

**INSTRUCTION
MANUAL
FP-301D**

YAESU MUSEN CO., LTD.

TOKYO JAPAN.

FP - 301 D POWER SUPPLY
INSTRUCTION MANUAL



GENERAL

The FP-301D Power Supply has been designed for use in conjunction with the FT-301 series of all solid state transceivers. It consists of a DC regulated power supply, automatic ID circuit, digital clock and speaker.

The FP-301D delivers a 13.5V regulated DC voltage with maximum current capacity of 25 amperes and it may be operated from 100/110/117/200/220/234 volts AC 50/60 Hz when a transformer primary winding is appropriately wired.

The automatic ID circuit transmits the identification signal (coded call sign) every ten minutes automatically or manually.

The digital clock displays hours, minutes and seconds by either a 12-hour or 24-hour system. Either system can be selected by a switch on the front panel.

NOTE: The Integrated Circuit for ID is optional and not supplied with the FP-301D.

SPECIFICATIONS

Output Voltage	-	13.5V regulated
Output Current	-	Maximum 25A
Digital Clock	-	6 digit LED display
Clock Frequency	-	50 or 60 Hz synchronized to AC supply voltage
Calibration	-	Fast/Slow or Hold
ID Memory Capacity	-	247 bits
Speaker	-	4 ohms, 3 watts
Power Requirement	-	100/110/117/200/220/234 volts AC 50/60 Hz
Size	-	210(W) x 125(H) x 295(D) m/m
Weight	-	app. 10 kg

SEMICONDUCTOR COMPLEMENT

Transistors

2SC509	(6)	2SC114Y	(4)
2SC372Y	(7)	MPSA13	(2)
2SC373	(2)		

ICs

MC7805	(1)	SN7400N	(3)
MC14011	(1)	SN7425N	(1)
MC14566CP	(1)	SN7490AN	(1)
MC14572CP	(2)	SN7493N	(2)
MM5313N	(1)	SN74151N	(1)
MC14023	(1)	SN74188A	(1) optional
		or SN74S188	

Diodes

1N60FM	(8)	12CD12	(2)
12CC12	(2)	V06C	(2)

LEDs

TLR104	(1)	TLR312	(6)
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INSTALLATION

To achieve trouble-free operation for both the FP-301D and the FT-301, proper location of the FP-301D is very important. Allow adequate space on all sides of the unit to assure proper ventilation around the cabinet.

Avoid installation of the FP-301D in the following areas:

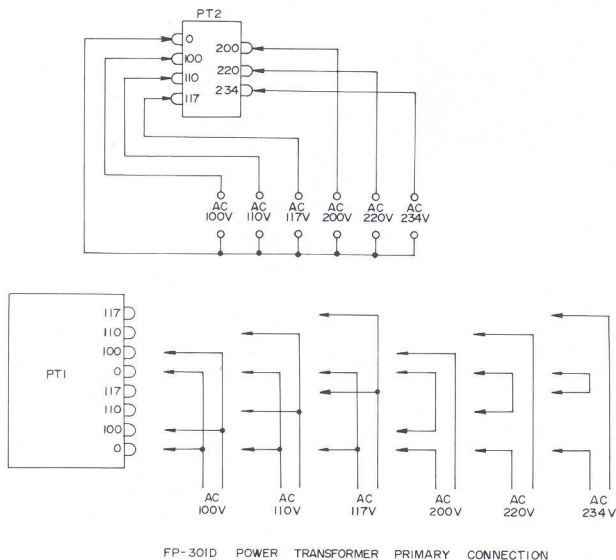
- (1) Under direct sunlight or near a heating system.
- (2) Humid area.
- (3) Dusty area.
- (4) Poorly ventilated area.
- (5) Unstable area.

Do not put anything on the FP-301D and do not stack the power supply on the transceiver.

The FP-301D is designed for use in many areas of the world using supply voltages which may differ from the operator's local supply voltage. Therefore, prior to connecting the AC cord to the power outlet, be sure that the transformer primary voltage agrees with the local AC supply voltage.

CAUTION

PERMANENT DAMAGE WILL RESULT IF
IMPROPER AC SUPPLY VOLTAGE IS
APPLIED TO THE FP-301D.



FP-301D POWER TRANSFORMER PRIMARY CONNECTION

Figure 1

AUTOMATIC ID INSTALLATION

The Integrated Circuit (SN74188A or SN74S188) is OPTIONAL and is not supplied with the FP-301D. If you wish to purchase the IC, it will be available through our agents who would have to program it for you as this procedure requires special tools. The IC can be programmed to your specifications, within its capacity, to produce an ID signal, such as your call sign.

To install programmed IC, locate ID printed board PB-1529 and insert the IC to its socket as illustrated in Fig. 3. Please be very careful to insert IC correctly as permanent damage will result to IC if it is inserted upside down.

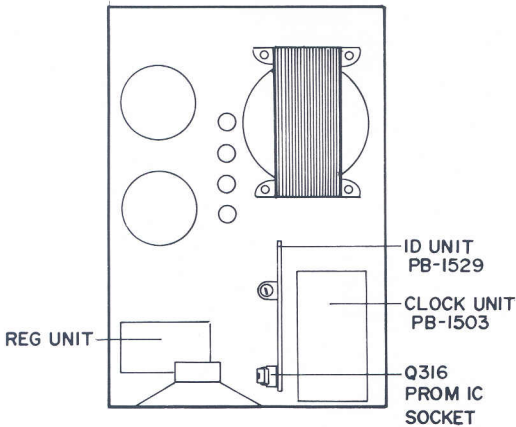


Figure 2

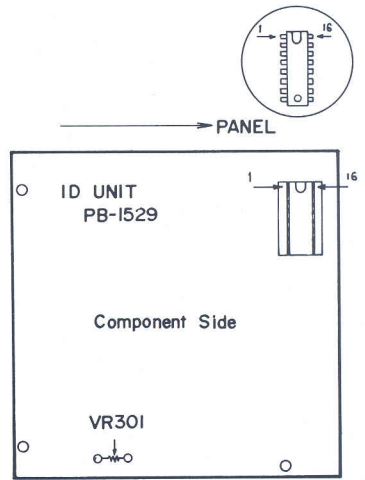
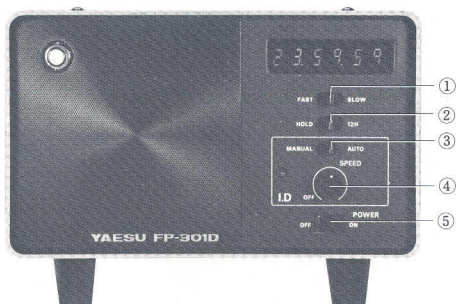


Figure 3

OPERATION

SWITCHES & CONTROLS



- | | | | |
|-----|-------------|---|--|
| (1) | FAST/SLOW | - | A 3-position switch used to set time. At center position, digital clock works manually. |
| (2) | HOLD/12H | - | A 3-position switch used to set time and to select 12-hour or a 24-hour system. At HOLD position, clock stops to set correct time. At center, the clock works on a 24-hour system and at 12H, clock works on a 12-hour system. |
| (3) | MANUAL/AUTO | - | A switch for ID transmission. It stops at AUTO position normally, and ID is transmitted every 10 minutes automatically. The ID signal is also transmitted when this switch is turned to the MANUAL position. |
| (4) | SPEED | - | This potentiometer adjusts the speed of the ID transmission. Clockwise rotation increases speed. At "off" position, the ID system is completely unoperative.

When optional IC is not in the socket, this potentiometer should be set to OFF position. |
| (5) | POWER | - | This switch turns ON and OFF the power to the power supply. |

Set the POWER switch of FP-301D to OFF position. Plug a connector of FP-301D to a receptacle on rear panel of the FT-301 transceiver. All connections, such as external speaker, power, and monitor circuit are completed.

CAUTION

IMPROPER SUPPLY OF AC VOLTAGE WILL RESULT IN PERMANENT DAMAGE TO THE UNIT. PRIOR TO CONNECTING THE PLUG TO THE POWER OUTLET, MAKE SURE THE FP-301D IS WIRED TO AGREE WITH THE LOCAL AC SUPPLY VOLTAGE.

SETTING OF THE DIGITAL CLOCK

The digital clock is synchronized to the frequency of the local power supply, 50 or 60 Hz. A frequency selector switch is located on the bottom of the FP-301D.

Please note, however, that our earlier models of the FP-301D do not have the selector switch and, therefore, the following modification is required if the clock makes an error of more than 5 minutes per hour.

- (1) Unplug the cord from the power supply outlet.
- (2) Remove 6 screws on the front end and 4 screws on the rear end of the cabinet and slide the chassis out from the cabinet.
- (3) Locate printed board PB-1503. Refer to Fig. 2. Pin 9 of the printed board has been connected to pin 4 for 60 Hz. Disconnect the wire between pin 9 and pin 4 for 50 Hz use.
- (4) To convert from 50 Hz to 60 Hz, connect pin 9 to pin 4 with a wire.
- (5) Recover the cabinet.

CAUTION

THE CLOCK DOES NOT DISPLAY PROPERLY WHEN THE 12-HOUR SYSTEM IS SELECTED FROM THE 24-HOUR SYSTEM AFTER 13:00 HOURS.

TIME SETTING

Set HOLD/12H switch to center position (24H). Use FAST/SLOW switch to set display to desired time. Depress HOLD switch to stop display at desired time to be set. Wait until the correct time reaches the displayed time and immediately release HOLD switch. The clock will continue to operate normally.

For 12-hour system, set HOLD/12H switch to 12H position.

AUTOMATIC ID OPERATION

Acquire programmed IC from the dealer and install it to the socket as described earlier. Advance the control marked SPEED to the 12 o'clock position.

Tune the transceiver on SSB mode in transmit. Set the MAN/AUTO switch to MAN position. The transmitted ID signal is heard through the speaker. Adjust the SPEED control to desired code speed.

The ID signal is transmitted every 10 minutes after transmitter is keyed on SSB and AM modes.

NOTE: The 10 minute time intervals are started when the transmitter is keyed, therefore, transmitter should be keyed continuously without any break for 10 minutes for automatic ID transmission.

The ID signal is also transmitted when the MAN/AUTO switch is set to MAN position.

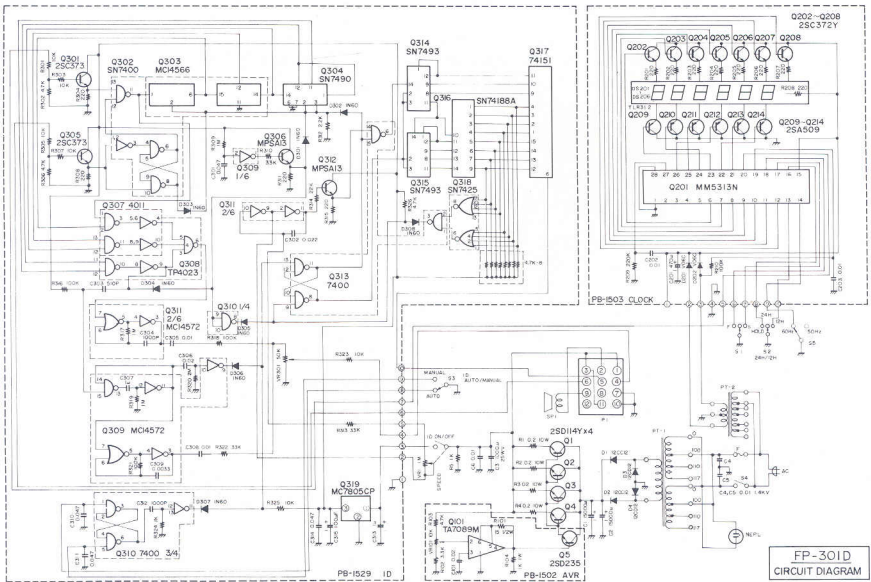
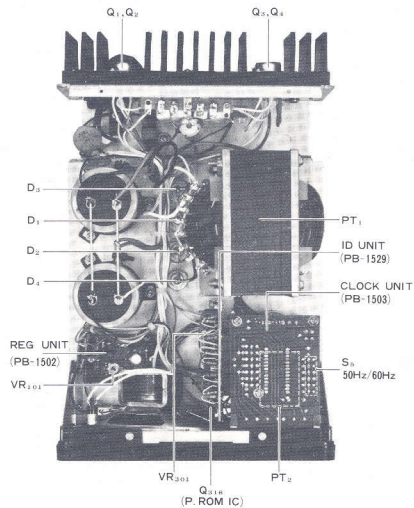


Figure 4



CIRCUIT DESCRIPTION

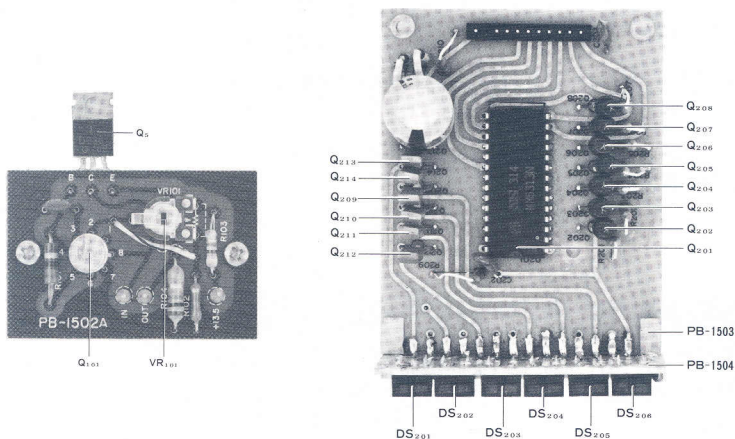
The FP-301D Power Supply consists of a regulated power supply unit, a digital clock unit and an automatic ID circuit.

(1) Regulated Power Supply

The secondary winding of the power transformer PT1 is connected to a bridge type solid state rectifier D1, D2, 12CC12 and D3, D4, 12CD12 to supply DC voltage for the voltage regulator circuit consisting of Q5, 2SD235 and Q1-Q4, 2SD114Y.

The base voltage of Q5 is stabilized by Q101, TA7089M and the output voltage can be adjusted by VR101 which is normally set to 13.5 volts DC.

A separate transformer PT2 is used to supply the necessary voltage to the digital clock unit regardless whether the power switch is ON or OFF to keep the clock running. The 13.5 volts AC voltage from the transformer is rectified by D201 and D202, V06C for the clock circuit.



(2) Digital Clock

A digital clock integrated circuit Q201, MM5313N controls the 7-digit display LED through LED driver, Q202-Q208, 2SC372Y and Q209-Q214, 2SA509.

The 13.5 volts AC voltage is applied through R201 to pin 19 of Q201 for the timekeeping function. The counter is programmed for 60 Hz operation by connecting pin 9 to ground. The 12-hour display format is selected by connecting pin 13 to ground.

(3) Automatic ID Circuit

The automatic ID circuit consists of a time code memory readout, monitor oscillator and control circuits.

The timer circuit receives 1 second pulses from the clock circuit and it produces a 600 second pulse by Q301, 2SC373, Q302, SN7400N, Q303, MC14566 and Q304, SN7490N.

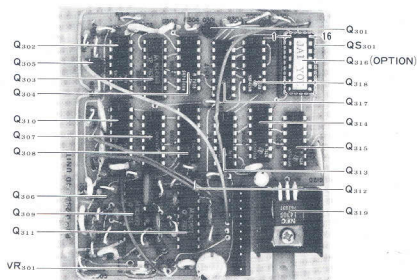
Q307, TP4011, Q308, TP4023 and Q311, MC14572 produce a 1000 Hz warning signal which is monitored by a speaker at 3 seconds prior to transmission of ID signal. Q309, MC14572 generates a 2000 Hz warning signal. A one-shot multivibrator output from Q309 produces the start signal for memory readout by Q313, SN7400N. Manual readout is done by Q310, SN7400N.

Q311, MC14572 is used for adjustment of code speed and its output is fed through a buffer Q312, MPSA13 to code start gate Q313. Q309, MC14572 and Q306, MPSA13 are used as a delay circuit to prevent the transmission of ID signal when the power switch is ON.

Q314, Q315, SN7493N and Q317, SN74151N read the memory in order stored in Q316, SN74188A.

The entire circuit is reset when the "END" code from Q316 is received by Q318, SN7425N and a part of Q313.

The 13.5 volts DC voltage for the ICs is regulated at 5 volts by a regulator Q319, MC7805CP.



FP-301D PARTS LIST

MAIN CHASSIS			
Q	TRANSISTOR		103 1/2W 4.7KΩ 104 1W 1KΩ
1~4		2SD114Y	
POTENTIOMETER			
D	DIODE		VR EVL-S3A 00B14 10KΩB
1,2		12CC12	
3,4		12CD12	
CAPACITOR			
R	RESISTOR		102 CERAMIC DISC 50WV 0.01μF
	WIRE WOUND		MYLAR 50WV
1~4		10W 0.2Ω	101 50WV 0.02μF
	CARBON COMPOSITION		
5		1/2W 1KΩ	
CLOCK UNIT			
VR	POTENTIOMETER		PB PRINTED CIRCUIT BOARD
1	EVH-COBS	15B26 2MΩB	1503A CLOCK BOARD 1504 DISPLAY BOARD
CAPACITOR			
C	CAPACITOR		Q IC & TRANSISTOR
	CERAMIC DISC		201 IC MM5313N
6		50WV 0.01μF	209~214 Tr 2SA509
4,5		1.4KV 0.01μF	202~208 2SC372Y
	ELECTROLYTIC		
3		25WV 1000μF	
1,2		1.4KV 15000μF	
POWER TRANSFORMER			
PT	POWER TRANSFORMER		D DIODE
1		52-39	201, 202 Si V06C
2		52-42	
SPEAKER			
SP	SPEAKER		DS LED DISPLAY
1		SM-128 4Ω	201~206 TLR312
SWITCH			
S	SWITCH		R RESISTOR
1	FAST/SLOW	SLE82301	201~208 1/4W 220Ω
2	HOLD/12H	SLE22301	210 100KΩ
3	MANUAL/AUTO	SEL22251	209 220KΩ
4	POWER	WD2101	
5	50Hz/60Hz	SSF-22-08	C CAPACITOR
	SWITCH BOARD (PB-1649)		202, 203 MYLAR 50WV 0.01μF
			ELECTROLYTIC
			201 25WV 470μF
PILOT LAMP			
NE	PILOT LAMP		P/J PIN CONNECTOR
1	NEON	PN-12	201 M31-10-60-114P
RECEPTACLE			
J	RECEPTACLE		
1		QMS-P12FK	
LED BOARD (PB-1390)			
	LED	TLR-104	ID UNIT
			PB PRINTED CIRCUIT BOARD
			1529(A~Z) ID BOARD
FUZE			
F	FUZE		Q IC & TRANSISTOR
1		6A(100V~117V)	319 IC MC7805CP
		3A(200V~234V)	307 TP4011
			308 TP4023
FUZE HOLDER			
FH	FUZE HOLDER		303 MC14566CP
1		SN-1001 #2	309, 311 MC14572CP
			302, 310, 313 SN7400N
			318 SN7425N
			304 SN7490AN
			314, 315 SN7493N
			317 SN74151N
			318 SN74188AN(OPTION)
REG UNIT			
PB	PRINTED CIRCUIT BOARD		301, 305 Tr 2SC373
1502A			306, 312 MP5A13
IC & TRANSISTOR			
Q	IC & TRANSISTOR		D DIODE
101		IC TA7089M	301~308 Ge (GB)1N60FM
102		Tr 2SD235	
RESISTOR			
R	RESISTOR		R RESISTOR
	CARBON COMPOSITION		CARBON FILM
101		1/2W 15Ω	
102		3.3KΩ	

304, 308, 311, 312, 315	¼W	220Ω	VR	POTENTIOMETER	
324	″	1KΩ	301	V10K8	50KΩB
302, 306, 326	″	4.7KΩ			
301, 303, 305, 307, 323, 325	″	10KΩ	QS	IC SOCKET	
314	″	22KΩ	301	316 · AG-37D	
310, 313, 322	″	33KΩ			
316, 318, 321, 327	″	100KΩ	P/J	PIN CONNECTOR	
309, 317, 319	″	1MΩ	301	M31-10-60-114P	
320	″	2.2MΩ			
RB	BLOCK RESISTOR				
301		4.7KΩ×8			

