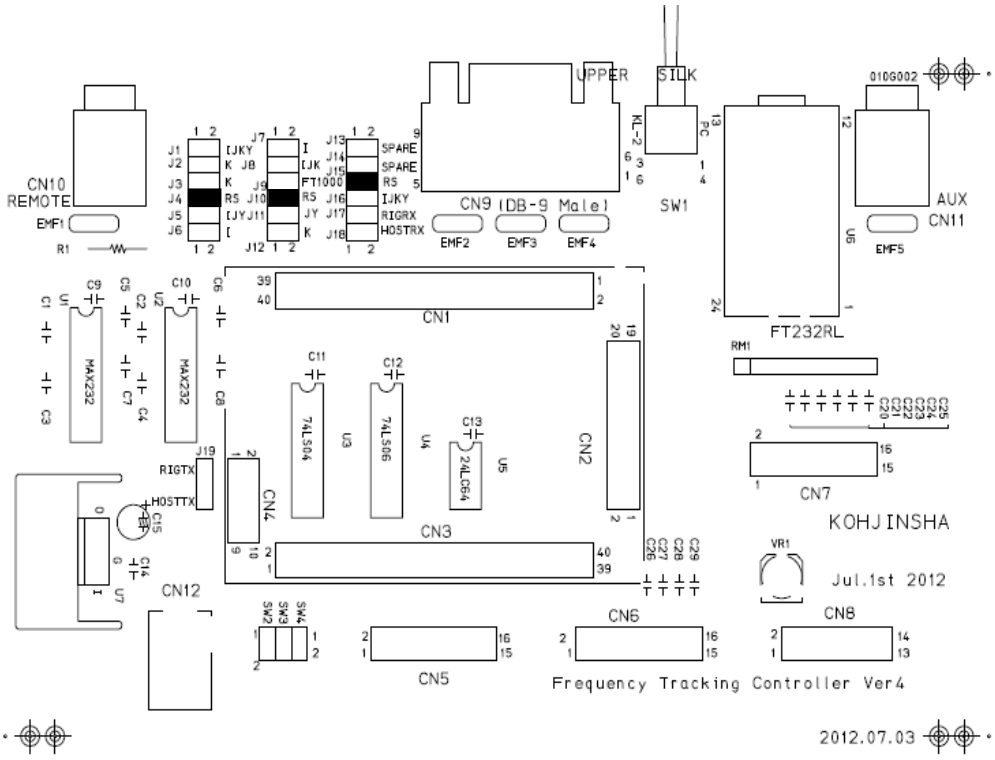
Use 2pin plug on both side with shielded cable.

Transceiver REMOTE
φ3.5 2p plug

KL-1 CI-V
φ3.5 2p plug

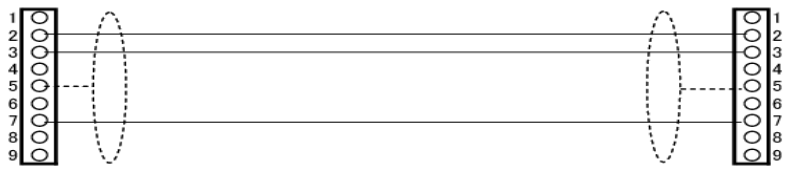
7-3-2 YAESU FTDX9000・FT2000・FTDX5000・FT1000MP・ MK-V

1. Jumper Settings on Tracking Board



2. Connecting with Your Transceiver

Use straight cable with DSUB9 female connector on both sides. You need to use only pin 2,3 and GND.

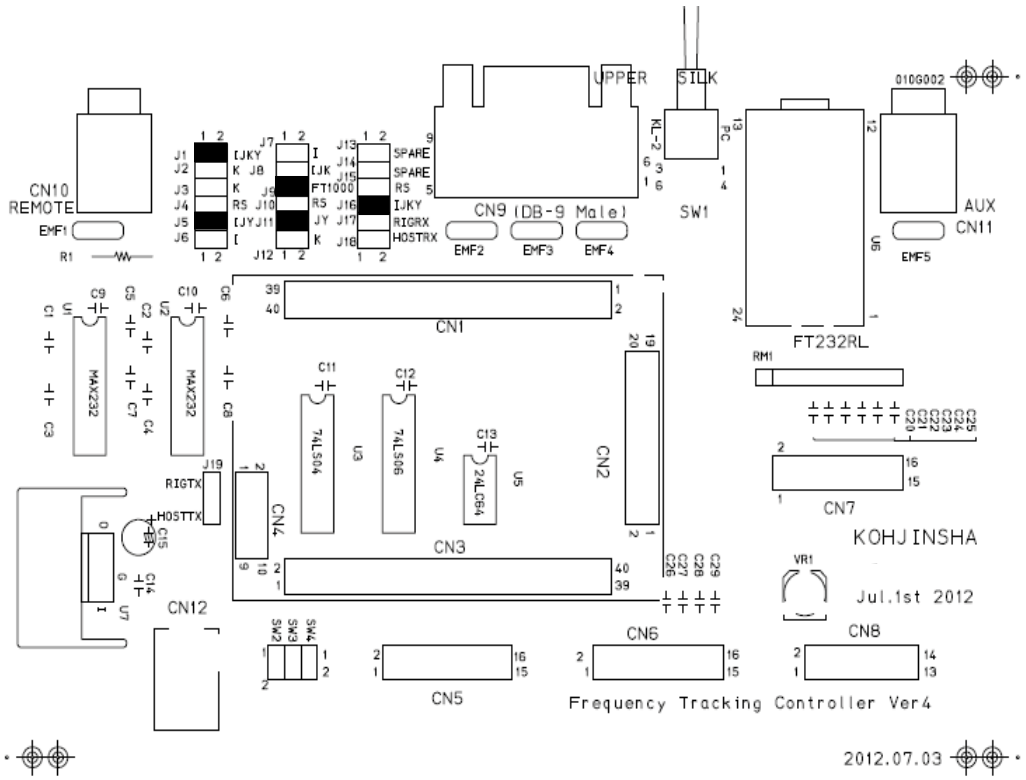


Transceiver CAT
D-SUB9(female)

KL-1 RS-232C
D-SUB9(female)

7-3-3 YAESU FT-1000・FT-1021

1. Jumper Setting on Tracking Board



2. Connection with Transceiver

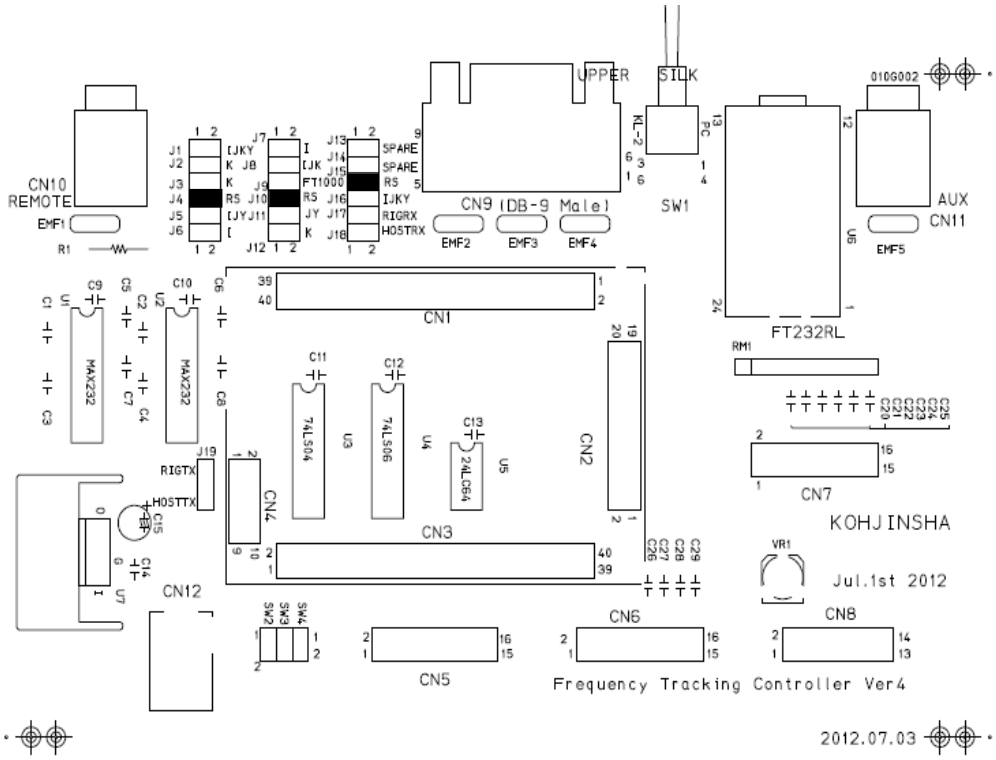
Connect CAT connector of your transceiver with RS232C connector of KL-1.
Use DIN 6pin connector for transceiver and RS232C(female) for KL-1
You need to use only pin 2,3 and GND.

Transceiver CAT
DIN6Pin

KL-1 RS-232C
D-SUB9(female)

7-3-4 KENWOOD TS2000・TS870・TS590・TS480・TS990

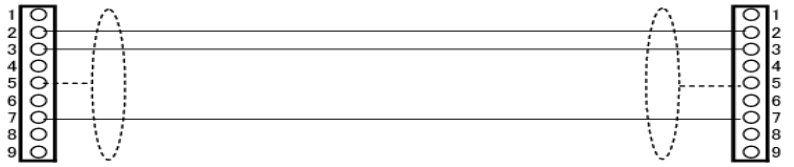
1. Jumper Settings on Tracking Board



2. Connection Transceiver with Controller

Connect COM connector of transceiver with RS232C connector of KL-1

Use straight cable with DSUB9 female connector on both sides. You need to use only pin 2,3 and GND.

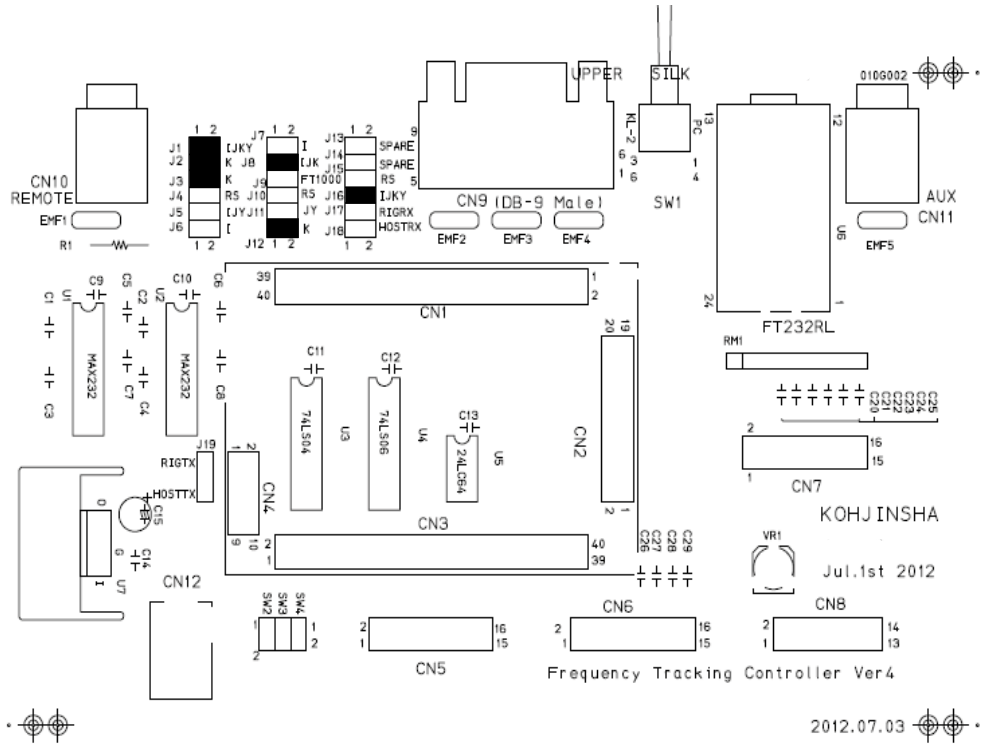


Transceiver COM
D-SUB9(female)
RS-232C

KL-1
D-SUB9(female)
RS-232C

7-3-5 KENWOOD TS-950・TS-850

1. Jumper Settings on Tracking Board



2. Connection Transceiver with Controller

Connect ACC1 of transceiver with RS232C connector of KL-1.

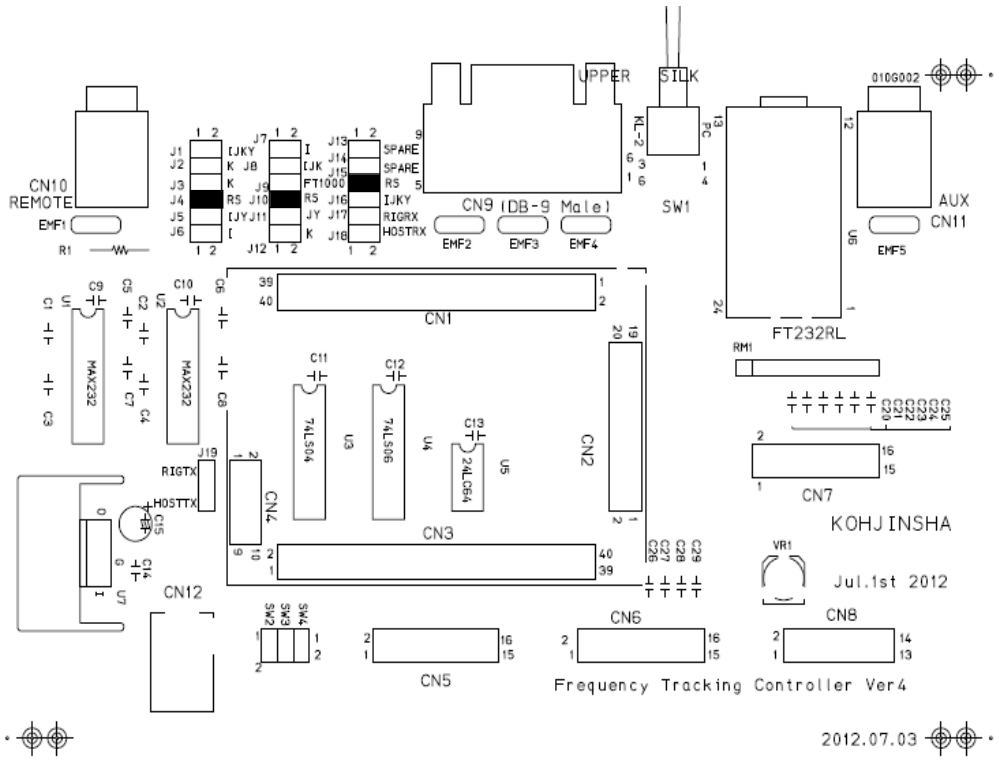
Use only pin 2,3, and GND with DIN 6pin for transceiver, and RS232C femaleforKL-1.

Transceiver ACC1
DIN6pin

KL-1 RS-232C
D-SUB9(female)

7-3-6 Elecraft K2・K3

1. Jumper Settings on Tracking Board



2. Connection Transceiver with Controller

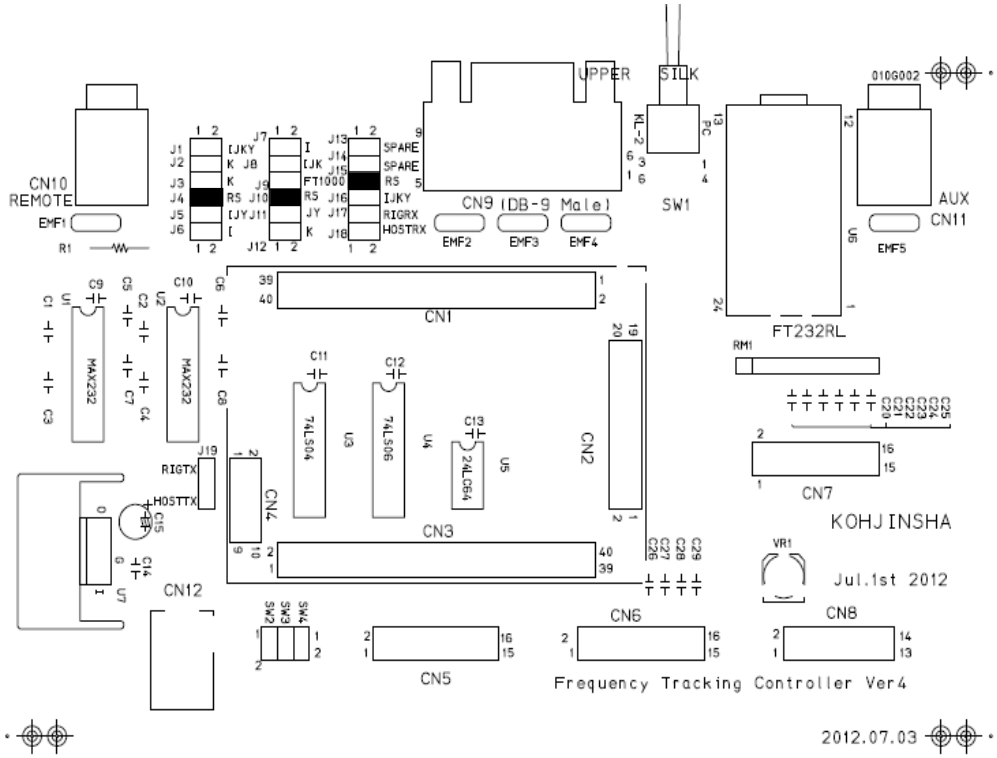
Connect CAT connector of your transceiver with RS232C connector of KL-1.
Use D-SUB9(male) connector for transceiver and D-SUB9(female) for KL-1
You need to use only pin 2,3 and GND.

Transceiver CAT
D-SUB9(male)

KL-1
D-SUB9(female)

7-3-7 JRC JST-145・JST-245

1. Jumper Settings on Tracking Board



2. Connection Transceiver with Controller

Connect RDS232C connector of your transceiver with RS232C connector of KL-1.

Use D-SUB25(male) connector for transceiver and D-SUB9(female) for KL-1

You need to use only pin 2,3 and GND.

Transceiver RS232C
D-SUB25(male)

KL-1 RS-232C
D-SUB9(female)

8-1 Memory

KL-1 has memory to store setting information. You can store your transceiver information.

8-2 Initializing Memory

Reset KL-1 memory to make it factory setting.

Turn on power switch of controller while pressing UP button of controller to make the memory written mode. You need only controller this time. You don't have to turn power on KL-1.

00:Exciter Type
●●●:●●●

After you see above indication on LCD, press DOWN button for a short while until you see the indication below. Now the memory is default set up.

Turn off power and turn it on again, and controller has default settings.

Write Default
Please Power OFF

8-3 Change Memory

Turn on power switch of controller while pressing UP button of controller to make the memory written mode.

00:Exciter Type
●●●:●●●
(note)

(note) ●●● displays the actual set up of the memory.

UP SW : Upper part of LCD display scrolling like 01, 02, 03, ・・・・
DOWN SW : Upper part of LCD display scrolling like 03, 02, ・・・
ANT SEL SW : Bottom part of LCD scrolling toward plus.
LOCK SW : Bottom part of LCD scrolling toward minus.

After setting up like above, press UP SW for a while until you see the message below on LCD.Now you set up your system in the memory.

Write Complete
Please Power OFF

Turn power off and then turn power on again.

KL-1 works under the new settings.

8-4 Memory Setting Table for Different Transceivers

ICOM(All ICOM radios)

00:Exciter Type	00:ICOM
01:Port1 BAUD	001:1200～016:19200bps(recomended:9600)
02:Stop bit	01:1 Stop bit

YAESU

FTDX9000・FT2000・FTDX5000

00:Exciter Type	016:YAESU AI
01:Port1 BAUD	004:4800
02:Stop bit	02:2 Stop bit

MK-V・FT1000MP

00:Exciter Type	001:MK-V 1000MP
01:Port1 BAUD	004:4800 (fixed)
02:Stop bit	02:2 Stop bit (fixed)

FT1000D, FT1021

00:Exciter Type	010:FT-1000
01:Port1 BAUD	004:4800 (fixed)
02:Stop bit	02:2 Stop bit (fixed)

KENWOOD

TS950・TS850

00:Exciter Type	006:TS-950_IF
	007:TS-950_AI (※1)
01:Port1 BAUD	004:4800 (fixed)
02:Stop bit	02:2 Stop bit (fixed)

(※1)Chose 007 if your TS950SDX , or TS850 output power becomes half with 1.6 second interval during transmittion.

TS2000・TS990・TS870・TS590・TS480 etc.

00:Exciter Type	005:KWD/K2/K3_AI
01:Port1 BAUD	004:4800
02:Stop bit	01:1 Stop bit

Elecraft

K2・K3

00:Exciter Type	005:KWD/K2/K3_AI
01:Port1 BAUD	004:4800
02:Stop bit	01:1 Stop bit

JRC

JST-245・JST-145

00:Exciter Type	008:JST-245_RS
01:Port1 BAUD	004:4800
02:Stop bit	01:1 Stop bit

8-5 Memory Setting Table

Setting Item	Setting Details	
00 : Exciter Type	000 : ICOM	**CI-V(All ICOM transceivers w/CI-V)**
	001 : MK-V 1000MP	FT1000MP,MK-V,FT1000MP
	002 : FT-100	FT-100
	003 : FT-920	FT-920
	004 : KWD/K2/K3_IF	TS2000,TS990,TS870,TS590,K2,K3
	005 : KWD/K2/K3_AI	TS2000,TS990,TS870,TS590,K2,K3 **005 is recommended, however 004 should work better with 004 depending on logging software.**
	006 : TS950/TS850_IF	**Choose 007 if your TS950SD(X) or TS850output power becomes half with 1.6 second interval during transmittion.**
	007 : TS950/TS850_AI	**You lose memory frequency tracking with this setting.**
	008 : JST-245_RS	JST-145/JST-245
	009 : JST-245_Lin	**KL-1doesn ' t use this setting.**
	010 : FT1000	FT-1000D,FT1021
	011 : FT767	FT767
	012 : Not Use	**KL-1doesn ' t use this setting.**
	013 : Not Use	**KL-1doesn ' t use this setting.**
	014 : Not Use	**KL-1doesn ' t use this setting.**
	015 : YAESU IF	FT2000,FTDX5000,FTDX9000
	016 : YAESU AI	FT2000,FTDX5000,FTDX9000
	017 : FT-847	FT-847
	018 : Stand Alone	In case of the your radio has rotary switch for band selection, or the radio doesn't have function to work with KL-1 interface.
01 : Port1 BAUD	Communication baud rate set up with transceiver Select 1200bps～38400bps ・YAESU transceiver,TS950, and TS850 004：4800 ・ICOM 001：1200 ～ 016：19200 (recommended rate 008：9600) ・FT2000,FTDX5000,FTDX9000,TS2000,TS990,TS870,TS590 etc. 004：4800 ～ 032：38400	
02 : Stop bit	Set stop bit number. ・YAESU、and 4800BAUD KENWOOD transceiver 02：2 stop bit ・Transceivers not listed as 2 stop bit. 01：1 stop bit	

Setting Item	Setting Details
03 : Logging Soft	00：Not Use 01：CT/ARCP-2000 02：Zlog 03：HAM Log 04：Logger32 05：Mixw2 06：FTC Logger 07：FTC Logger CT ・Control from your PC（by logging software） ICOM → 00：Not Choose this setting to use logging software YAESU → 01 ～ 05 choose your logging software KENWOOD → 01 ～ 05 choose your logging software ・Control from your rig ICOM → 00：Not Use Choose this setting to use logging software YAESU → 06：FTC Logger HAMLOG、ZLOG、Logger32、Mixw2 07：FTC LoggerCT LoggerCT KENWOOD → 00：Not Use Next you need to setup 00:Exciter Type. 005：KWD/K2/K3_AI or 007：TS950/TS850_AI for HAMLOG、Zlog, CT 004：KWD/K2/K3_IF or 006：TS950/TS850_IF for Logger32 と Mixw2
07 : Port2 BAUD	SteppIR 001：1200 ～ 016：19200（Factory Setting 008：9600） SteppIR default 9600bps

9-1 Antenna Selector (Option)

KL-1 has Ext 6 antenna selector connector (7P Jack). You can program in order for KL-1 to select any output connector for the transceiver frequency (band). You can tell which band was selected by numbered LEDs.

9-2 Antenna Selector Setup

Turn KL-1 controller power on.

Band.Sel	●●MHz (Note 2)
Ant.Lock	1

After the above message is displayed, press LOCK button for a while.
Message below should come out. Now you can select antennas.

Band.Sel	●●MHz (Note 2)
Ant.Sel	1

Next press ANT SEL button and you can select RF output connectors for the frequency (band).
One press ANT SEL button select RF output connector as 1→2→3→4→5→6→1 order.
After you select an antenna(RF output connector) , **LOCK ボタン press LOCK button, and the message below comes out. Setup is done.**

Band.Sel	●●MHz (Note 2)
Ant.Lock	●(Note 3)

(Note 2) ●●should be frequency
(Note 3) ● should be RF output connector number.

(EXAMPLE) In case you want to change output connector number from 1 to 3 for this frequency (●●MHz BAND),

①KL-1power on. Display shows as below.

Band.Sel	●●MHz
Ant.Lock	1

②Press LOCK button for a while., and you see the display show below.

Band.Sel	●●MHz
Ant.Sel	1

③Press ANT SEL button twice. Each pressing make the number change by one. This case the number becomes 3.

Band.Sel	●●MHz
Ant.Sel	3

④Press LOCK button. Setup is done if the display shows as below.

Band.Sel	●●MHz
Ant.Lock	3

10. PC Connection and Setting

10-1 Connection with PC

Use mini USB connector on the rear panel of KL-1 to connect with PC.

①If you use KL-1 without logging software, turn the SW on the rear panel to [RIG] side before turning KL-1 power on.

②If you use KL-1 with logging software, turn the SW on the rear panel to [USB] before turning KL-1 power on so that the logging software can communicate your transceiver and KL-1.
In this case your transceiver cannot send band data to KL-1 without logging software is running.

You need to setup KL-1 itself to use with PC.
You can connect PC with the radio that has USB connector like TS-590.

10-2 PC Connection

Make	Transceiver	Memory Setting	Note
ICOM	CI-V All ICOM transceivers	You don't have to setup for ICOM transceivers.	Wiith Logger32 in case KL-1 switches to another band, and come back quickly to the original band while tuning your transceiver frequency dial, turn off CI-V transceiver of your ICOM transceiver. If you set so, KL-1 doesn't coordinate with your transceiver without Logge32.
YAESU	FT-1000MK-V FT-1000MP FT-1000	03:Logging Soft Choose the logging software that you want to use. To user HAMLOG you need to put check mark for FT1000MP in HAMLOG input configuration, and set the timer command 5.	Make sure the CAT indicator of your transceiver is blinking. If CAT indicator is not blinking, tracking function doesn't work. When you use HAMLOG, you should have HAMLOG input window, otherwise CAT doesn't work.
YAESU	FTDX-9000 FT-2000 FTDX-5000	03:Logging Soft Choose the logging software that you want to use To use HAMLOG you need to put check mark for FT2000/9000 in input configuration , and set the timer command 0. Select KENWOOD in HAMLOG configuration.	You may have trouble of tracking function depending on how you use the logging software.
KENWOOD	TS-950 TS-850	00:Exciter Type Select 007:TS950/850_AI、 03:Logging Soft choose your logging software.	Turn power transceiver on, and KL-1 on, then initialize your logging software. Make sure you see the transceiver frequency(RX band) on display.
KENWOOD	TS-2000 TS-870 TS-480 TS-570 TS-990	00:Exciter Type Select 005:KWD/K2/K3_AI 03:Logging Soft Choose your logging software.	Turn power transceiver on, and KL-1 on, then initialize your logging software. Make sure you see the transceiver frequency(RX band) on display.
JRC	JST-145 JST245	Logging software is not available.	

11. SteppIR Connection and Setting

For ANY Manufacturer's transceiver you need t to set SteppIR 「Transceiver Setup」 「ICOM」.

Set SteppIR baud rate as same rate as KL-1 is. (Memory setup 007:Port2BAUD) Default setting of Both KL-1 and SteppIR are 9600bps.

Use ICOM cable supplied by SteppIR Antenna Inc.,. Plug it to SteppIR jack on rear panel of KL-1 controller.

Transceiver Setup Mode

Setup Baud 9600

Set Mode 「ICOM」

12. Operation(CW,RTTY,SSB)

3CX3000A7 has a directly heated filament as a cathode.
After turned on power, you have to wait only a few seconds to transmit if tuning is done.

During the OPERATION switch on, servo-motor works to tune automatically if you change band.
(If OPERATION switch is off, KL-1 is **not** tuned automatically.)

You can not transmit until KL-1 is tuned.
(STBY lamp is off during tuning period.)

When tuning is done, STBY lamp gets GREEN. Now you can transmit.

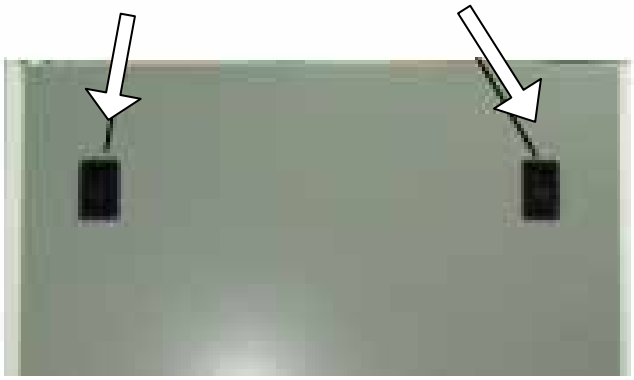
(Note)
If you need to move FINE TUNE for adjustment, reduce driving power to about 50W.

Above action should prevent the moving contact of the variable inductor from getting deteriorated by high power and large current.

13. Transformer Wiring

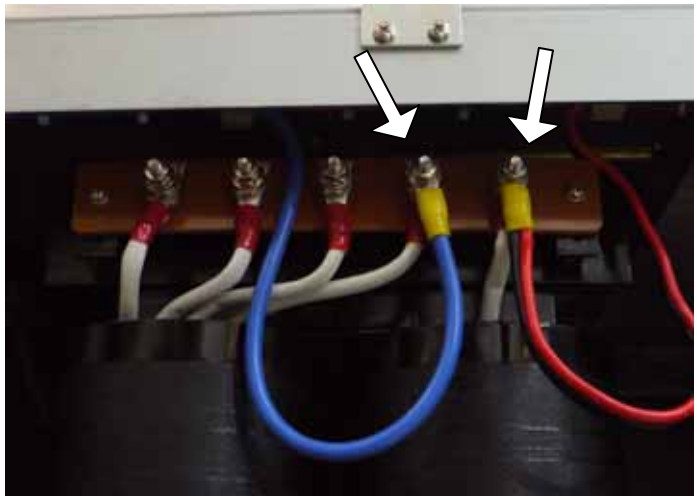
1. Remove AC cables from the AC power outlet or push down the lever of the circuit breaker on the backside of main frame in order for you not to get electric shock.

2. Removing left side panel.
   Push down the lever of snap fasteners to unlock and lift the panel to remove it.



3. Removing left side panel, you can see primary connection of the high voltage transformer. You can change the connection to match your area.

⚠CAUTION



4. Make sure no wrong wiring or short circuit, and then put the left side panel to original position.

5. Push up the lever of the breaker or connect KL-1 AC plug with outlet.

14. Specifications

Frequency Range	1.800MHz ～ 1.999MHz
	3.500MHz ～ 3.660MHz
	3.660MHz ～ 3.999MHz
	7.000MHz ～ 7.110MHz
	7.110MHz ～ 7.300MHz
	10.100MHz ～10.150MHz
	14.000MHz ～ 14.150MHz
	14.150MHz ～ 14.350MHz
	18.068MHz ～ 18.168MHz
	21.000MHz ～ 21.210MHz
	21.210MHz ～ 21.450MHz
	24.890MHz ～ 24.990MHz
	28.000MHz ～ 28.300MHz
	28.300MHz ～ 29.700MHz
Operating Temperature Range	0℃～＋40℃
Input Impedance	50Ω Unbalanced
Maximum Tuning Time	Approximately 30 seconds (From 1.8MHz to 28.300MHz or vice versa.) (Move to next band takes only a few seconds.)
Supply Voltage	AC200～ 240V（Single phase 50 / 60Hz）
Ground	Minus ground
Maximum Driving Power	200W
Maximum Output Power	CW / RTTY / SSB(PEP)： 4KW (see NOTE)
Undesired Spurious Suppression	Less than -40dB
Dimension	Main Unit ：Width478×height800×Depth564 mm (Any object that come out from the surface are not included to measure.) Controller ：Width320×Height107×Depth187．5mm (Any object that come out from the surface are not included to measure.)
Weight	Main Unit ： 106kg Controller ： 3.5kg

Note: You must follow your country ' s regulation regarding out put power.

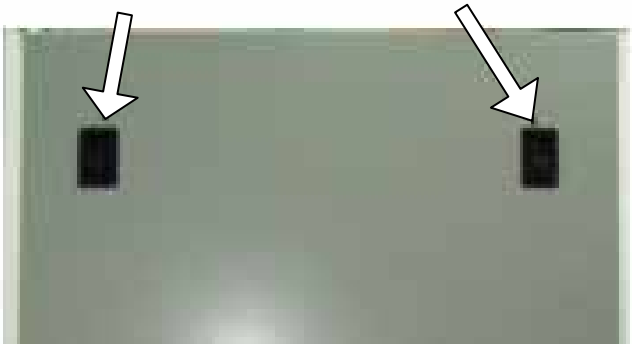
※Specifications were measured in the way that JAIA(Japan Amateur Industrial Association).
※Specifications, outside appearances may be changed to improve without any notice.
※Tuning time may change according to load condition.

15. Disassembling Main Frame

1. Remove AC cables from the AC power outlet or push down the lever of the circuit breaker on the backside of main frame in order for you not to get electric shock.

CAUTION

2. Removing left side panel. Push down the lever of snap fasteners to unlock, and then lift the panel to remove it.



3. Removing four screws on each corners of the upper panel to take the panel off.

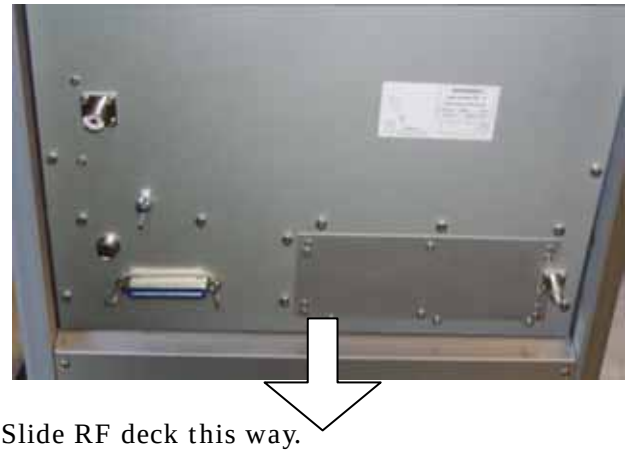
1. Removing nine screws to take off rear fan cover.

2. Remove four metal plate that are located lower part of both sides of RF deck.

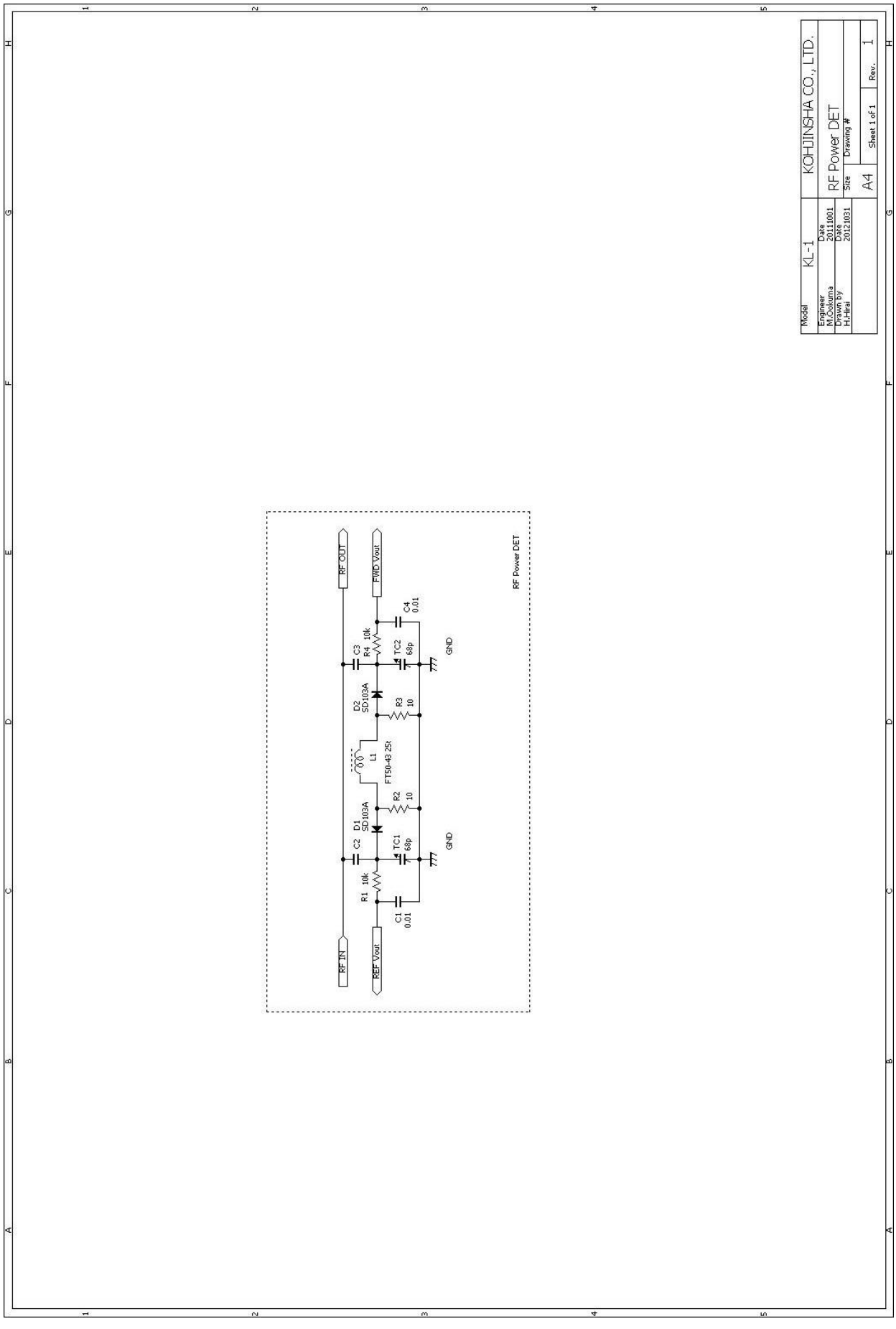
Remove HV connector, and 12pin canon connector from RF deck. They are located right bottom of RF deck looking at from the front side.

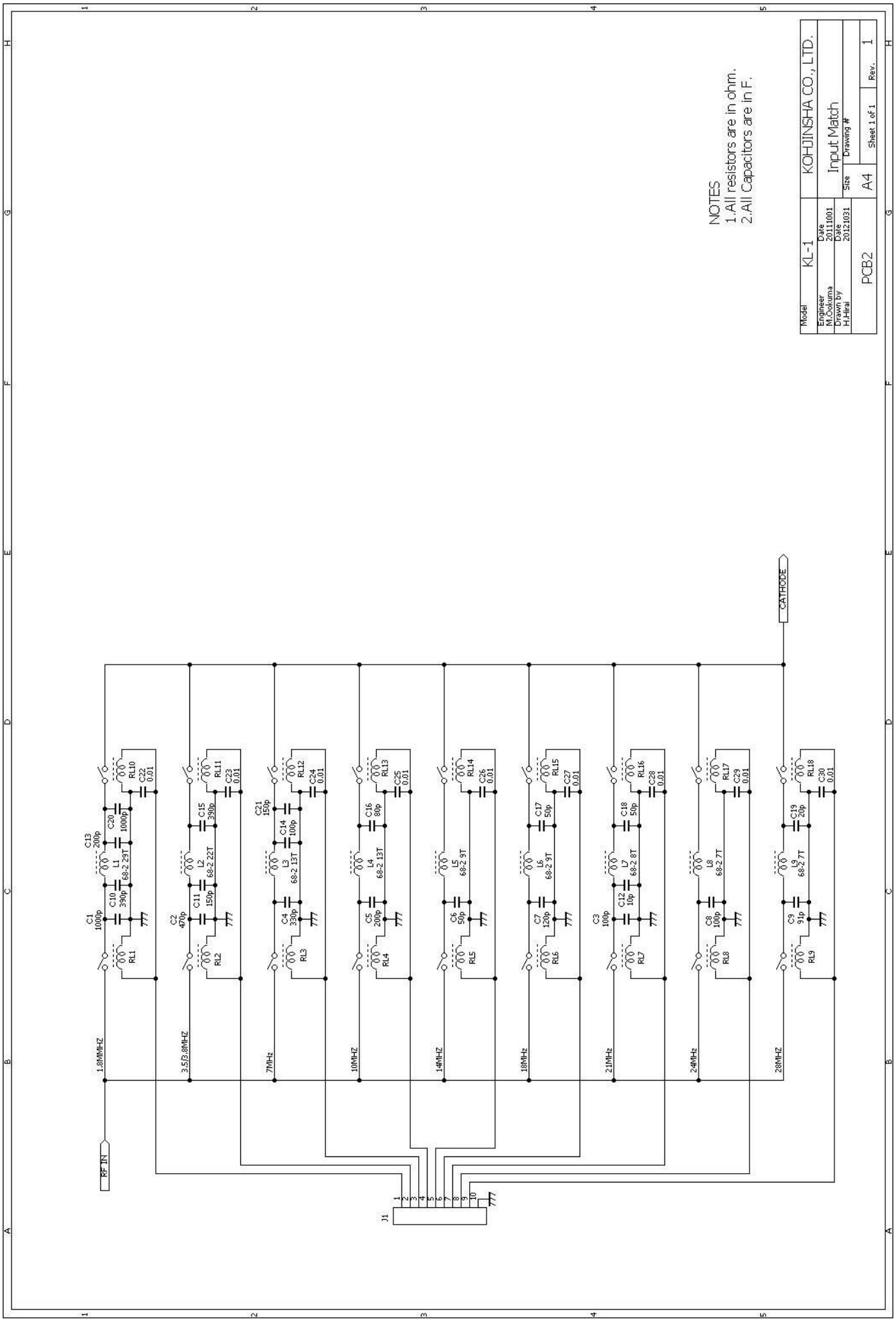
3. Pull out RF deck to backward. (Please be careful in order not to get hurt yourself because RF deck is heavy.)

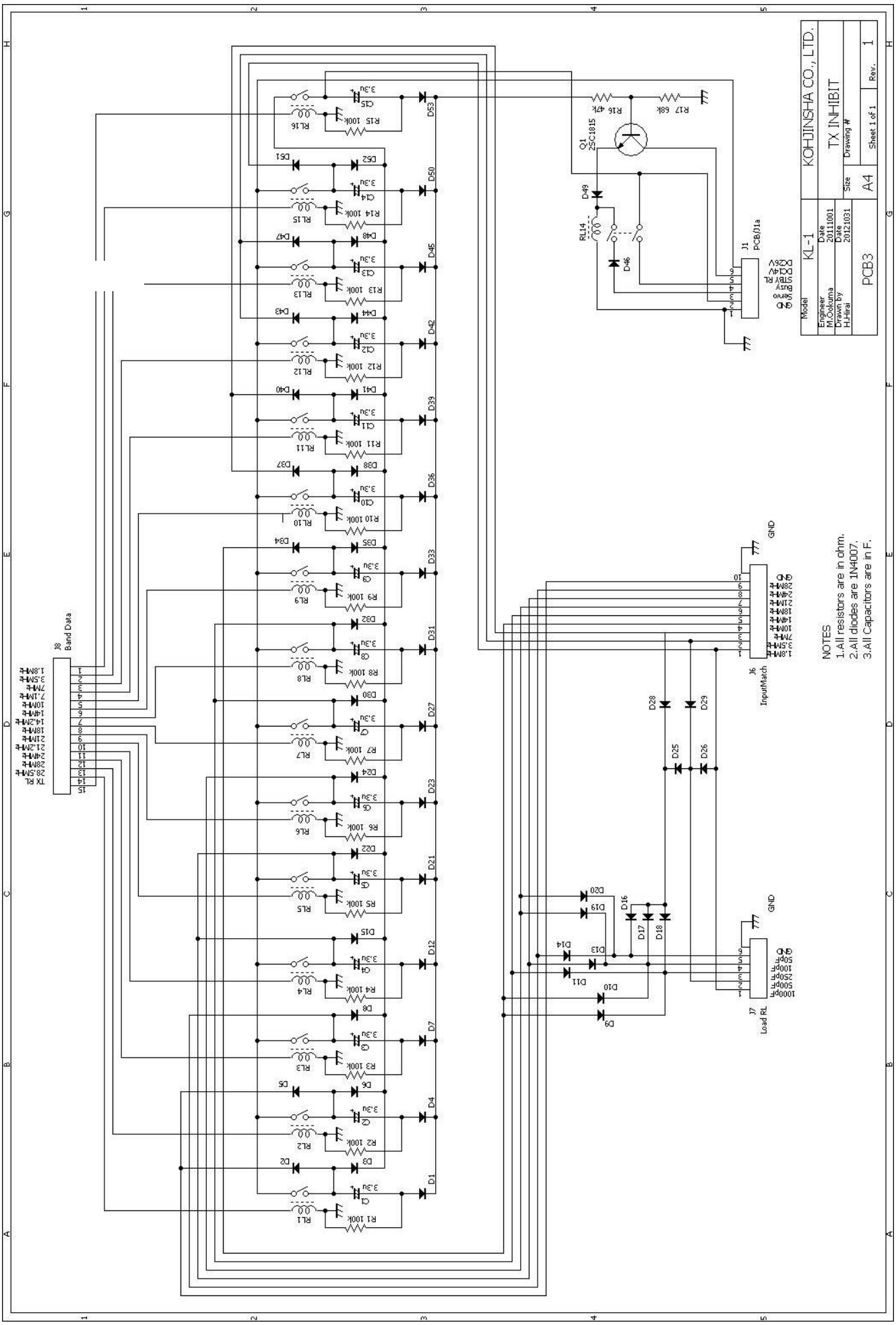
⚠CAUTION

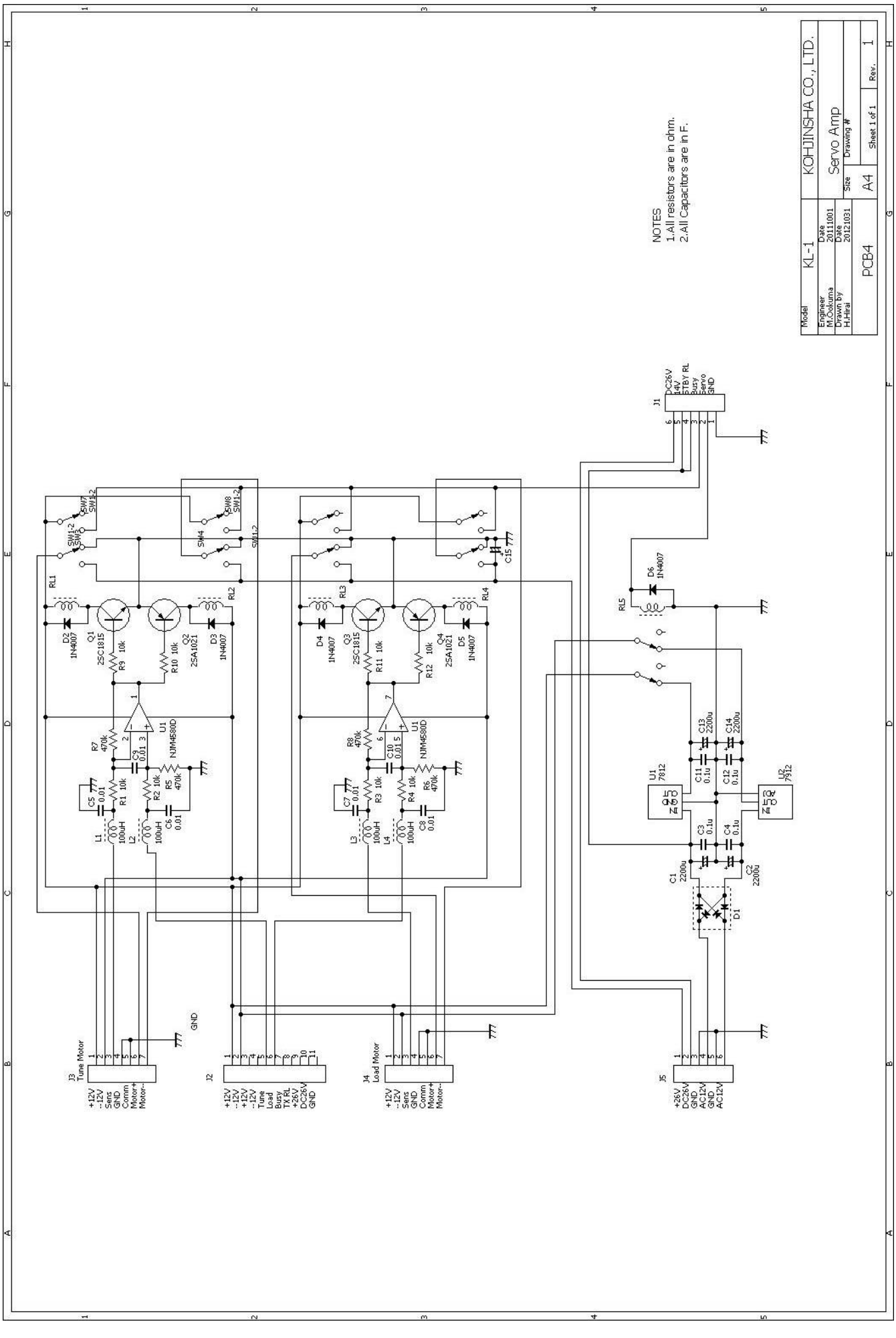


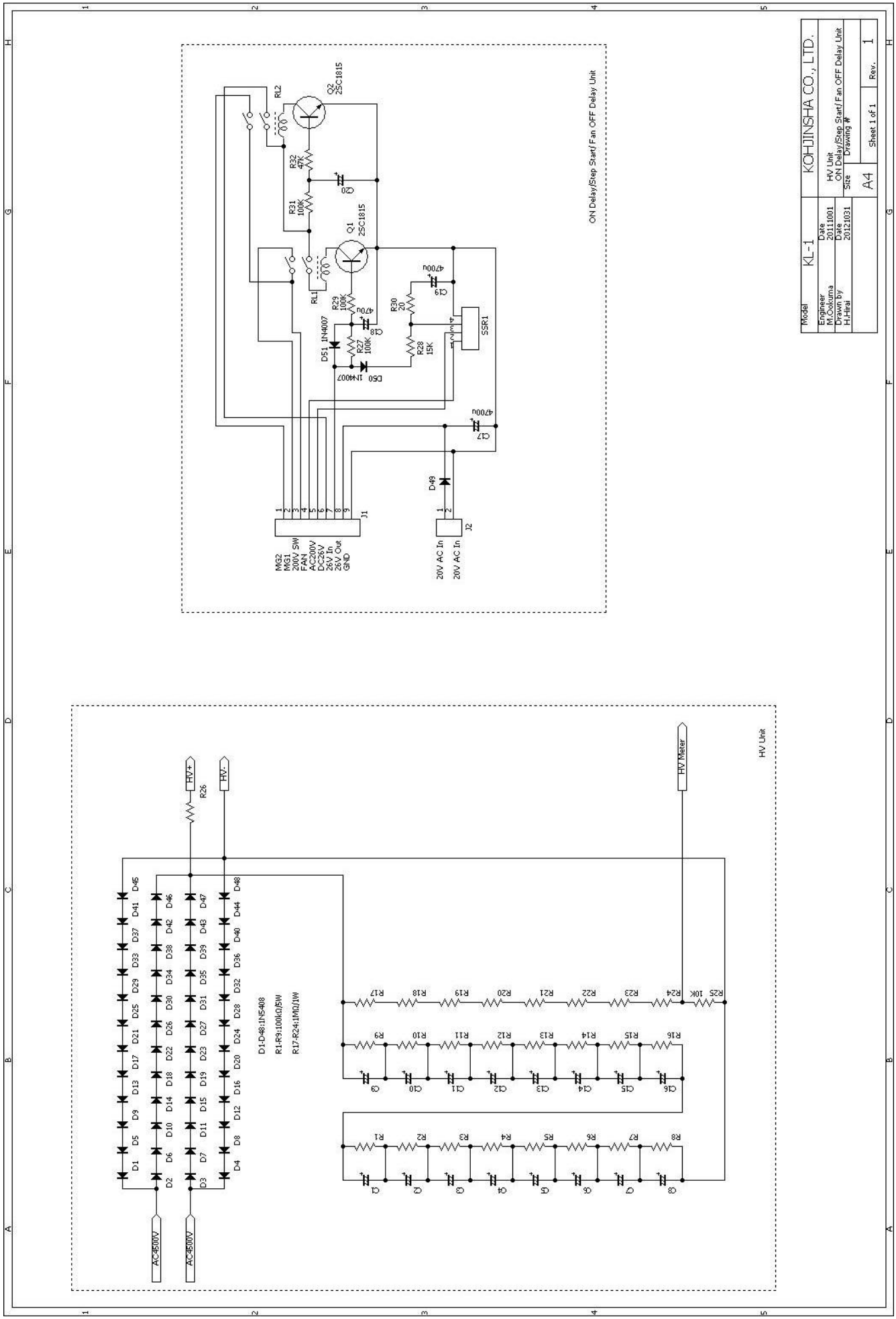
Slide RF deck this way.


RF OUT
FWD Vout
C4
0.01
C3
R4
10k
TC2
68p
GND
D2
SD103A
R3
10
L1
FT50-43 25t
R2
10
D1
SD103A
C2
TC1
68p
GND
R1
10k
C1
0.01
RF IN
REF Vout
RF Power DET
Model
KL-1
KOHJINSHA CO., LTD.
Engineer
M.Okuma
Drawn by
H.Hirai
Date
20111001
Date
20121031
RF Power DET
Size
A4
Drawing #
Sheet 1 of 1
Rev.
1

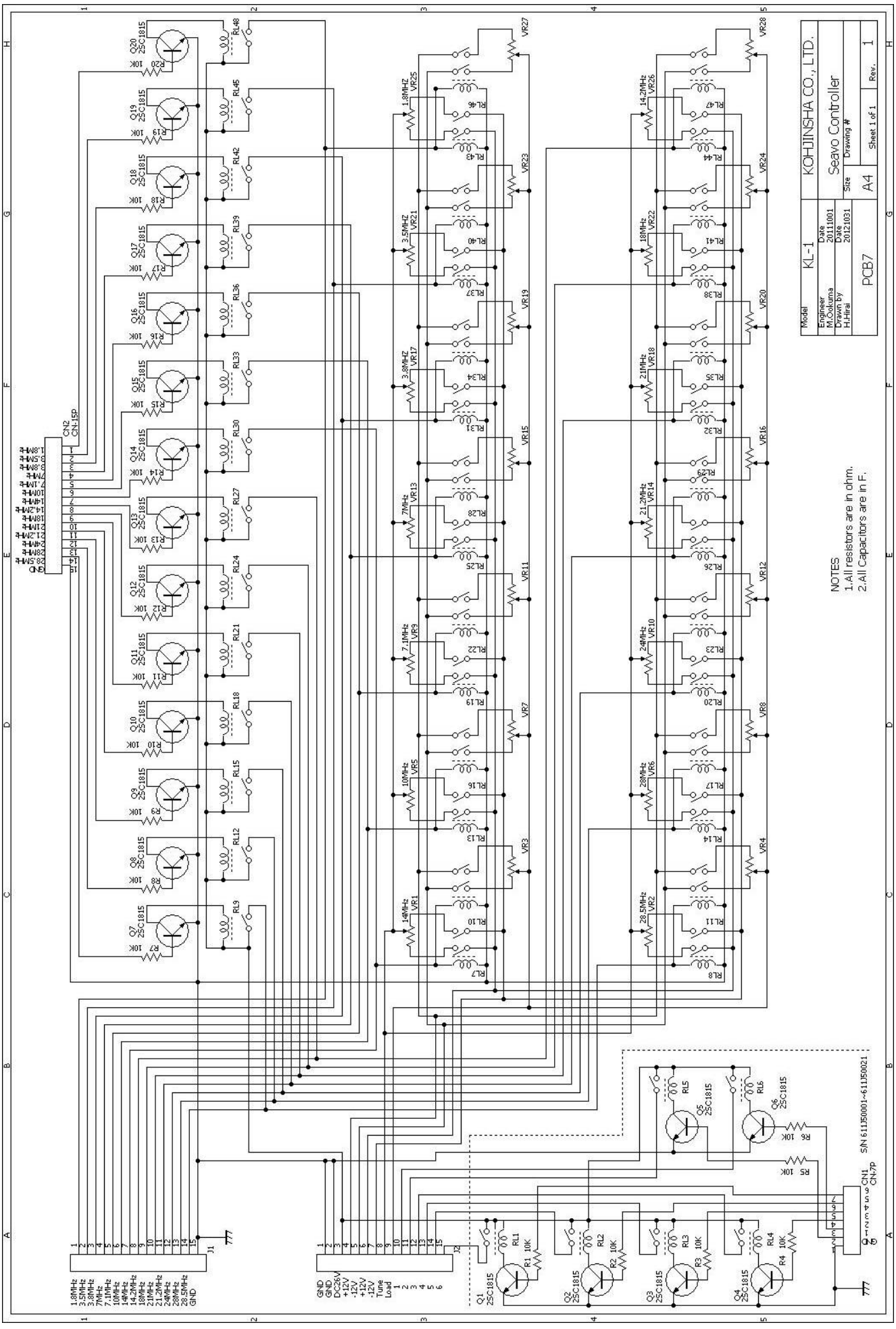

NOTES
1.All resistors are in ohm.
2.All Capacitors are in F.
Model KL-1
Date 20111001
KOHJINSHA CO., LTD.
Engineer M.Okuma
Date 20121031
Drawn by H.Hirai
Input Match
Size A4
Drawing # PCB2
Sheet 1 of 1
Rev. 1
RF IN
CATHODE
1.8MMHZ
3.5/3.8MHZ
7MHz
10MHZ
14MHZ
18MHz
21MHz
24MHz
28MHZ
J1

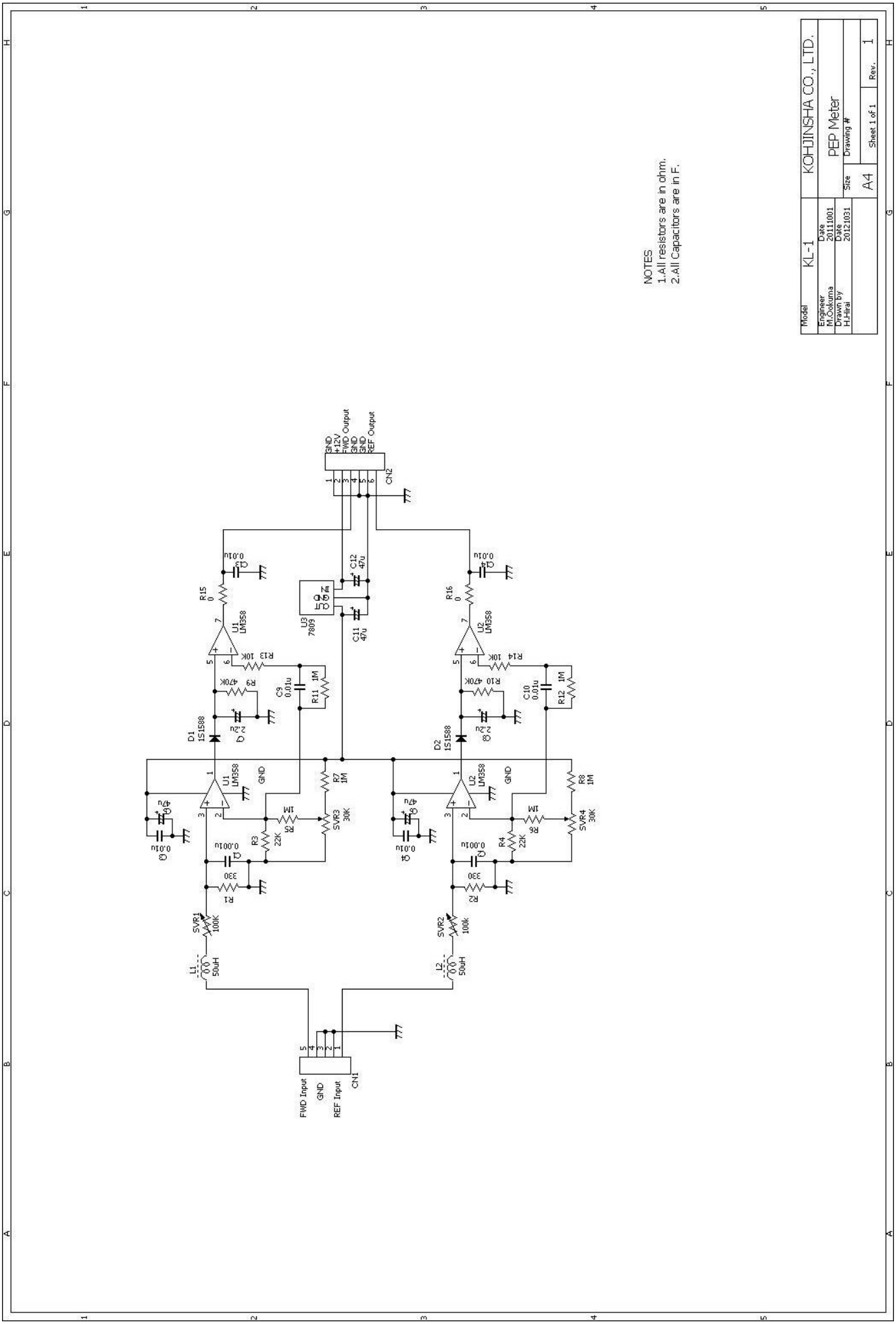

KOHJINSHA CO., LTD.
TX INHIBIT
KL-1
PCB3
A4
Sheet 1 of 1
Rev. 1
NOTES
1.All resistors are in ohm.
2.All diodes are 1N4007.
3.All Capacitors are in F.
J8 Band Data
J6 InputMatch
J7 Load RL
J1 PCB/J1a
Q1 2SC1815
GND

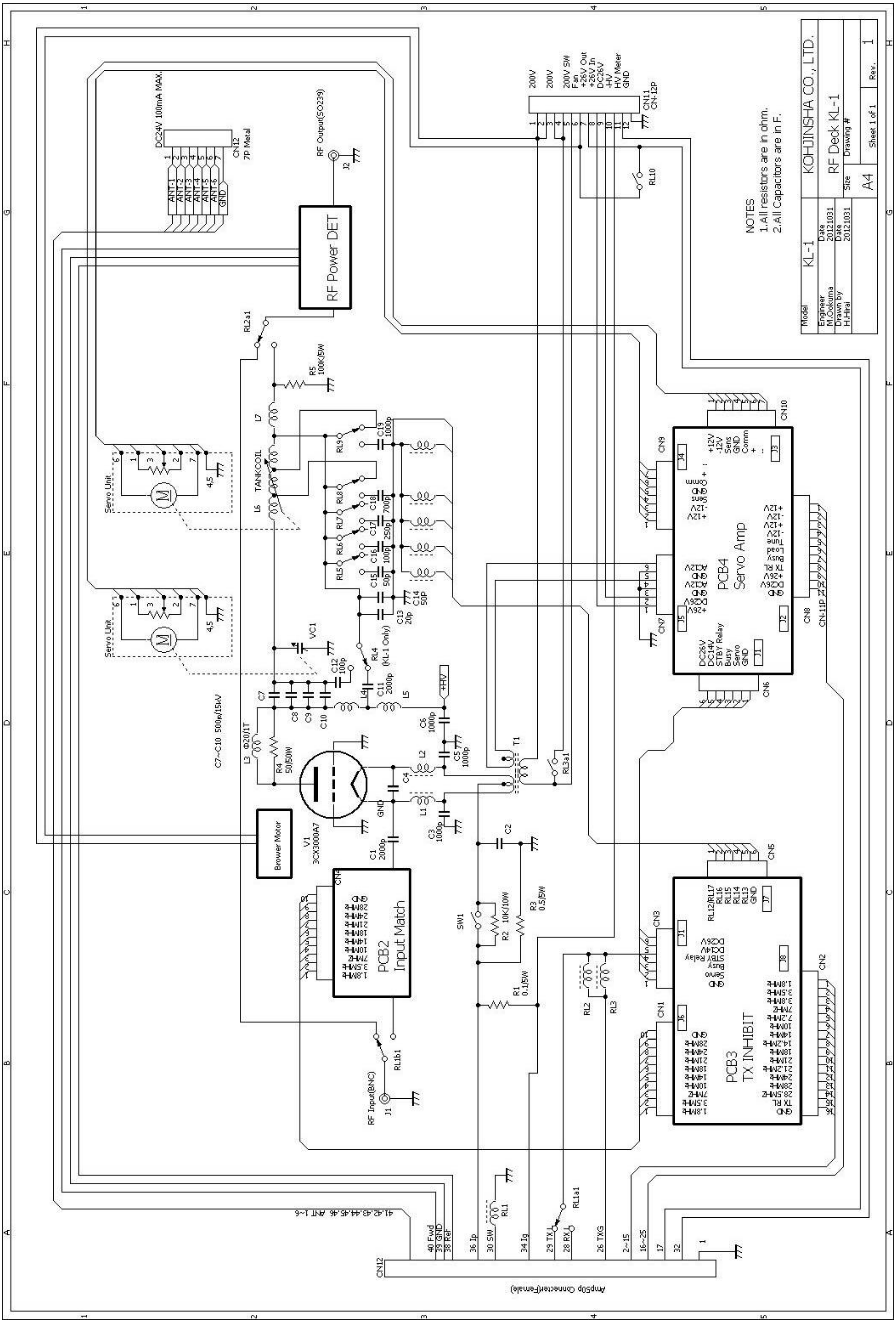

NOTES
1.All resistors are in ohm.
2.All Capacitors are in F.
Model KL-1
KOHJINSHA CO., LTD.
Engineer M.Ookuma
Date 20111001
Drawn by H.Hirai
Date 20121031
Servo Amp
Size A4
Drawing #
Sheet 1 of 1
Rev. 1
PCB4
J1 DC26V 14V STBY RL Busy Servo GND
J2 +12V -12V +12V -12V Tune Load Busy TX RL +26V DC26V GND
J3 Tune Motor +12V -12V Sens GND Comm Motor+ Motor-
J4 Load Motor +12V -12V Sens GND Comm Motor+ Motor-
J5 +26V DC26V GND AC12V GND AC12V
RL1 RL2 RL3 RL4 RL5
Q1 2SC1815 Q2 2SA1021 Q3 2SC1815 Q4 2SA1021
U1 NJM4580D
U2 7912
U3 7812
D1 D2 D3 D4 D5 1N4007 D6 1N4007
SW1-2 SW4 SW7 SW8
C15

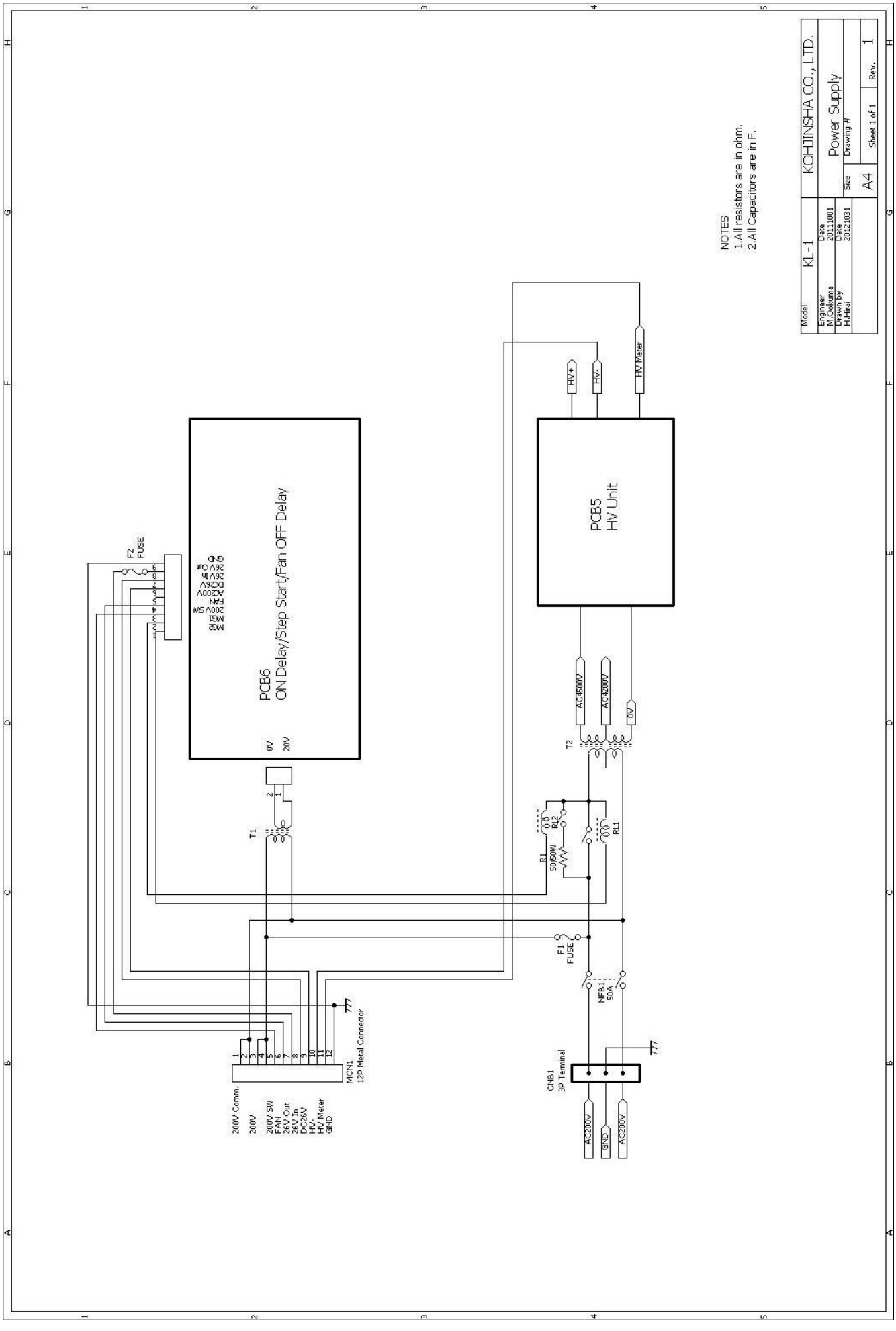


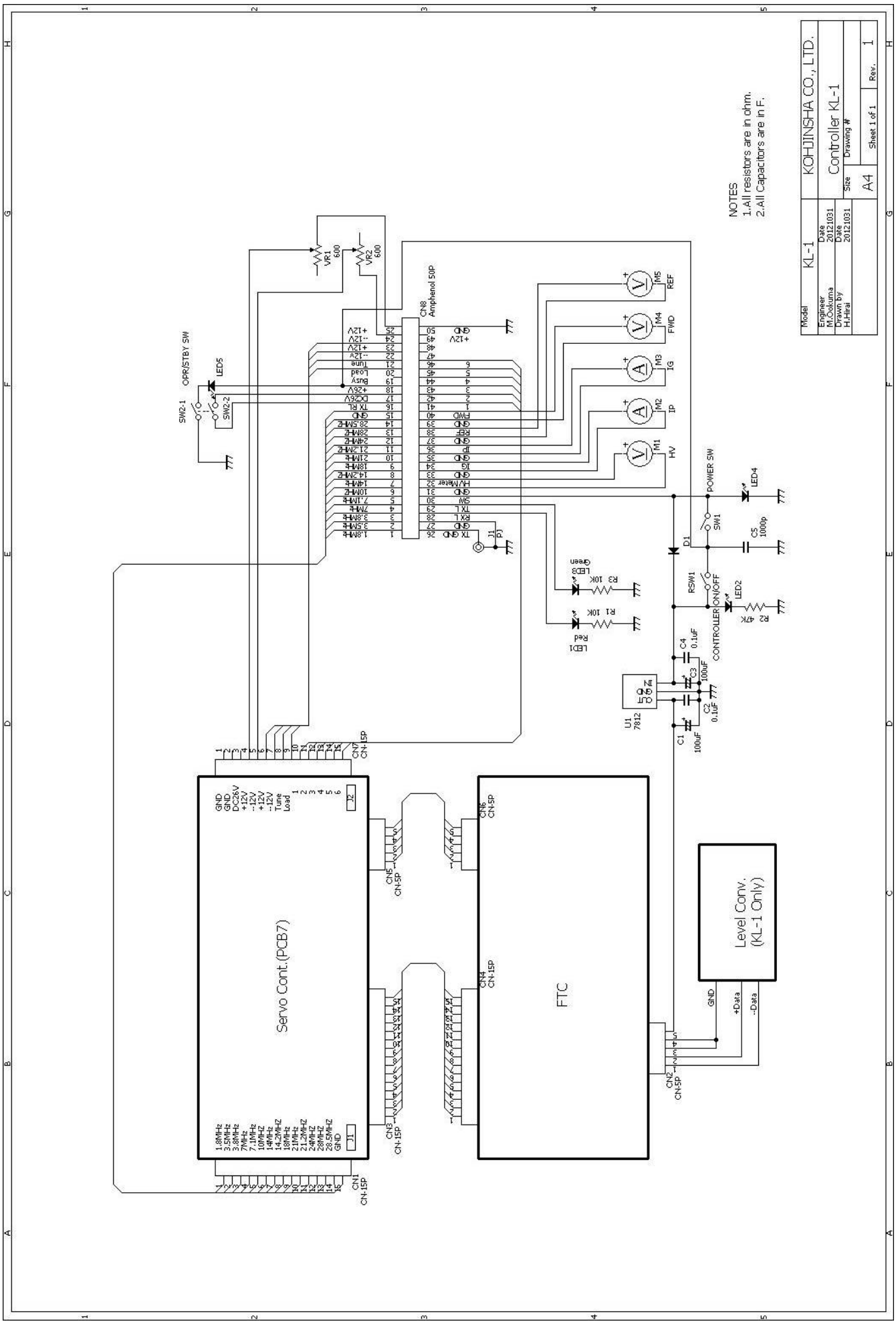
16. Schematic


KOHJINSHA CO., LTD.
Model KL-1
Servo Controller
Engineer M.Oduma
Date 20111001
Drawn by H.Hirai
Date 20121031
PCB7
Size A4
Drawing # 1
Sheet 1 of 1
Rev.
NOTES
1.All resistors are in ohm.
2.All Capacitors are in F.
CN2 CN-15P
CN1 CN-7P
J1
J2
S/N 611J50001-611J50021


NOTES
1.All resistors are in ohm.
2.All Capacitors are in F.
Model KL-1
Engineer M.Ookuma
Drawn by H.Hirai
Date 20111001
Date 20121031
KOHJINSHA CO., LTD.
PEP Meter
Size A4
Drawing #
Sheet 1 of 1
Rev. 1
GND
+12V
FWD Output
GND
GND
REF Output
CN2
FWD Input
GND
REF Input
CN1
U1 LM358
U2 LM358
U3 7809
D1 1S1588
D2 1S1588
L1 50uH
L2 50uH
SVR1 100K
SVR2 100k
SVR3 30K
SVR4 30K
R1 330
R2 330
R3 22K
R4 22K
R5 1M
R6 1M
R7 1M
R8 1M
R9 470K
R10 470K
R11 1M
R12 1M
R13 10K
R14 10K
R15 0
R16 0
C9 0.01u
C10 0.01u
C11 47u
C12 47u


KOHJINSHA CO., LTD.
RF Deck KL-1
Model KL-1
Engineer M.Ookuma
Drawn by H.Hirai
Date 20121031
Size A4
Sheet 1 of 1
Rev. 1
NOTES
1.All resistors are in ohm.
2.All Capacitors are in F.
RF Power DET
PCB4 Servo Amp
PCB3 TX INHIBIT
PCB2 Input Match
Brower Motor
Servo Unit
V1 3CX3000A7
RF Output(SO239)
RF Input(BNC)
CN12 7P Metal
DC24V 100mA MAX.
CN11 CN-12P
Amp50p Connecter(Female)
C7~C10 500p/15kV


NOTES
1.All resistors are in ohm.
2.All Capacitors are in F.
Model KL-1
KOHJINSHA CO., LTD.
Engineer M.Ookuma Date 20111001
Drawn by H.Hirai Date 20121031
Power Supply
Size A4
Drawing #
Sheet 1 of 1
Rev. 1
PCB6
ON Delay/Step Start/Fan OFF Delay
PCB5
HV Unit
F2 FUSE
F1 FUSE
T1
T2
R1 50/50W
RL1
RL2
NFB1 50A
CNB1 3P Terminal
MCN1 12P Metal Connector
AC200V
GND
AC200V
AC4500V
AC4200V
0V
HV+
HV-
HV Meter
200V Comm.
200V
200V SW
FAN
26V Out
26V In
DC26V
HV-
HV Meter
GND


NOTES
1.All resistors are in ohm.
2.All Capacitors are in F.
Model KL-1
KOHJINSHA CO., LTD.
Controller KL-1
Engineer M.Ookuma
Drawn by H.Hirai
Date 20121031
Size A4
Drawing #
Sheet 1 of 1
Rev. 1
Servo Cont.(PCB7)
FTC
Level Conv. (KL-1 Only)
POWER SW
CONTROLLER ON/OFF
OPR/STBY SW
CN8 Amphenol 50P
CN1 CN-15P
CN2 CN-5P
CN3 CN-15P
CN4 CN-15P
CN5 CN-5P
CN6 CN-5P
CN7 CN-15P
VR1 600
VR2 600
M1 HV
M2 IP
M3 IG
M4 FWD
M5 REF
LED1 Red
LED2
LED3 Green
LED4
LED5
R1 10K
R2 47K
R3 10K
C1 100uF
C2 0.1uF
C3 100uF
C4 0.1uF
C5 1000p
D1
U1 7812
SW1
SW2-1
SW2-2
RSW1
J1
J2
J3
GND
+Data
-Data

17. Trouble Shooting

Symptom	Cause	Remedy	Ref.
Amplifier will not turn power on.	Plug or cable connection may be loose.	Check connecting point and make sure connected firmly.	P5 P9
	Remote control cable intermittent	Make sure connectors are firmly plugged into the end.	P8 P10
OPR LED will not on when PTT is pressed.	Broken or wrong wiring of TX control cable.	Check your TX control cable.	P8 P10
	Read your transceiver manual. They may have different TX control system.	Find the right place to connect that goes to GND when transmitted.	P8
No output power.	Insufficient exciter power	Adjust exciter RF POWER	
	Broken or wrong wiring of TX control cable.	Check your TX control cable.	P10
	No load to ANT connector.	Connect an antenna or a dummy load to antenna connector.	P5 P10
	The antenna is not connected to the right antenna connector number that is shown on the display.	Re-setup antenna selector setting.	P27
	No power on controller.	Press POWER button or turn CONTOROLLER switch to power on.	P6
KL-1 will not power up	Maximum exciter output power is insufficient to drive KL-1.	Change your exciter so that KL-1 gets its full performance.	
	AC line voltage goes down.	Check wiring. KL-1 requires more than AWG#8 wire.	
	KL-1 is set RF through.	Press OPERATION switch.	P6