FTH-2006
SERVICE MANUAL

This booklet contains supplemental technical information related to the FTH-2006 for use with the FTH-2006 Operating Manual. Service or repairs to the FTH-2006 transceiver should be performed by pualified technicians only.

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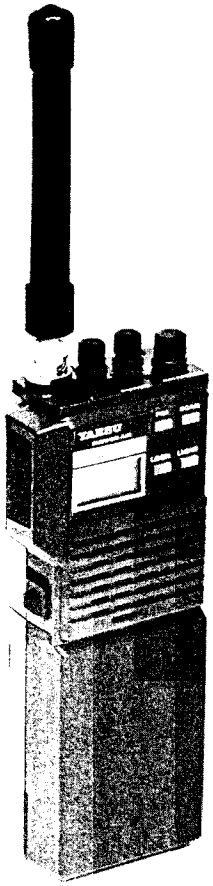
FTH-2006 SERVICE MANUAL



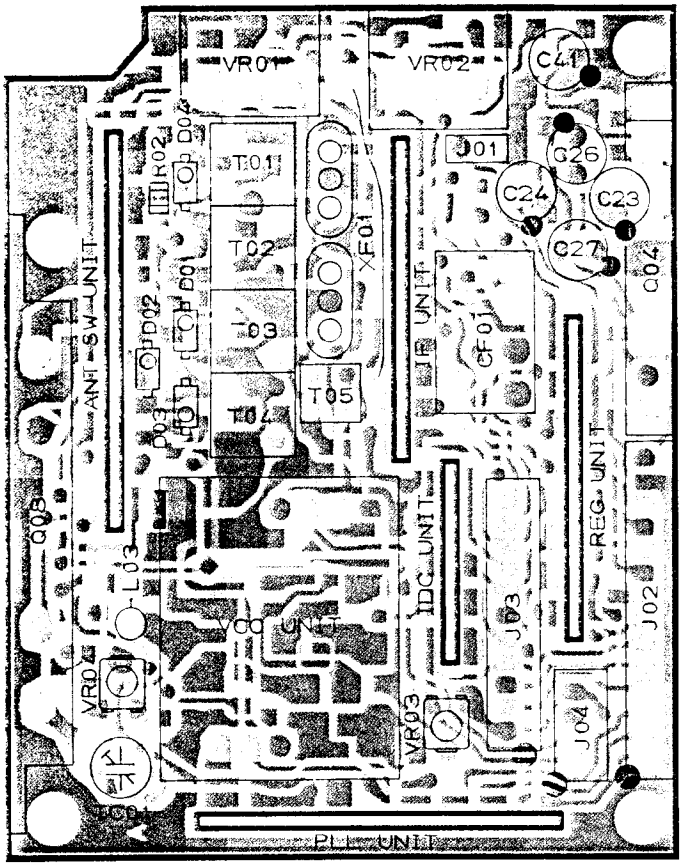
This manual is intended to serve as a supplement to the FTH-2006 Operating Manual. Detailed information regarding functions, specifications, options and operation has been provided in the Operating Manual, and is not reprinted herein. Therefore, this manual is not intended to serve as an independent reference, but to be used in conjunction with the information provided in the Operating Manual.

Because of the compactness and complexity of the double-sided glass-epoxy circuit boards used in the FTH-2006, four layout diagrams are provided for each board. Each side of the board is identified by the type of the majority of components installed on that side. In most cases one side has only chip components, and the other has either a mixture of both chip and lead components (trimmers, coils, electrolytic capacitors, packaged ICs, etc.), or lead components only. The two "obverse" views depict the board as it is seen when viewed directly with the eye, while the two "reverse" views depict the unseen side of the board as it would appear if one were to peer through the board from the other side without seeing the components and tracks on the near side.

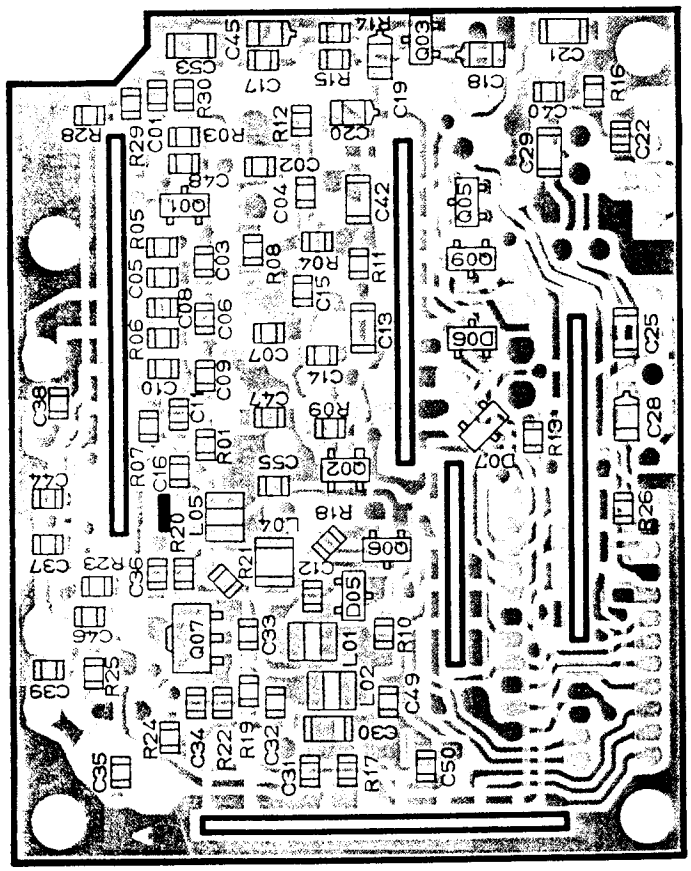
While we believe the technical information in this manual is correct, Yaesu assumes no liability for damage that may occur as a result of typographical or other errors that may be present. Your cooperation in pointing out any inconsistencies in the technical information would be appreciated.

Yaesu Musen reserves the right to make changes in the circuitry of this transceiver, in the interest of technological improvement, without notification of the owners.

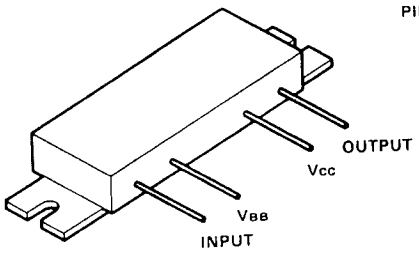
MOTHER BOARD



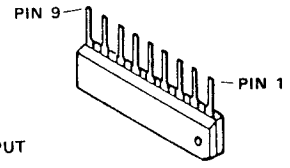
(Obverse view of "component" side)



(Reverse view of "chip" side)



M57796(Q208)



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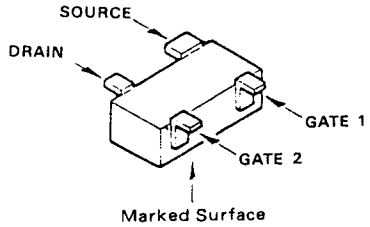
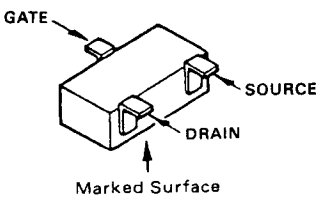


3SK151GR(UH)(Q202)



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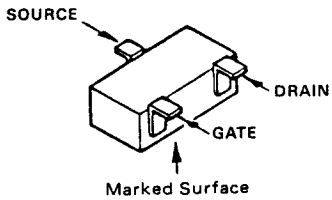

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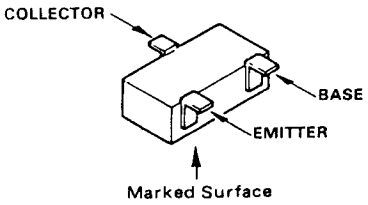
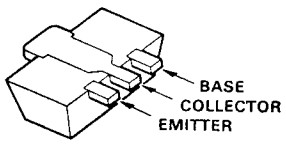


2SC3356(R22)(Q206)
FA1L4M(L31)(Q205,209)



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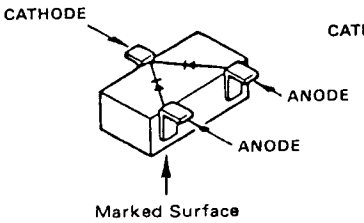
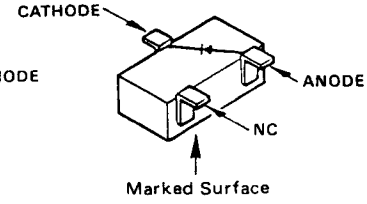
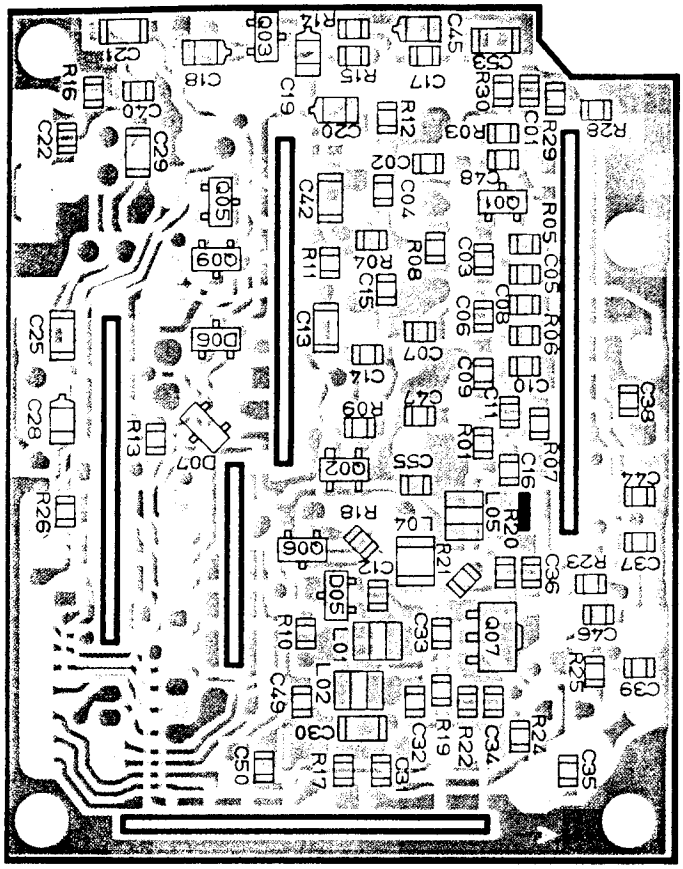


1SS184(B3)(D205,207)

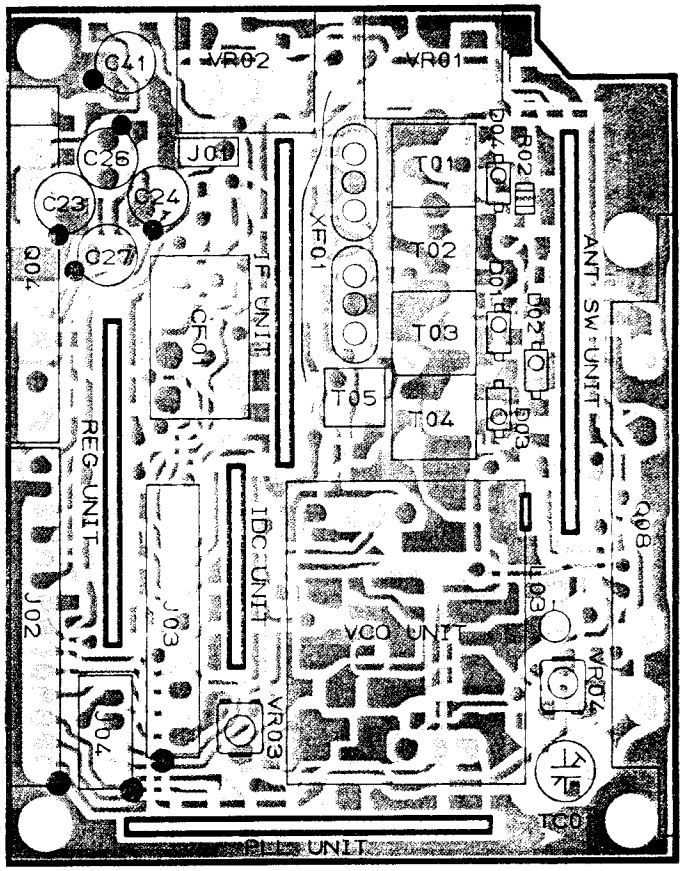


1SS193(F3)(D206)

MOTHER BOARD



(Obverse view of "chip" side)



(Reverse view of "component" side)

MOTHER BOARD VOLTAGE CHART (DC VOLTS)

	1	2	3	4	5	6	7	8	9	REMARKS
Q204	0.7	0	0.6	4.4	0	3.9	7.4	7.4	7.4	RX
Q208	0	0/4.9	12.0	0						RX/TX

	E (S)	C (D)	B (G_1)	(G_2)	REMARKS
Q201	0.3	4.7	0		
Q202	0	4.1	0	0	
Q203	4.7	4.7	4.7		
Q205	0	4.3/0	0		RX/TX
Q206	0	3.1/7.4	0.7		RX/TX
Q207	0/0.7	0/10.7	0/1.0		RX/TX
Q209	0	0	4.4		

For Service Manuals Contact
MAURITRON TECHNICAL SERVICES
8 Cherry Tree Rd, Chinnor
Oxon OX9 4QY
Tel:- 01844-351694 Fax:- 01844-352554
Email:- enquiries@mauritron.co.uk

	1/ +B	2/ Vcc	REMARKS
J201	12.0	12.0	

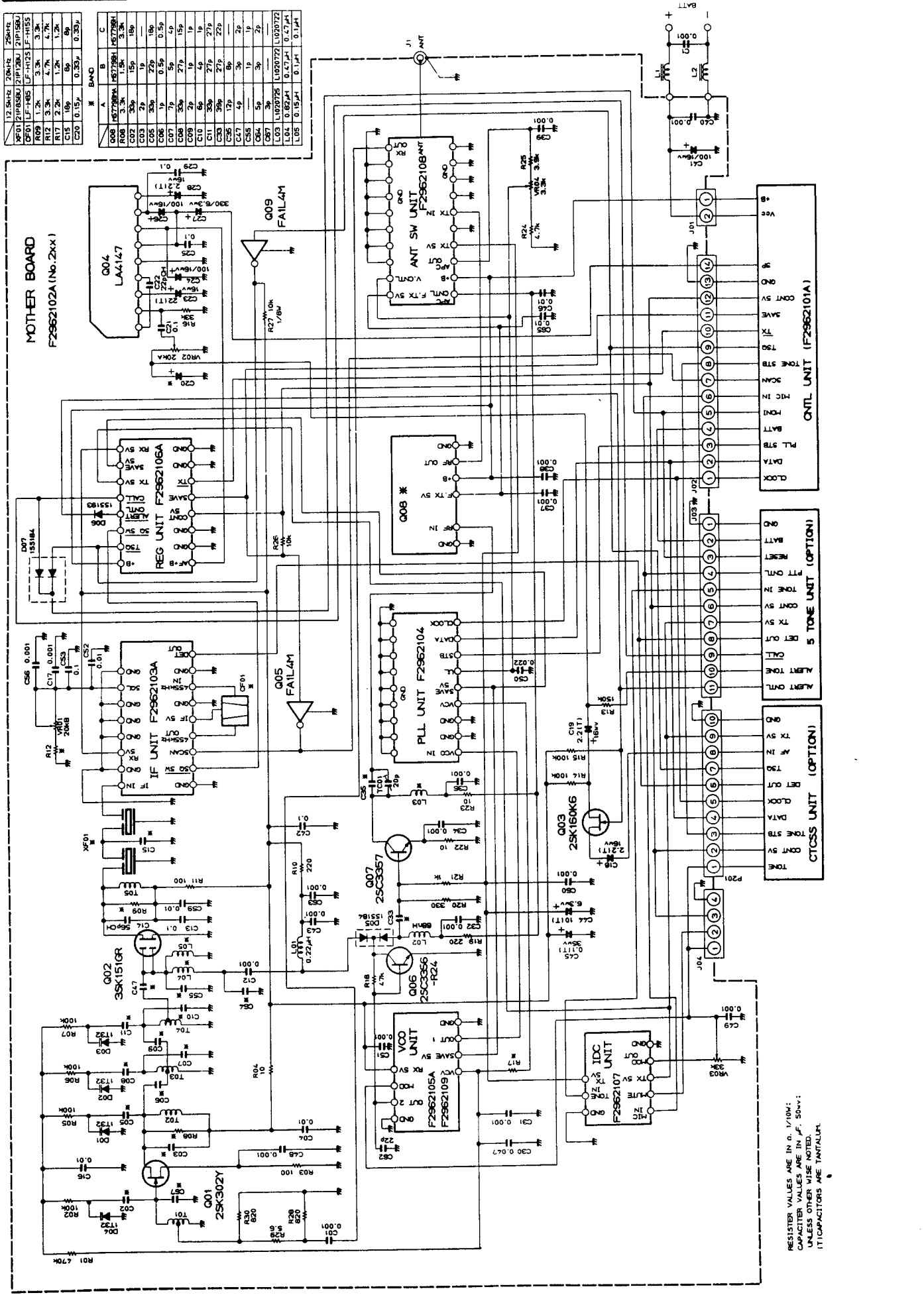
	1/ CLOCK	2/ DATA	3/ PLL STB	4/ BATT	5/ MONI	6/ MIC IN	7/ SCAN	8/ TONE STB	9/ T SQ	10/ TX	11/ SAVE	12/ CONT 5V	13/ GND	14/ SP	REMARKS
J202	0	0	0	3.2	0	5.0/2.8	4.3/0	0	4.4	4.4/0	0	5.0	0	0	RX/TX

	1/ GND	2/ BATT	3/ RESET	4/ PTT CNTL	5/ TONE IN	6/ CONT 5V	7/ TX 5V	8/ DET OUT	9/ CALL	10/ ALERT TONE	11/ ALERT CNTL	REMARKS
J203	0	3.2	0	5.0/2.8	0	5.0/0	0/4.8	1.2/0	0	0	4.7/0	RX/TX

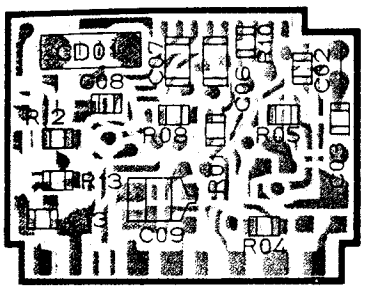
	1/ DTMF	2/ MUTE	3/ CONT 5V	4/ GND	REMARKS
J204	0/0.3	0/1.8	5.0	0	RX/TX

	1/ TONE	2/ CONT 5V	3/ TONE STB	4/ DATA	5/ CLOCK	6/ DET OUT	7/ T SQ	8/ AF IN	9/ TX 5V	10/ GND	REMARKS
P201	0	5.0	0	0	0	1.2/0	4.4	1.2/0	0/4.8	0	RX/TX

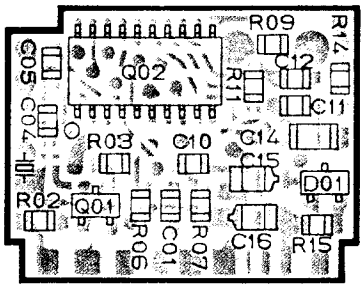
MOTHER BOARD



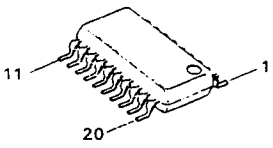
IF UNIT



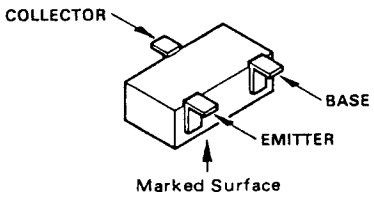
(Obverse view of "mixed-component" side)



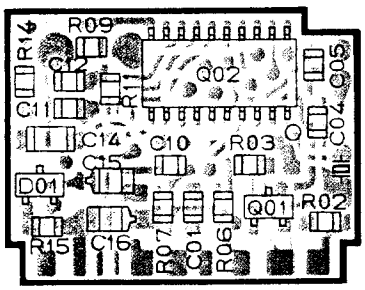
(Obverse view of "chip-only" side)



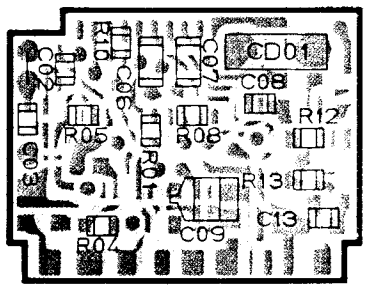
TK10485M(Q302)



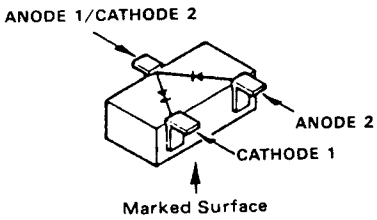
2SC2620(QB)(Q301)



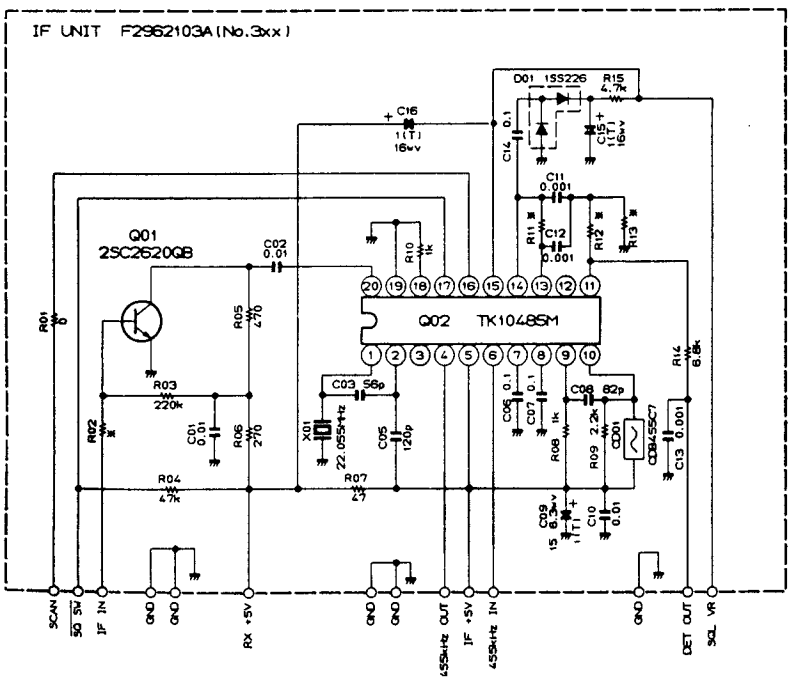
(Reverse view of "chip-only side)



(Reverse view of "mixed-component" side)



1SS226(C3)(D301)



* SEPARATION

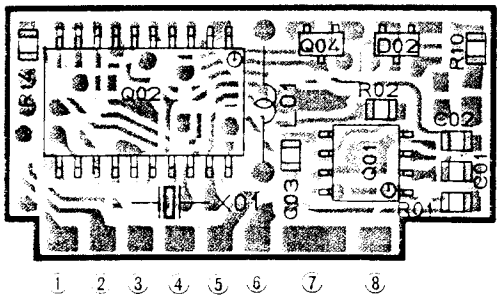
	20k/25kHz	12.5kHz
R02	1.5k	1k
R11	470k	330k
R12	22k	15k
R13	1.2k	3.3k

RESISTOR VALUES ARE IN Ω, 1/10W;
CAPACITOR VALUES ARE IN μF, 50WV;
UNLESS OTHERWISE NOTED.
(T)CAPACITORS ARE TANTALUM.

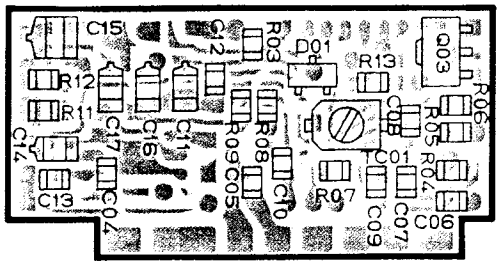
Mixed-Component Side (DC VOLTS)									
1 DET OUT	2 GND	3 455kHz IN	4 GND	5 IF 5V	6 455kHz OUT	7 SCAN	8 SQ SW	9 GND	REMARKS
1.2/0	0	3.5/0	0	4.4/0	4.1/0	4.2/0	0	0	RX/TX

Chip-Only Side (DC VOLTS)						
1 GND	2 SQL	3 GND	4 RX 5V	5 GND	6 IF IN	REMARKS
0	0	0	4.7/0	0	0.7/0	RX/TX

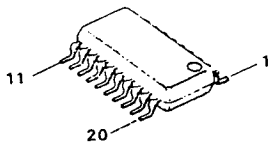
PLL UNIT



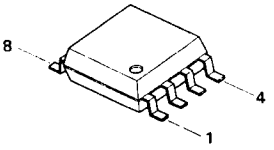
(Obverse view of "mixed-component" side)



(Obverse view of "chip-only" side)



JLC1007P(Q402)



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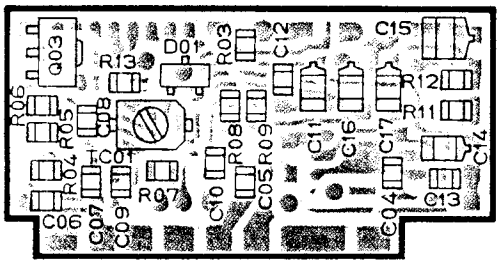
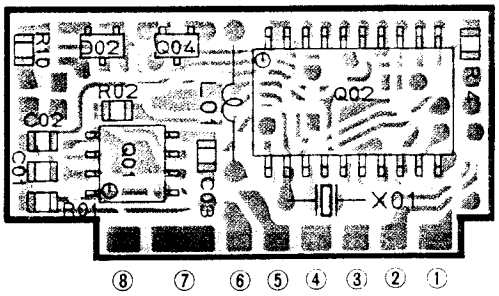
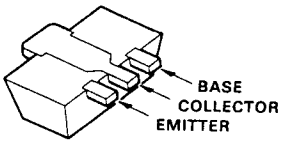


(Reverse view of "chip-only side)



(Reverse view of "mixed-component" side)



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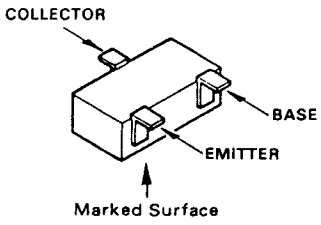

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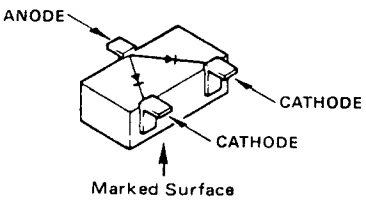

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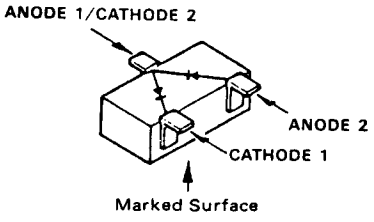

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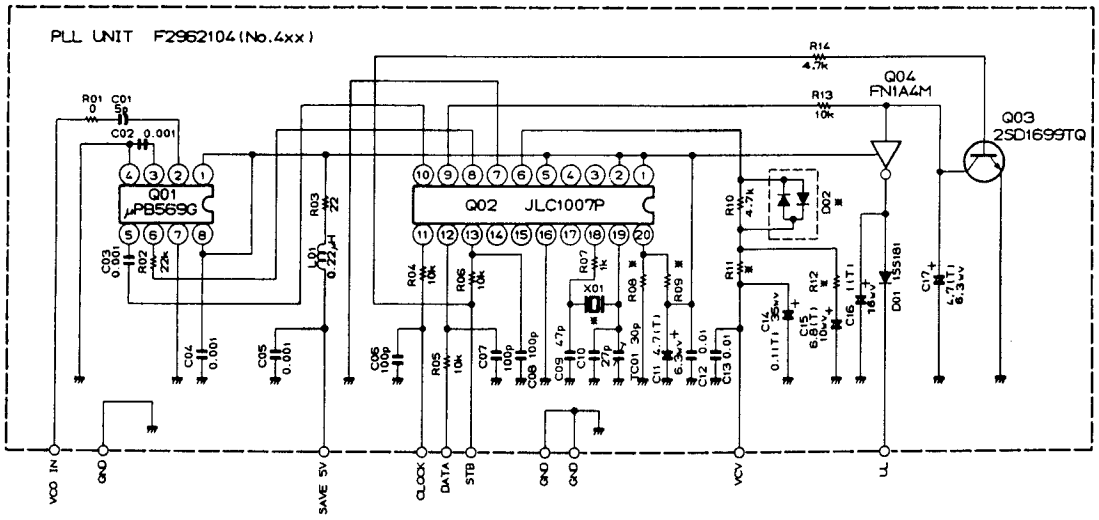
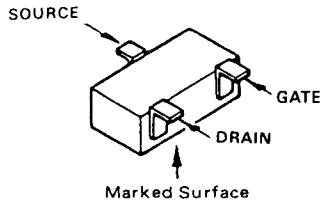


✱ SEPARATION		
	20k/25kHz	12.5kHz
D02	1SS226	—
X01	10.24MHz	12.8MHz
R08	—	0
R09	0	—
R11	15k	10k
R12	2.2k	1.5k

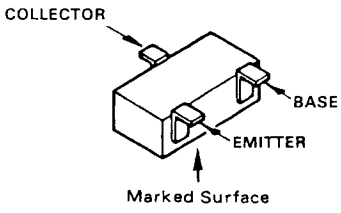
RESISTOR VALUES ARE IN Ω. 1/10W:
CAPACITOR VALUES ARE IN μF. 50wv:
UNLESS OTHERWISE NOTED.
(T)CAPACITORS ARE TANTALUM.

Mixed-Component Side (DC VOLTS)								
1 CLOCK	2 DATA	3 STB	4 UL	5 SAVE 5V	6 VCV	7 GND	8 VCO IN	REMARKS
0	0	0	0/1.3	4.8	1.0~4.0	0	1.9	RX/TX

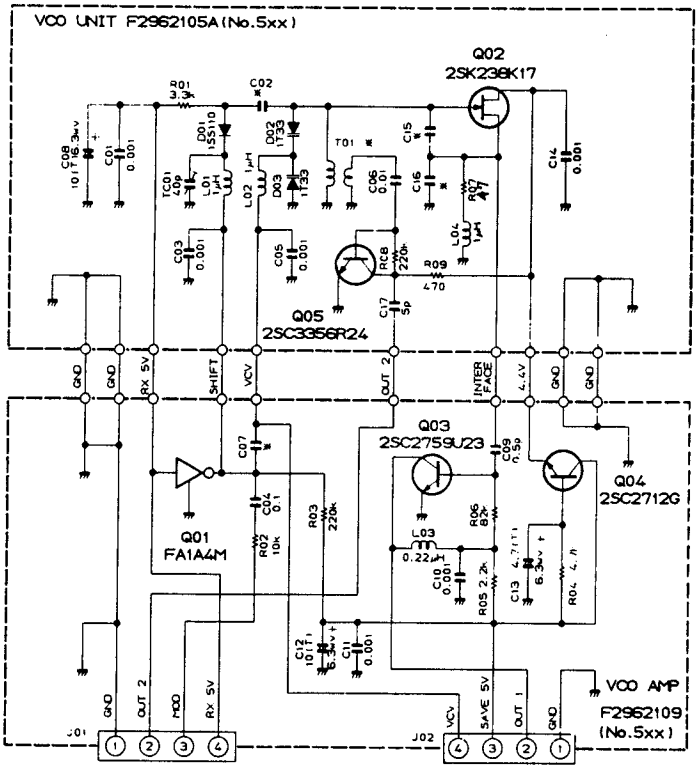
VCO·VCO AMP UNIT



2SK238(K17)(Q501)



2SC2712GR(LG)(Q504)
2SC2759(U23)(Q503)
2SC3356(R24)(Q505)
FA1A4M(L33)(Q501)



* BAND

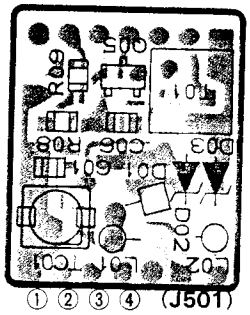
	A	B	C
C02	33p	22p	22p
C07	220p	220p	470p
C15	6p UJ	10p UJ	10p UJ
C16	6p UJ	10p UJ	10p UJ
T01	L0021911	L0021684A	L0021684A

RESISTOR VALUES ARE IN Ω, 1/10W;
CAPACITOR VALUES ARE IN μF, 50WV;
UNLESS OTHERWISE NOTED.
(T)CAPACITORS ARE TANTALUM.

J501 (DC VOLTS)				
1 GND	2 OUT 2	3 MOD	4 RX 5V	REMARKS
0	0.7	0	4.7/0	RX/TX

J502 (DC VOLTS)				
1 GND	2 OUT 1	3 SAVE 5V	4 VCV	REMARKS
0	1.9	4.8	1.0~4.0	

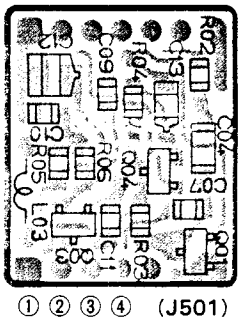
(J502) ④ ③ ② ①



① ② ③ ④ (J501)

〔VCO UNIT〕

(J502) ④ ③ ② ①

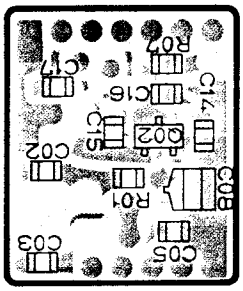


① ② ③ ④ (J501)

〔VCO AMP UNIT〕

(Obverse view of "top" side)

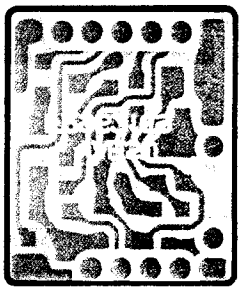
① ② ③ ④ (J502)



(J501) ④ ③ ② ①

〔VCO UNIT〕

① ② ③ ④ (J502)

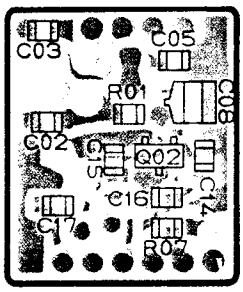


(J501) ④ ③ ② ①

〔VCO AMP UNIT〕

(Obverse view of "bottom" side)

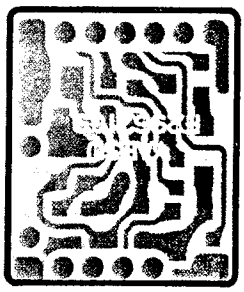
(J502) ④ ③ ② ①



① ② ③ ④ (J501)

〔VCO UNIT〕

(J502) ④ ③ ② ①

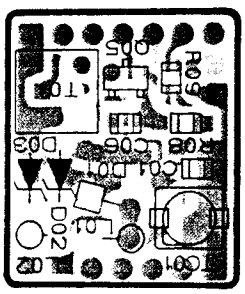


① ② ③ ④ (J501)

〔VCO AMP UNIT〕

(Reverse view of "bottom" side)

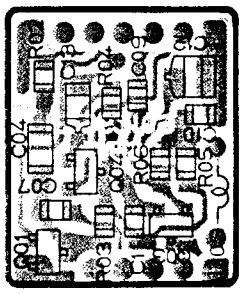
① ② ③ ④ (J502)



(J501) ④ ③ ② ①

〔VCO UNIT〕

① ② ③ ④ (J502)

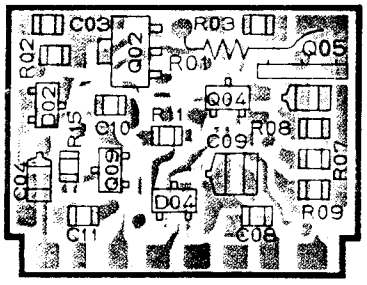


(J501) ④ ③ ② ①

〔VCO AMP UNIT〕

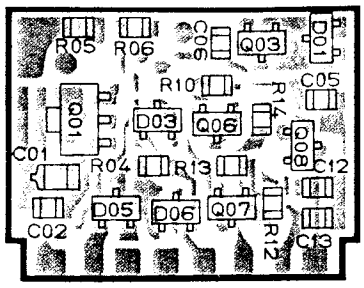
(Reverse view of "top" side)

REG UNIT



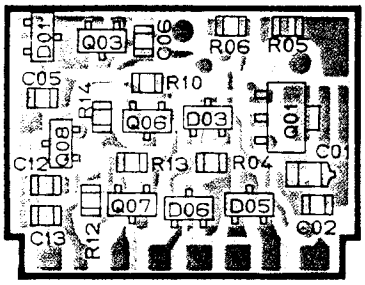
① ② ③ ④ ⑤ ⑥

(Obverse view of "mixed-component" side)



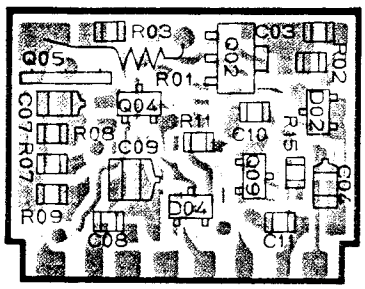
⑧ ⑦ ⑥ ⑤ ④ ③ ② ①

(Obverse view of "chip-only" side)



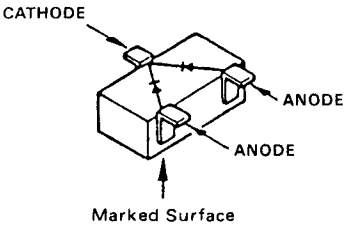
① ② ③ ④ ⑤ ⑥ ⑦ ⑧

(Reverse view of "chip-only side)

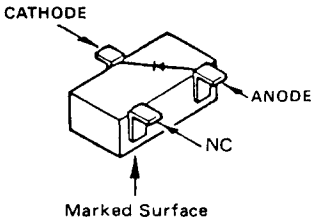


⑥ ⑤ ④ ③ ② ①

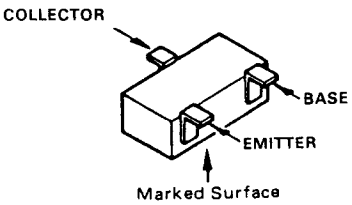
(Reverse view of "mixed-component" side)



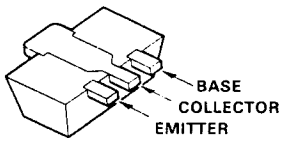
1SS184(B3)(D601,603,604,605,606)



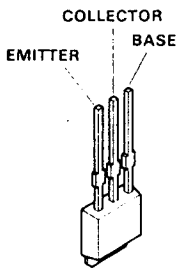
O2CZ8,2X(I5)(D602)



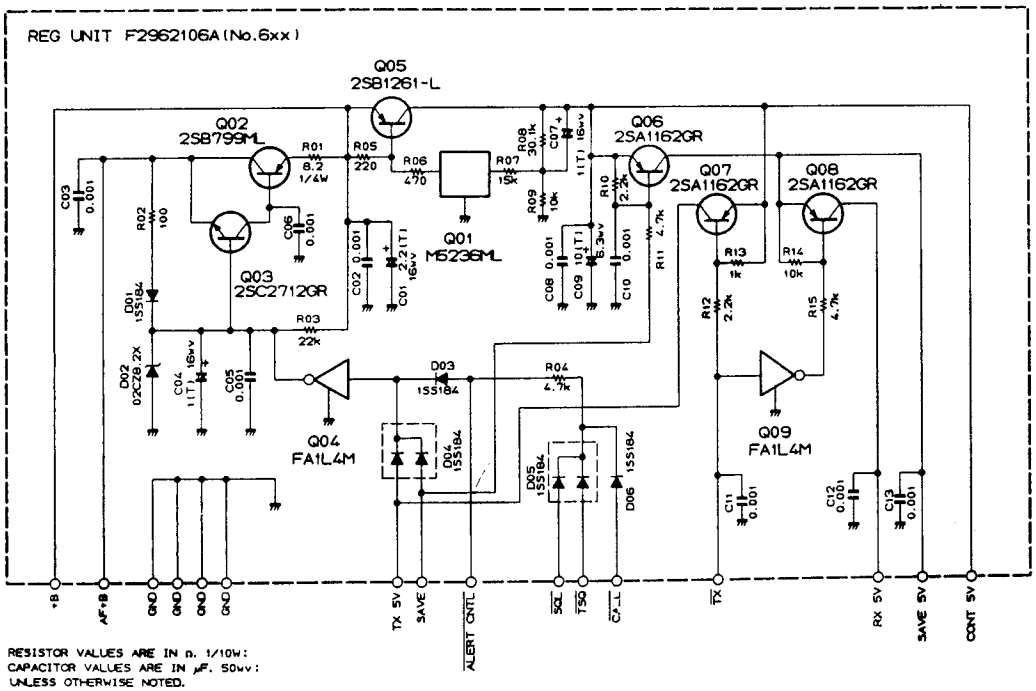
2SA1162GR(SG)
(Q606,607,608)
2SC2712GR(LG)
(Q603)
FA1L4M(L31)
(Q604,609)



2SB799(ML)(Q602)
M5236(ML)(Q601)



2SB1261(Q605)

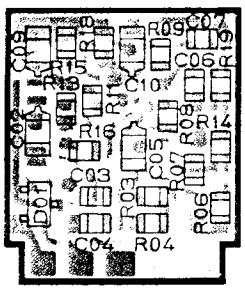


RESISTOR VALUES ARE IN Ω, 1/10W:
CAPACITOR VALUES ARE IN μF, 50WV:
UNLESS OTHERWISE NOTED.
(T)CAPACITORS ARE TANTALUM.

Mixed-Component Side (DC VOLTS)						
1 GND	2 $\overline{TX}$	3 SAVE	4 CONT 5V	5 GND	6 AF+B	REMARKS
0	4.3/0	0	5.0	0	7.6/0	RX/TX

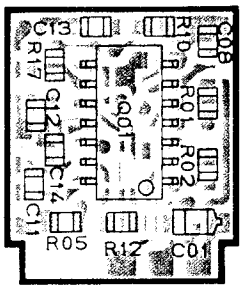
Chip-Only Side (DC VOLTS)								
1 RX 5V	2 SAVE 5V	3 TX 5V	4 $\overline{CALL}$	5 ALERT CNTL	6 SQ SW	7 $\overline{TSQ}$	8 +B	REMARKS
4.7/0	4.8	0/4.8	0	0	0	0	12.0	RX/TX

IDC UNIT



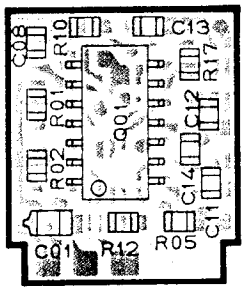
① ② ③

(Obverse view of "diode" side)



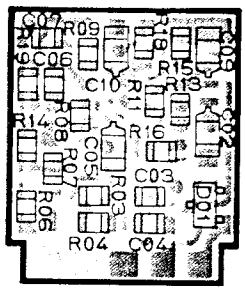
⑤ ④ ③ ② ①

(Obverse view of "IC" side)



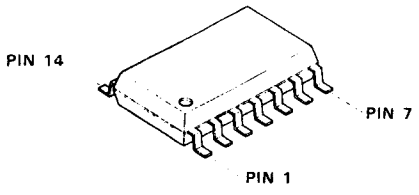
① ② ③ ④ ⑤

(Reverse view of "IC" side)

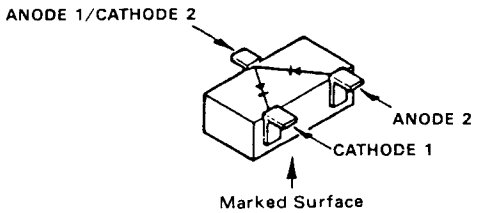


③ ② ①

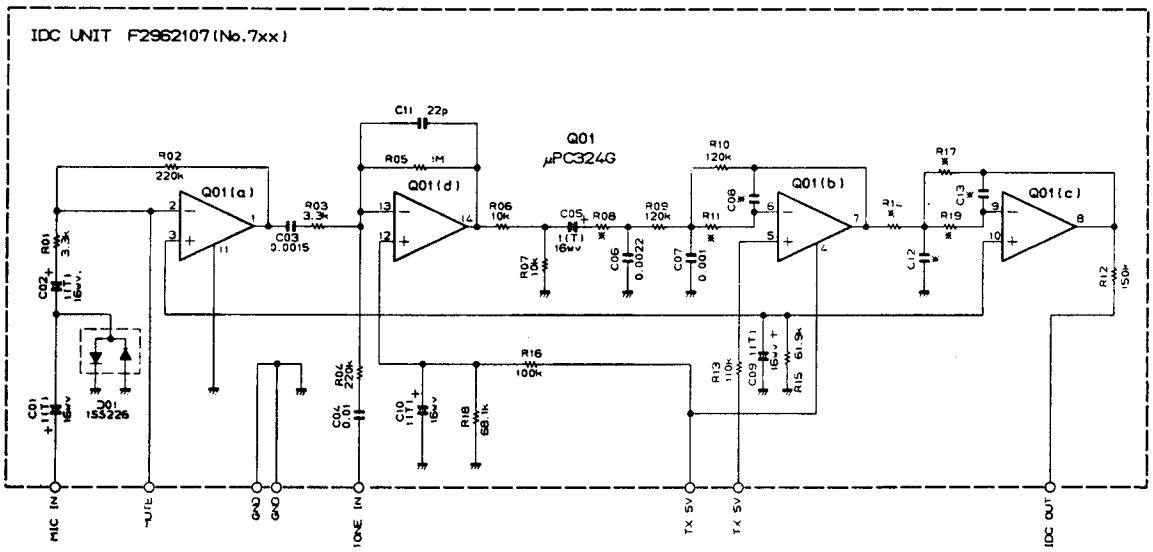
(Reverse view of "diode" side)



μPC324G(Q701)



1SS226(C3)(D701)



RESISTOR VALUES ARE IN Ω, 1/10W;
CAPACITOR VALUES ARE IN μF, 50wv;
UNLESS OTHERWISE NOTED.
†TICAPACITORS ARE TANTALUM.

* SEPARATION

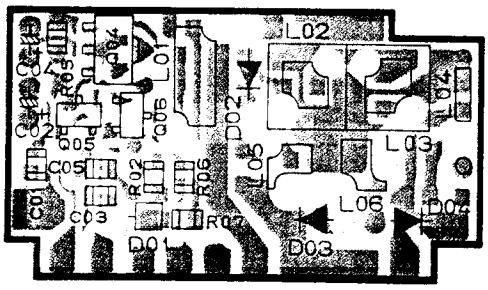
	A/B		C	
	12.5kHz	20/25kHz	12.5kHz	20/25kHz
R08	22k	22k	33k	27k
R11	150k	180k	150k	180k
R14	120k	150k	120k	150k
R17	120k	150k	120k	150k
R19	150k	0	150k	0
C08	150p	100p	150p	100p
C12	0.001	—	0.001	—
C13	150p	—	150p	—

"DIODE" Side (DC VOLTS)			
1/GND	2/TONE IN	3/TX 5V	REMARKS
0	0	0/4.9	RX/TX

"IC" Side (DC VOLTS)					
1/MIC IN	2/MUTE	3/TX 5V	4/MOD OUT	5/GND	REMARKS
5.0/2.8	0/1.8	0/4.9	0/0.3	0	RX/TX

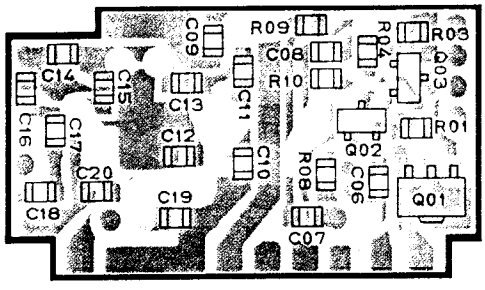
For Service Manuals Contact
MAURITRON TECHNICAL SERVICES
8 Cherry Tree Rd, Chinnor
Oxon OX9 4QY
Tel:- 01844-351694 Fax:- 01844-352554
Email:- enquiries@mauritron.co.uk

ANT SW UNIT



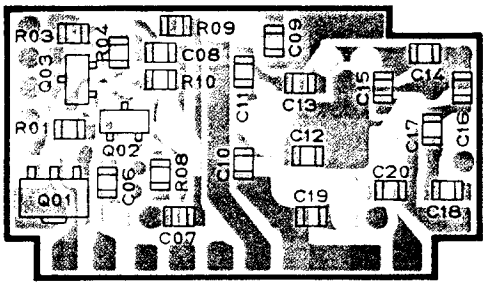
① ② ③ ④

(Obverse view of "mixed-component" side)



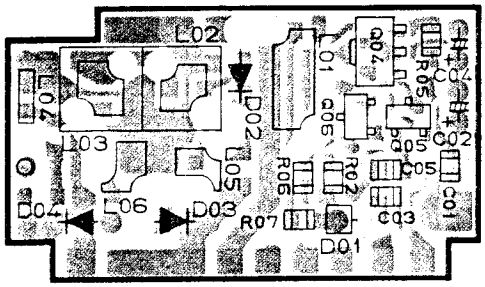
⑦ ⑥ ⑤ ④ ③ ② ①

(Obverse view of "chip-only" side)



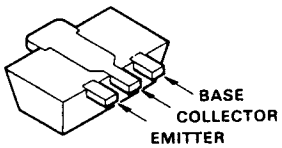
① ② ③ ④ ⑤ ⑥ ⑦

(Reverse view of "chip-only side)

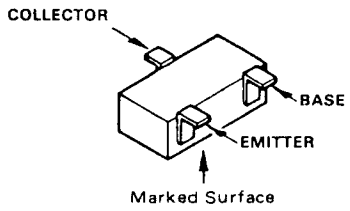


④ ③ ② ①

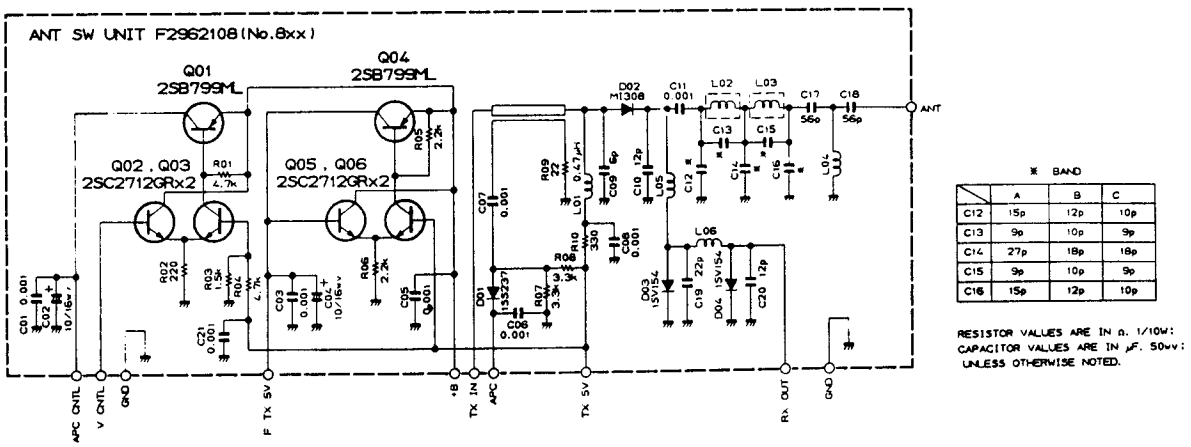
(Reverse view of "mixed-component" side)



2SB799(ML)
(Q801,Q804)



2SC2712GR(LG)
(Q802,803,805,806)



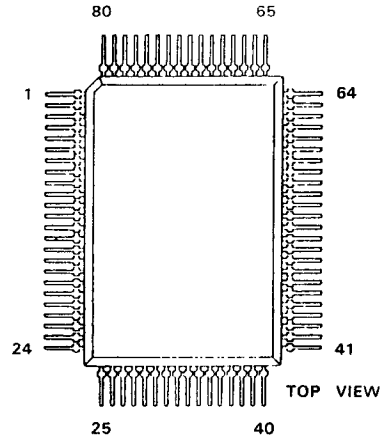
※ BAND

	A	B	C
C12	15p	12p	10p
C13	9p	10p	9p
C14	27p	18p	18p
C15	9p	10p	9p
C16	15p	12p	10p

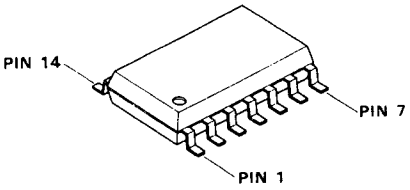
RESISTOR VALUES ARE IN Ω. 1/10W:
CAPACITOR VALUES ARE IN μF. 50WV:
UNLESS OTHERWISE NOTED.

Mixed-Component Side (DC VOLTS)				
1 F. TX 5V	2 V CNTL	3 GND	4 RX OUT	REMARKS
0/5.0	0/1.4	0	0/0.7	RX/TX

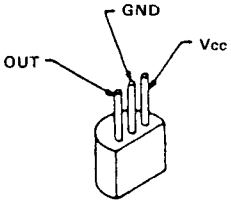
Chip-Only Side (DC VOLTS)							
1 APC CNTL	2 +B	3 APC OUT	4 TX 5V	5 GND	6 TX IN	7 GND	REMARKS
1.5/11.5	12.0	0/2.3	0/4.9	0	0	0	RX/TX



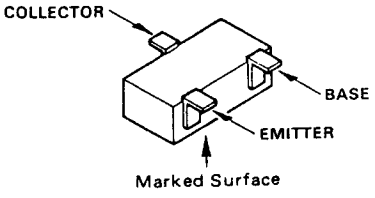
HD613901B29/B35(Q101)



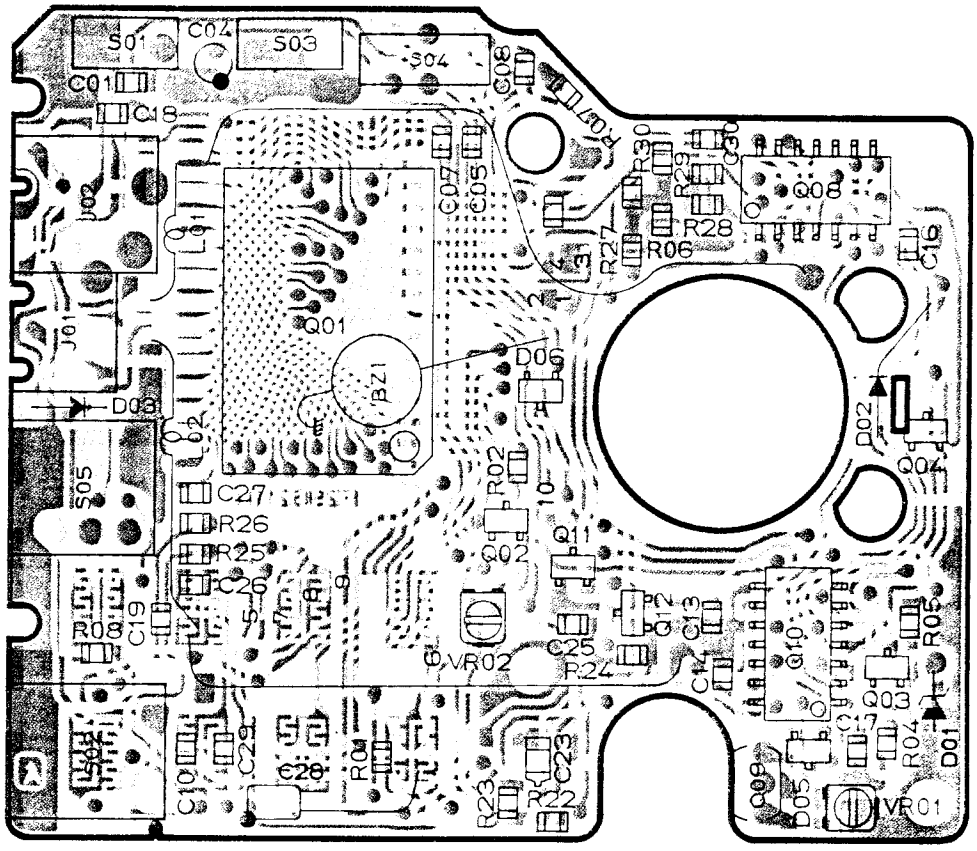
μPD4001BG(Q108)
μPD4066BG(Q110)



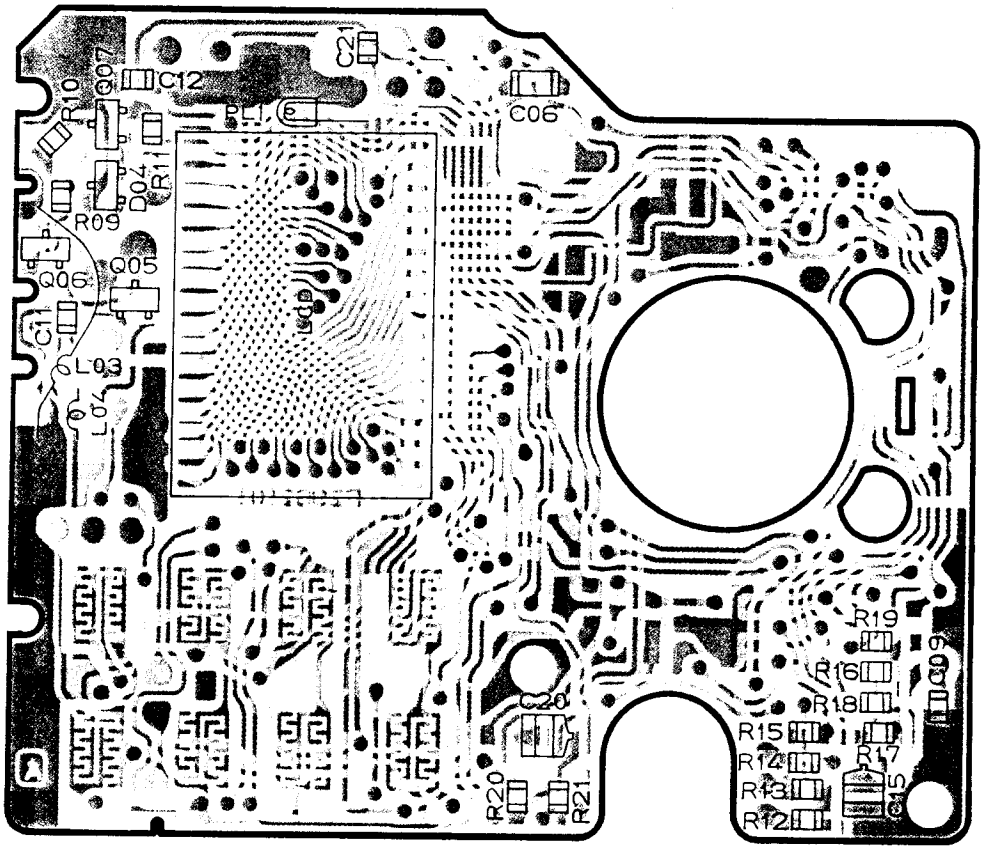
PST523C-2(Q109)



2SA1162GR(SG)(Q104,112)
2SC2712GR(LG)
(Q103,106,107)
FA1A4M(L33)(Q111)
FA1L4M(L31)(Q105)
FN1A4P(M34)(Q102)

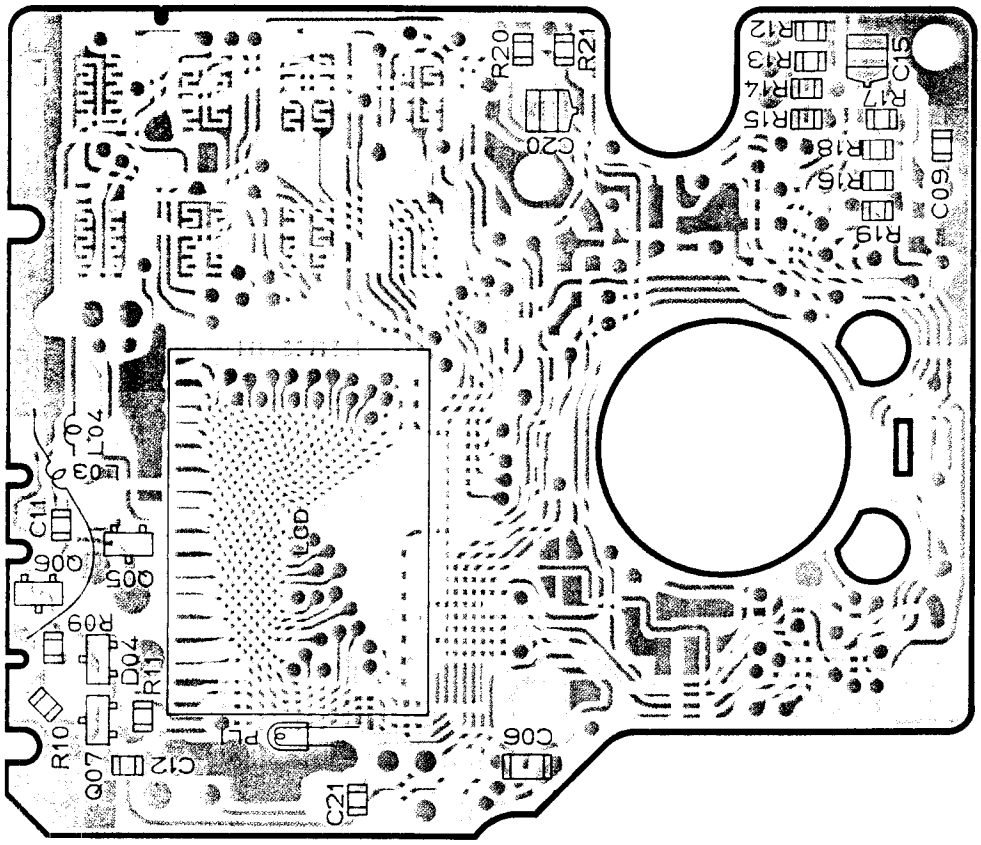


(Obverse view of "IC" side)

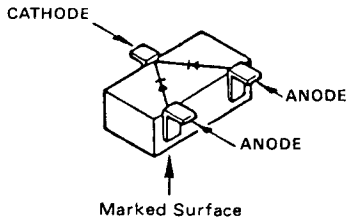


(Reverse view of "LCD" side)

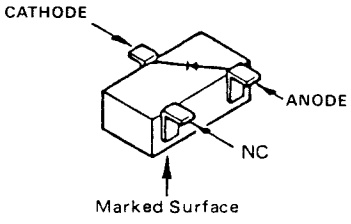
CNTL UNIT



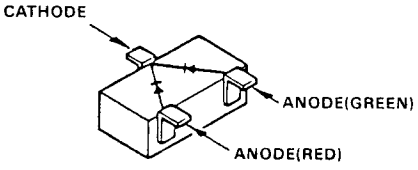
(Obverse view of "LCD" side)



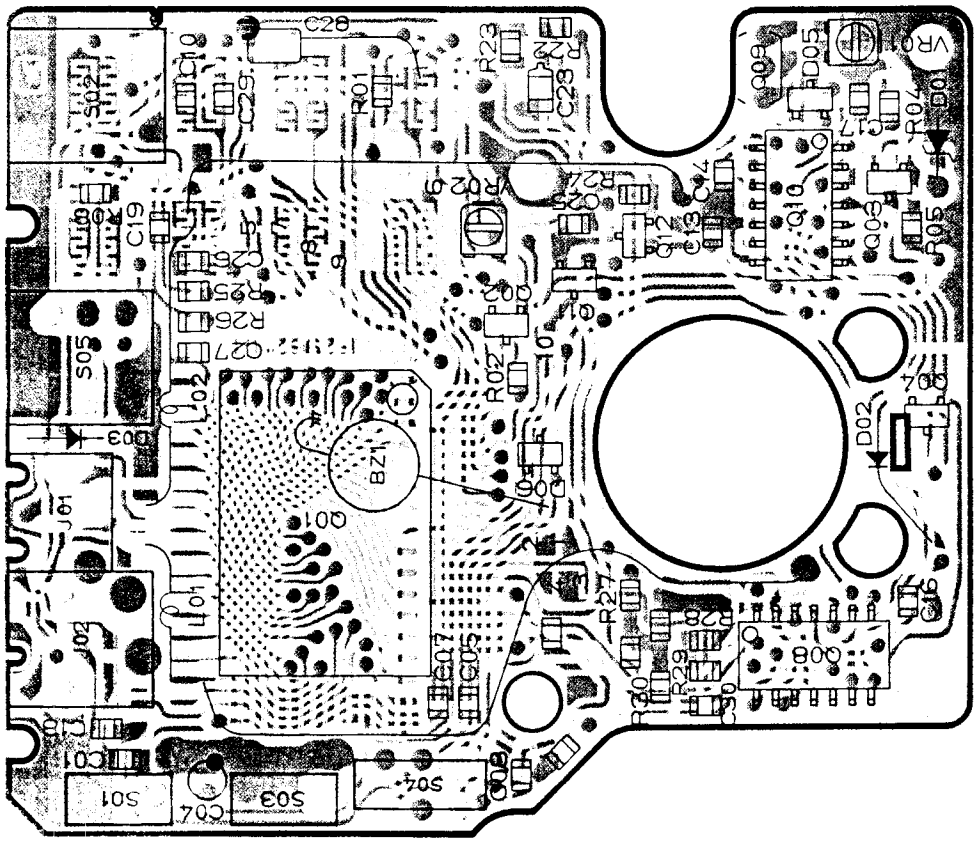
1SS184(B3)(D105)



1SS193(F3)(D106)

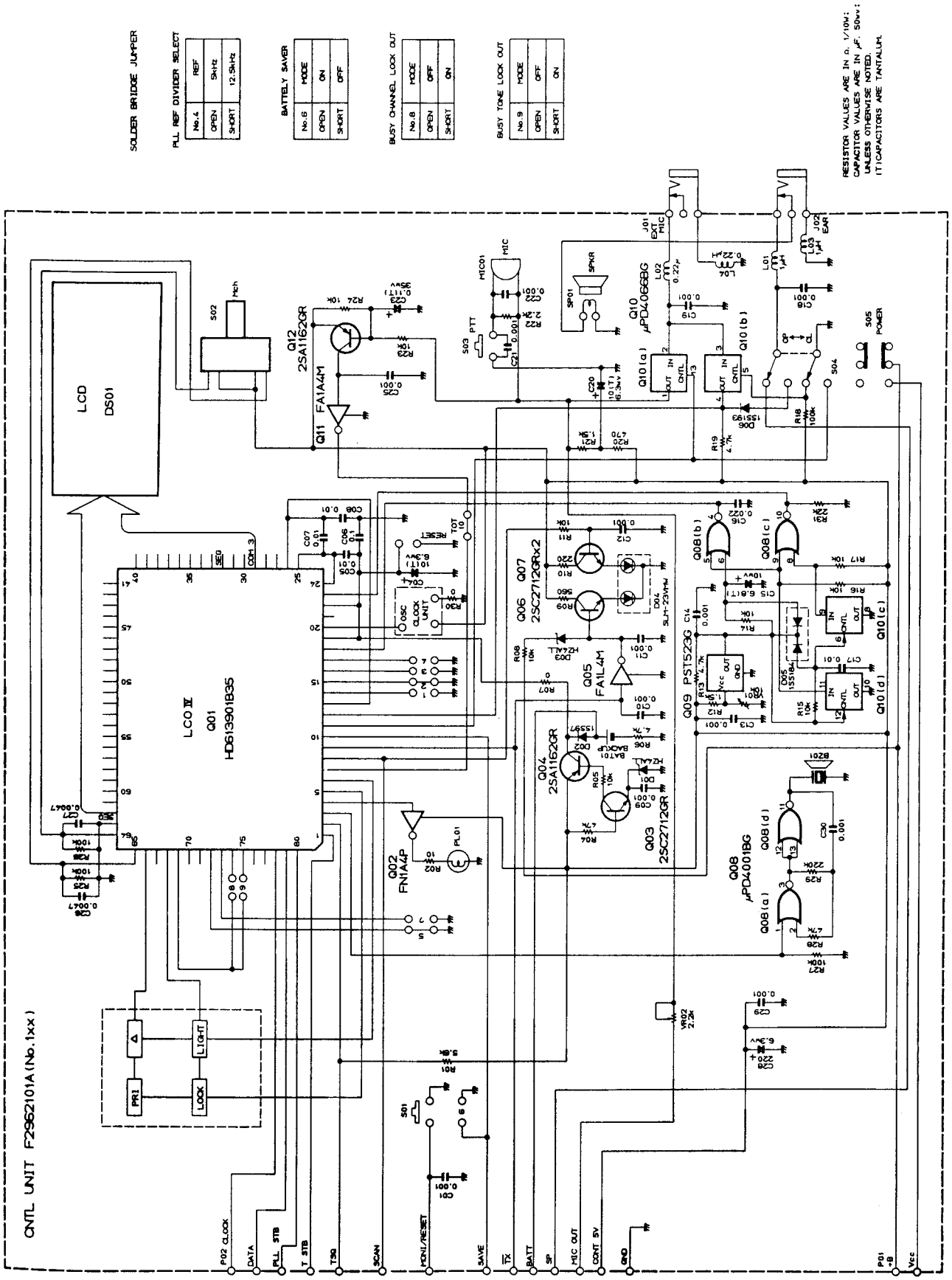


SLM-23VMW(D104)

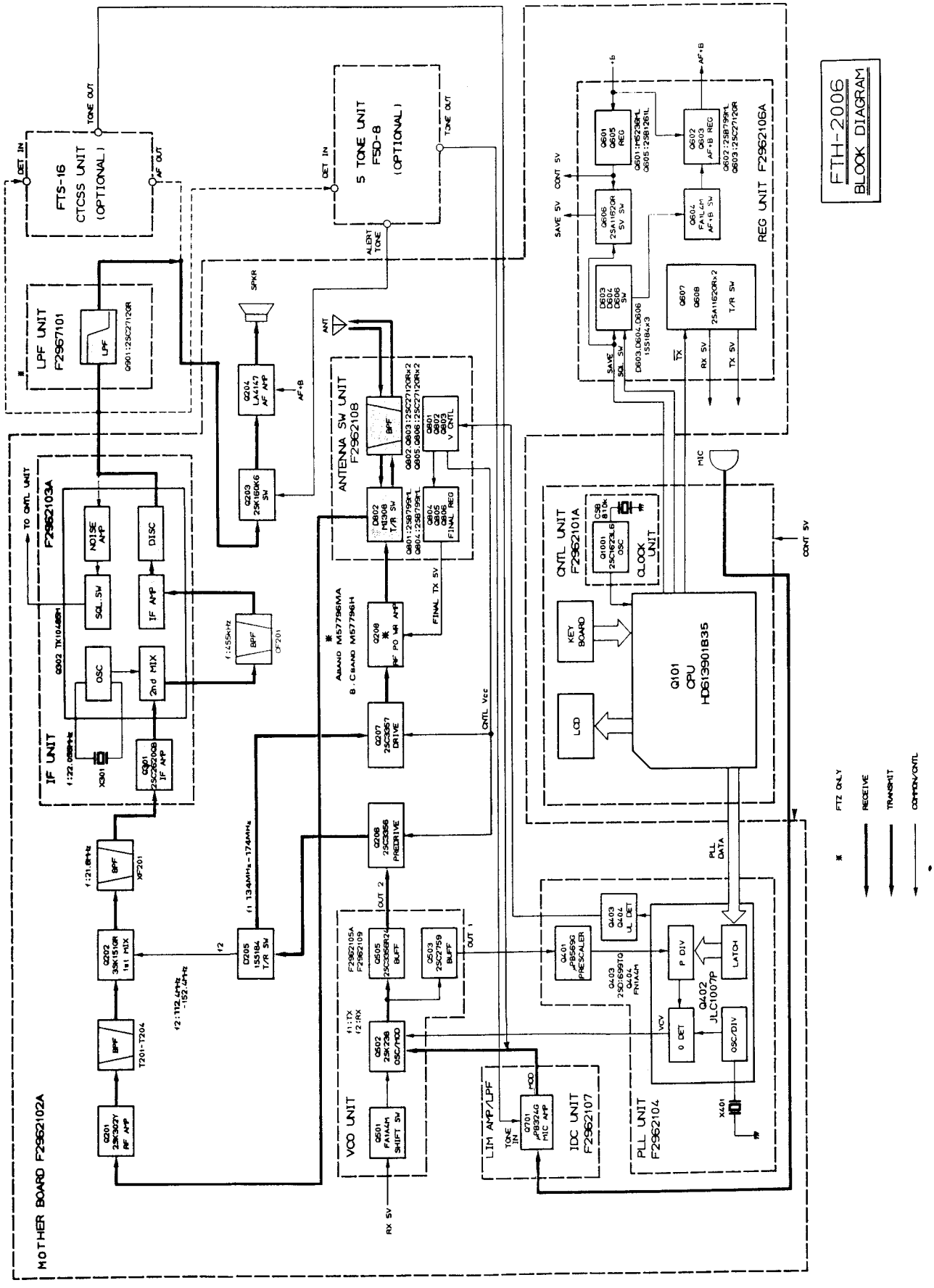


(Reverse view of "IC" side)

For Service Manuals Contact
MAURITRON TECHNICAL SERVICES
8 Cherry Tree Rd, Chinnor
Oxon OX9 4QY
Tel:- 01844-351694 Fax:- 01844-352554
Email:- enquiries@mauritron.co.uk


SOLDER BRIDGE JUMPER
PLL REF DIVIDER SELECT
No.4 | REF
OPEN | 5kHz
SHORT | 12.5kHz
BATTELY SAVER
No.6 | MODE
OPEN | ON
SHORT | OFF
BUSY CHANNEL LOCK OUT
No.8 | MODE
OPEN | OFF
SHORT | ON
BUSY TONE LOCK OUT
No.9 | MODE
OPEN | OFF
SHORT | ON
RESISTOR VALUES ARE IN Ω, 1/10W;
CAPACITOR VALUES ARE IN μF, 50WV;
UNLESS OTHERWISE NOTED.
(T):CAPACITORS ARE TANTALUM.
CNTL UNIT F2962101A(No.1xx)
LCD
DS01
LCD IV
Q01
HD613901B35
Q12
2SA1162GR
Q11 FA1A4M
Q10
μPD4066BG
Q08
μPD4001BG
Q09 PST5236
Q06 Q07
2SC2712GRx2
Q05
FA1L4M
Q04
2SA1162GR
Q03
2SC2712GR
Q02
FN1A4P
MIC
SPKR
PTT
LIGHT
LOCK
PRI
P02 CLOCK
DATA
PLL STB
T STB
T30
SCAN
MONI/RESET
SAVE
TX
BATT
SP
MIC OUT
CONT 5V
GND
P01
+B
Vcc

BLOCK DIAGRAM



CIRCUIT DESCRIPTION

Refer to the block diagram on the facing page when reading this description. For finer details refer to the schematic diagrams.

Receiver

Incoming signals at the antenna are passed through a lowpass filter and t/r switching diode on the Ant Sw Unit before delivery to the front end circuitry on the Mother Board. Here, RF amplifier FET Q201 (2SK302Y) boosts the signal prior to filtering by a 3-stage varactor-tuned resonator, and application to first mixer FET Q202 (3SK151GR) along with the first local signal from Local Amplifier Q206 (2SC3356-R24).

The 21.6 MHz product from the first mixer is delivered through 4-pole monolithic crystal filter XF101 (±7.5 kHz BW) on the Mother Board to first IF amplifier Q301 (2SC2620QB) on the IF Unit.

FM receiver sub-system IC Q302 (TK10485M) on the IF Unit includes local oscillator, mixer, IF limiter amplifier and FM detector circuits. The amplified first IF signal is applied to the mixer section, along with the second local signal internally generated via 22.055 MHz crystal X301. The 455 kHz product is then passed back to ceramic filter CF201 (±6 kHz BW) on the Mother Board, and returned to Q302 for second IF amplification and limiting to remove amplitude variations before application to the discriminator.

The resulting audio output from Q302 is delivered from the IF Unit to the Tone Unit connector. If no tone unit is installed, the audio is de-emphasized by R904 (at the connector) and C220 near audio amplifier Q204 (LA4147) as it is passed through tone gate Q203 (2SK160K16) before passing through VOL potentiometer VR202 to the amplifier and speaker or earphone. If a Tone Squelch Unit is installed, resistance for the de-emphasis network is provided on that unit. If the F5D-8A 5-Tone Unit is installed and armed, Q203 keeps the receiver audio off until the preprogrammed 5-tone code is received and decoded.

When no signal is being received, high frequency noise is present at the output of the discriminator stage of Q302 on the IF Unit. This noise is sampled and band-pass filtered by R311-314, C311 and C312, and then amplified by a noise amplifier in Q302, the output of which is rectified by D301 to provide DC for squelch switching. This squelch control DC (the level of which is adjustable by the operator via Squelch control VR201) is amplified within Q302, providing a squelch gate control signal output at pin 17, which is passed to squelch gate Q604 (FA1L4M) on the Regulator Unit. Q604, along with Q602 (2SB799ML) and Q603 (2SC2712GR), turns off the supply voltage to AF amplifier Q204, disabling it when no signal is received. A sample of the squelch gate control signal also causes ON AIR/BUSY indicator LED D104 (SLM-23VMW, via Q107, 2SC2712GR, on the Control Unit) to glow green when the squelch is open.

Transmitter

When the push-to-talk switch is pressed, audio from the microphone is amplified by one section of microphone audio processing quad opamp IC Q701 (uPC324G) on the IDC Unit. After pre-emphasis by C703 and R703, another section of Q701 serves as an IDC (instantaneous deviation control) amplifier to prevent overdeviation from excessive microphone levels, and the two remaining states provide lowpass filtering to suppress out-of-band modulation, and buffering.

Processed audio from the IDC Unit is delivered to the VCO Unit where it is applied to varactor diodes D502 and D503 (1T33 x 2) to

modulate VCO FET Q502 (2SK238K17), which oscillates at the transmit frequency. A sample of the VCO oscillating frequency is taken at T501 and buffered and amplified by Q206 (2SC3356) and driver Q207 (2SC3357) on the Mother Board before final amplification up to 1 watt by RF power module Q208 (M57796).

The transmit signal is passed through t/r switching diode D802 on the Ant Sw Unit, and then lowpass filtered by L802, L803 and C812-C816) to suppress harmonics before application to the antenna.

Transmitter output is controlled by Q804 (2SB799ML), Q805 and Q806 (2SC2712GR x 2) on the Ant Sw Unit. When the TX 5V line (from the Regulator Unit) is active, bias voltage is applied to the RF power module, turning it on. A sample of the RF output at the stripline is rectified by D801 and amplified by Q802 (2SC2712GR), Q801 (2SB799ML) and Q803 (2SC2712GR). The resulting Automatic Power Control voltage is fed back to Q206 and Q207 to regulate their amplification of the transmitting RF. This circuit is also used by the PLL to disable the transmitter when the PLL is unlocked.

PLL

The first local signal for the receiver (124.4-152.4 MHz), and the carrier for the transmitter (at the transmit frequency) are generated by the PLL. This circuit consists of a voltage-controlled oscillator (VCO), prescaler, programmable divider, reference oscillator, phase detector, charge pump and lowpass filter.
The VCO (on the VCO Unit) consists of Q502 and varactor diodes D502 and D503 (mentioned above). The oscillating frequency is controlled primarily by the level of DC voltage fed from the loop filter (lowpass filter) to the varactor diodes. The VCO output is buffered by Q503 (2SC2759U23), and then delivered to prescaler Q401 (uPB569G) on the PLL Unit, which divides the VCO frequency by 64 or 65 according to a control signal from the prescaler control logic section of PLL subsystem IC Q402 (JLC1007P).

The divided signal from the prescaler is fed to the programmable divider section of Q402, where it is further divided down to 5 kHz according to data from microprocessor Q101 on the Control Unit. Meanwhile, the reference oscillator section of Q402 generates the reference frequency with crystal X401, which signal is divided by Q402.

The reference and the divided VCO signal are applied together to the phase detector section of Q402, from which any phase difference between the two signals results in a pulse train from the phase detector. The pulses are applied to the charge pump section of Q402 and then through a lowpass filter (R410-412 and C413-415), to produce a DC voltage at a level corresponding to the difference in phase between the reference and the divided VCO signal. This DC voltage is returned to the varactor diodes on the VCO Unit, locking the frequency of the VCO to the crystal reference oscillator.

Control Unit & Supply Buses

Microprocessor Q101 (HD613901B35) on the Control Unit contains programming in masked ROM to generate serial data to control the programmable divider in the PLL according to channel frequency data stored in externally programmable static RAM (backed up by lithium battery BAT101 when power is switched off). Q101 also includes programming and driver logic for the Liquid Crystal Display, and for channel frequency scanning. Jumpers are installed during manufacture to select channel steps and frequency range.

The microprocessor receives an indication of the condition of the noise squelch from the FM receiver subsystem IC on the IF Unit, by which scanning is activated or deactivated.

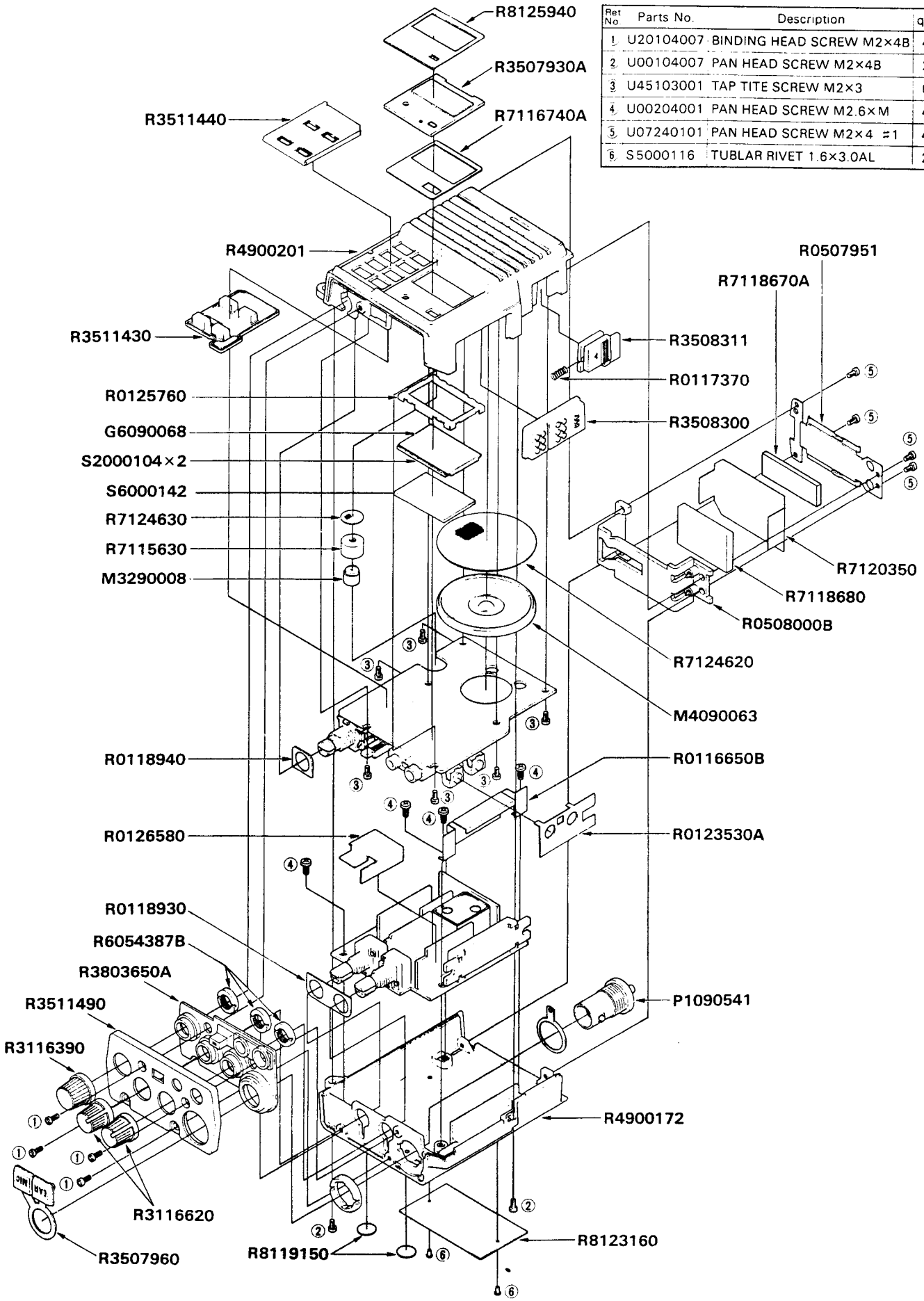
Q101 also controls the power saver function and transmit/receive switching by selecting the supply buses on the Regulator Unit: Q607, Q608 (2SA1162GR x 2) and Q609 (FA1L4M) select the TX or RX 5V bus from voltage regulators Q601 (M5236ML) and Q605 (2SB1261-L), and Q606 (2SA1162GR) disables the RX 5V bus when the power saver is active. Also on the Regulator Unit, the power saver disables the receiver audio amplifier as described previously for the squelch gate.

When the push-to-talk switch is pressed, the impedance change on the microphone line is detected by Q112 (2SA1162GR), and transformed into low impedance switching by Q111 (FA1A4M) for the microprocessor and control of other circuits. The microprocessor activates Q105 (FA1L4M) and Q106 (2SC2712GR) which causes LED indicator D104 to glow red (ON AIR).

Voltage comparator Q109 (PST523G), analog switch Q110 (uPD4066BG) and NAND gate Q108 (uPD4001BG) control power-up resetting of the microprocessor, external/internal microphone and speaker/earphone selection, and provide and oscillator for the beeper.

EXPLODED VIEW

Ref No.	Parts No.	Description	qty
1	U20104007	BINDING HEAD SCREW M2×4B	4
2	U00104007	PAN HEAD SCREW M2×4B	2
3	U45103001	TAP TITE SCREW M2×3	6
4	U00204001	PAN HEAD SCREW M2.6×M	4
5	U07240101	PAN HEAD SCREW M2×4 ≒1	4
6	S5000116	TUBLAR RIVET 1.6×3.0AL	2



ALIGNMENT

The FTH-2006 has been aligned at the factory for the specified performance across the frequency range specified for each version. Realignment should therefore not be necessary except in the event of a component failure, or alteration of version. All component replacement and service should be performed only by an authorized Yaesu representative, or the warranty policy may be voided.

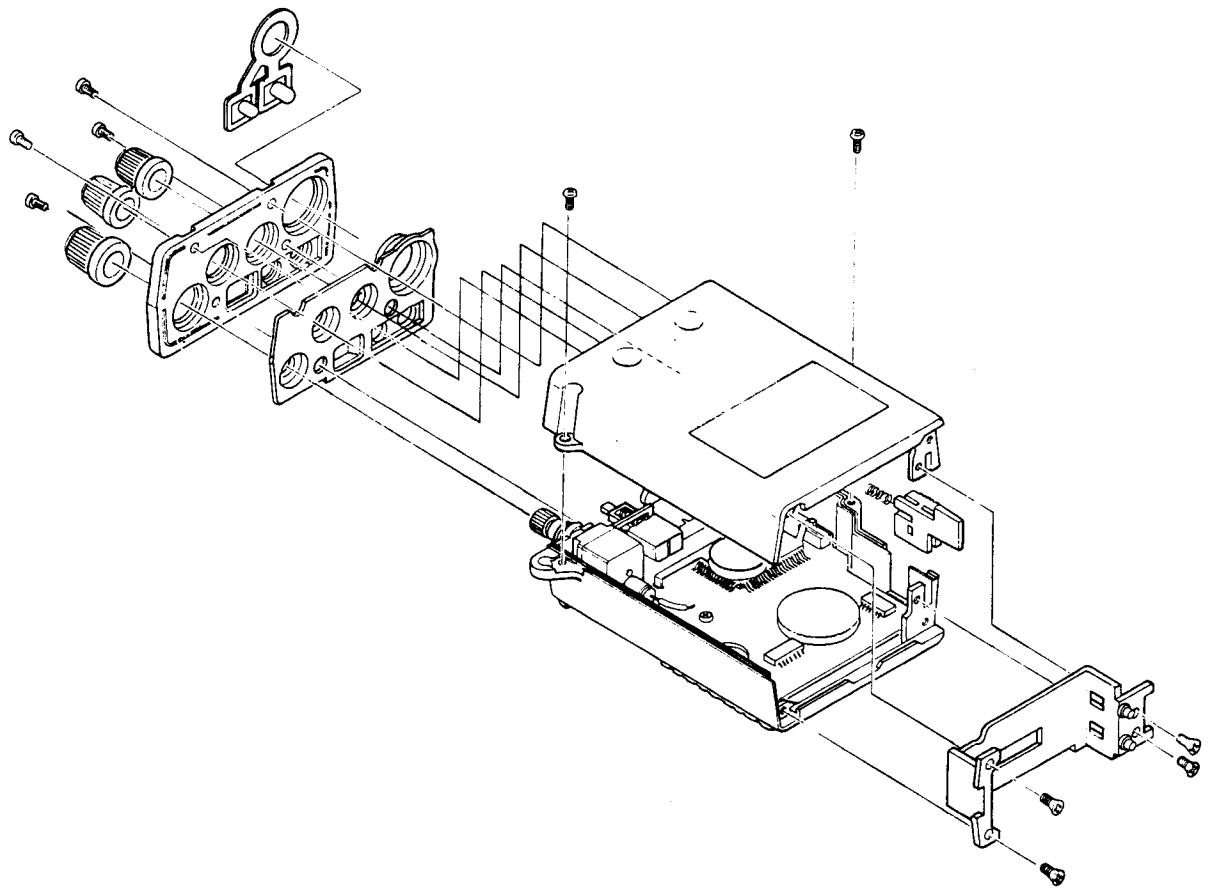
Case Disassembly

(1) Make sure the transceiver is off. Remove the hard or soft protective case, if used, and remove the battery pack.

(2) Remove the four screws affixing the battery spring plate on the bottom of the transceiver, and carefully remove the plate.

(3) Pull of the top panel knobs, and then remove the four screws affixing the top panel, and carefully remove the panel and rubber gasket under it.

(4) Remove the two screws affixing the front and rear halves of the case, and gently separate the halves, using care not to stress the interconnecting wires.



ALIGNMENT

Alignment Equipment

Yaesu FYG-5 PROM Writer
Frequency counter with accuracy of 0.1ppm to 200 MHz
DC voltmeter with at least 10-Megohm input impedance
AF millivoltmeter
DC ammeter ranging to 2A
RF in-line wattmeter with 5% accuracy to 200 MHz
Resistive dummy load, 50 ohms, 10W at 200 MHz
RF signal generator covering up to 200 MHz, with calibrated output levels from 5dBu to 100dBu
AF signal generator with calibrated output levels from 1mV to 25mV
AF amplifier and Loudspeaker
Phon meter
RF sampling coupler "T"
Deviation meter
External loudspeaker (8-ohm, 1W) or 8-ohm load resistor
Regulated DC power supply, 12V @ 2A

Alignment Precautions

Correct alignment requires that the ambient temperature be the same as that of the transceiver and test equipment, and that this temperature be held constant between 20 and 30 °C (68 to 86 °F). When the transceiver is brought into the shop from hot or cold air, it should be allowed some time for thermal equalization before alignment.

Alignments must only be made with oscillator shields and circuit boards firmly affixed in place. Also, the test equipment must be thoroughly warmed up before beginning.

Alignment values assume a DC supply voltage of 12.0V.

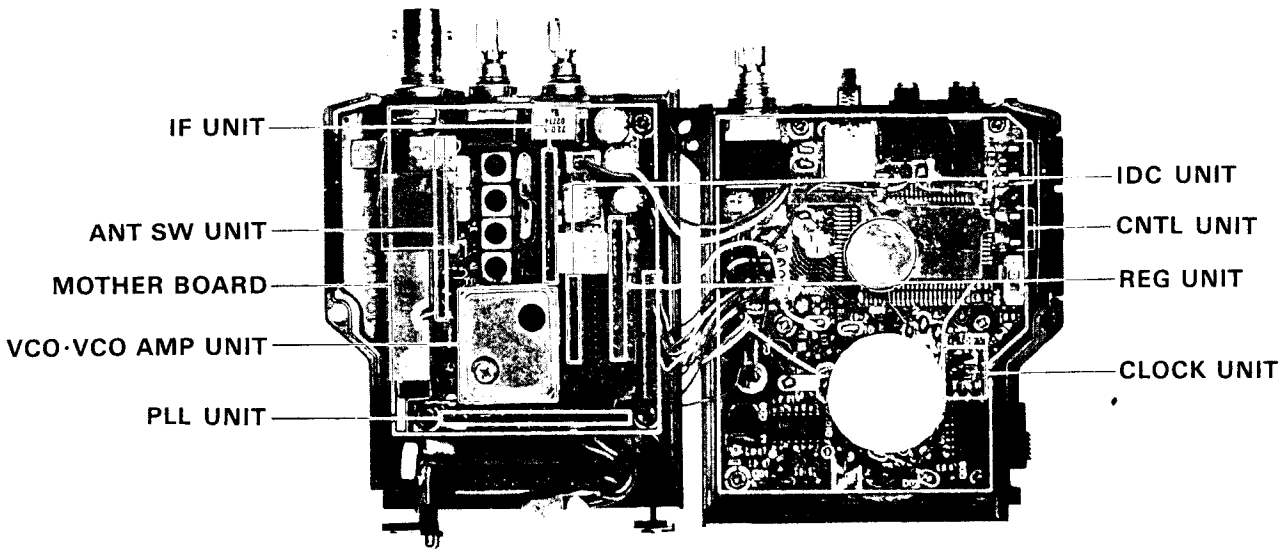
Note: Signal levels in dB referred to in the alignment procedure are based on 0dBu = 0.5uV.

Alignment Channel Frequencies

Before beginning alignment, make note of all channel frequencies used in the transceiver. Then use the FYG-5 to set the transceiver to the frequencies indicated below for the version being aligned.

Alignment Channels (MHz)

Version	Low Edge	Center	High Edge
A	134	140	146
B	146	153	160
C	160	167	174
AS1	140	146.5	153
BS1	153	160	167
BS2	156	163	170



BOARD LAYOUT

I. PLL

A. VCV (Varactor Control Voltage)

1. Connect the DC voltmeter between C414 on the PLL Unit and chassis ground.

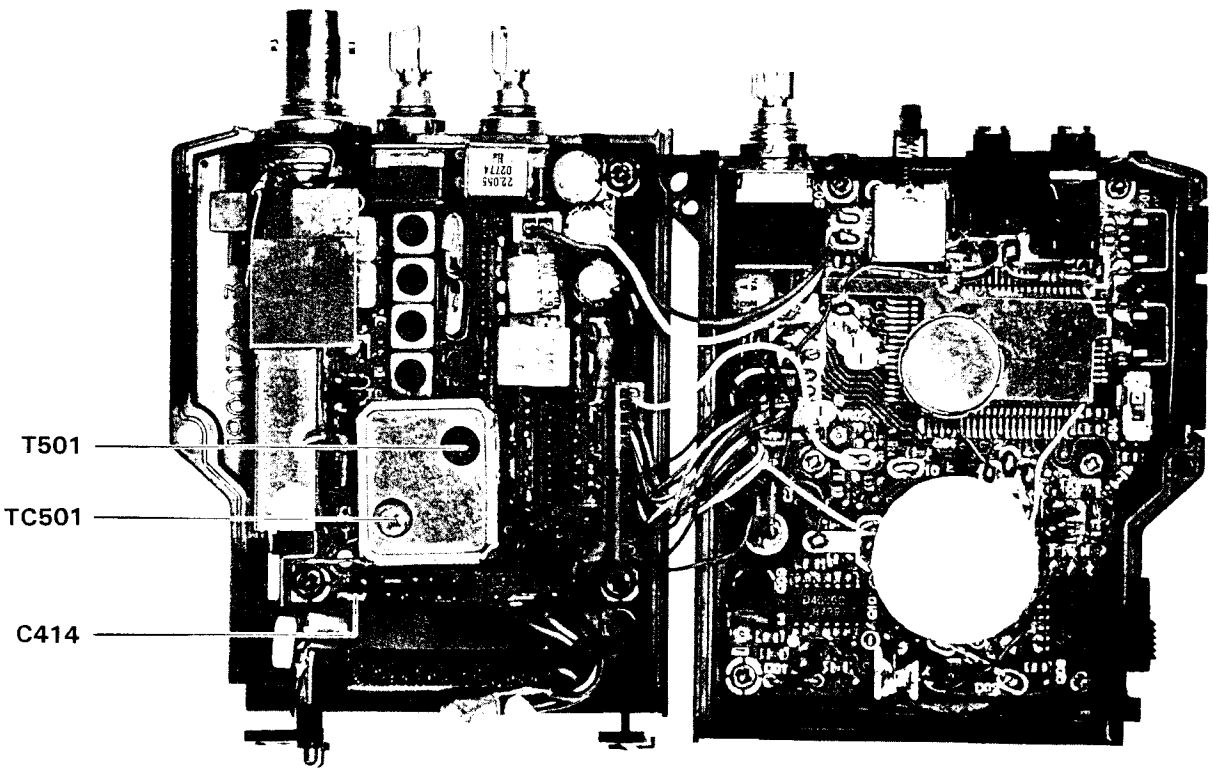
2. Referring to the chart below, set the transceiver first to the Adjustment Frequency, close the PTT switch and adjust transformer T501 on the VCO Unit for the corresponding TX Adjustment Voltage on the voltmeter. Release the PTT switch.

3. Adjust trimmer TC501 on the VCO Unit for the corresponding RX Adjustment Voltage on the meter while receiving.

4. Finally, set the transceiver to the Check Frequency, close the PTT and confirm the corresponding TX Check Voltage; and then do the same for the RX Check Voltage while receiving.

PLL VCV ALIGNMENT CHART

	Adjustment			Check		
Version	Frequency (MHz)	Voltage TX	Voltage RX	Frequency (MHz)	Voltage TX	Voltage RX
A	134	1.0	0.8	146	≤4.0	≤4.0
B	146	1.0	0.8	160	≤4.0	≤4.0
C	160	1.5	0.8	174	≤4.0	≤4.0
AS1	153	2.5	3.6	140	≥1.0	≥0.8
BS1	167	2.5	3.6	167	≥1.0	≥0.8
BS2	170	2.5	3.6	156	≥1.0	≥0.8



PLL SECTION ALIGNMENT POINTS

ALIGNMENT

II. TRANSMITTER

Set up the test equipment as shown at the right.

A. Output Power

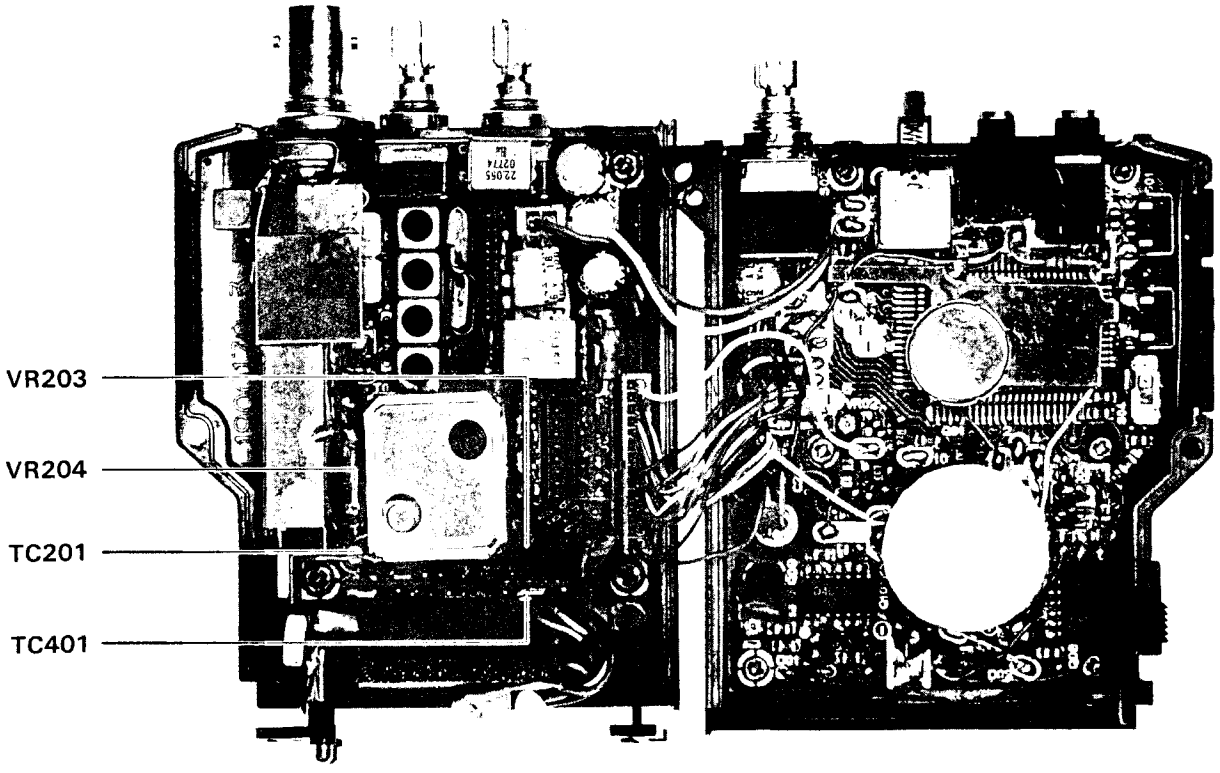
1. Select the center channel and set the LOW power switch to the unde-pressed position.

2. Adjust TC201 on the Mother Board for peak output power on the watt-meter (at least 5W with less than 1.6A supply current).

3. Adjust VR204 on the Mother Board for 5.0W output.

B. Operating Frequency

1. With the center channel selected, adjust TC401 on the PLL Unit, if necessary, so the frequency counter matches that programmed in the center channel.



TRANSMITTER SECTION ALIGNMENT POINTS

C. Modulation Level

If the FTS-16 is installed:

1. While set to the center of the band, set the CTCSS frequency to 151.4 Hz and the encoder ON.

2. Press the PTT switch and with no microphone input, adjust VR01 on the FTS-16 for the deviation corresponding to the minimum channel spacing of the version being aligned:

Min. Channel Spacing	Deviation
25kHz	±0.5 kHz
20kHz	±0.4 kHz
12.5kHz	±0.35 kHz

3. Keeping the encoder ON, perform the following steps (for the FTS-16 being NOT installed).

4. Repeat steps 2 and 3 several times.

If the FTS-16 Tone Squelch Unit is NOT installed:

1. While set to the center of the band, set the AF generator for 25mV injection at 1 kHz.

2. Press the PTT switch and adjust VR203 on the Mother Board for the deviation corresponding to the minimum channel spacing of the version being aligned:

Min. Channel Spacing	Deviation
25kHz	±4.2 kHz
20kHz	±3.4 kHz
12.5kHz	±2.1 kHz

D. Microphone Sensitivity

1. Connect the AF generator, set for 1 kHz, through an amplifier to a loudspeaker placed in front of the microphone on the front panel of the transceiver. Adjust the AF tone level for 95 phon (FTZ) or 94 phon (CCIR) on a phon meter placed 4 cm from the microphone during the following step.

2. Press the PTT switch and adjust VR203 for 80% ±5% of the maximum deviation set in the preceding part (C).

III. RECEIVER

Assemble the test equipment as shown below.

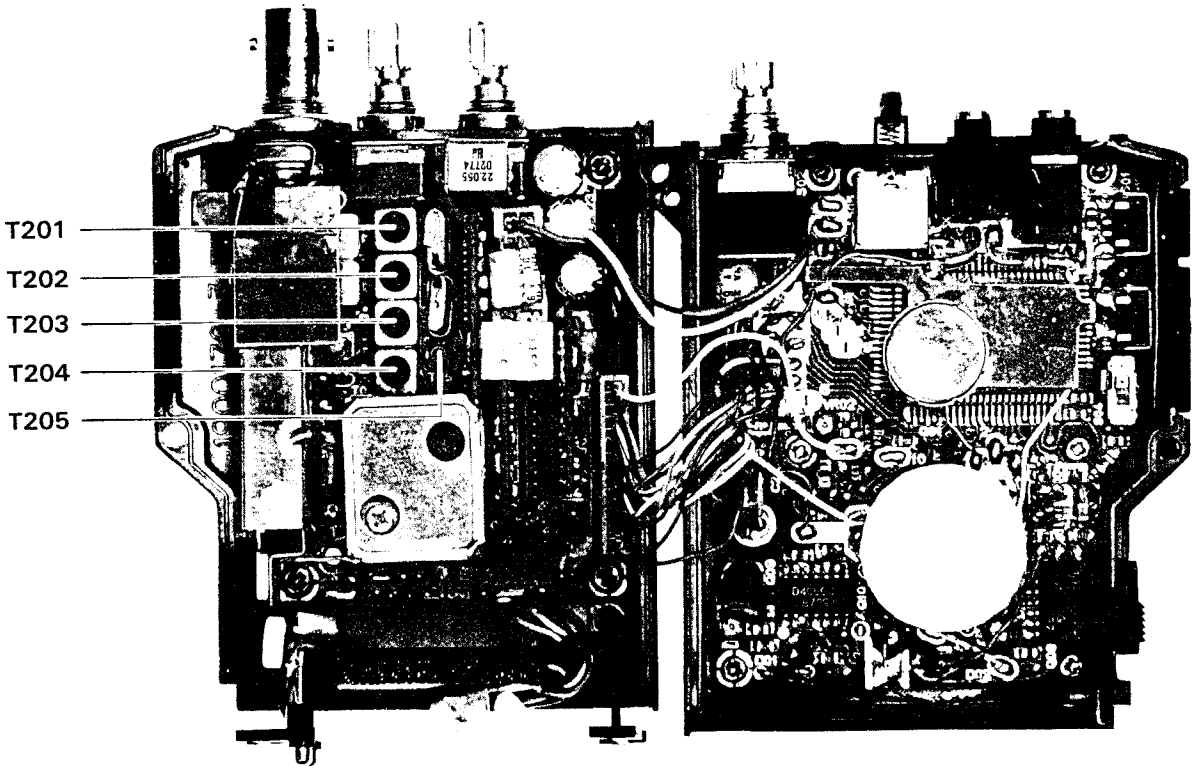
A. Sensitivity

1. Set the transceiver and RF generator to the center channel frequency.

2. Set the RF generator output level to 40dBu with deviation of a 1 kHz modulating tone according to the minimum channel spacing of the version being aligned, as follows:

Ch. Spacing	Deviation
25kHz	±1.5 kHz
20kHz	±2.4 kHz (or ±2.8 kHz for FTZ)
12.5kHz	±3 kHz

3. Adjust T201 - T205 on the Mother Board for minimum deflection on the deviation meter.



RECEIVER SECTION ALIGNMENT POINTS

FTH-2006 PARTS LIST

*** MAIN CHASSIS ***

R1	J00215223	Carbon Film Res.	22k Ohm	1/8W	
C1	K10176102	Ceramic Cap.	0.001uF	50V	B
L1	L0021869	Toroidal Coil			
L2	L0021870	Toroidal Coil			
J1	P1090623	Connector	BNC-RM-1		
	R0123530A	Shield Plate			
	R3511490	Top Panel			
	R4900201	Front Panel			
	R4900172	Rear Panel			
	R7124620	Speaker Cloth			
	R7124630	Microphone Cloth			
	R3508300	Rubber Molding (PTT)			
	R3803650A	Rubber (Top Gasket)			
	R3507960	Rubber (Ear & Mic Plug)			
	R3507930A	Window			
	R0126580	Shield Plate			
	R3116620	Knob (VOL & SQL)			
	R3116390	Knob (CH)			
	R7115630	Microphone Collar			
	R0125760	Bevelled Spacer			
	R0116650B	Bevelled Spacer			
	R3508311	Release Botton			
	R0117370	Coil Spring			
	R0508000B	Insulator Assy			
	R0507951	Battery Mount Spring Plate			
	R7120350	Sheet			
	R0118930	Plate			
	R0118940	Plate			
	R7118670A	Rubber Sponge			
	R3511430	Rubber Keypad	4-Key Type		
	R3511560	Rubber Keypad	8-Key Type		
	R3511440	Keypad Collar	4-Key Type		
	R3511531	Keypad Collar	8-Key Type		

*** CNTL UNIT ***

	F2962101B	Printed Circuit Board	
	C029621AA	PCB with Components (w/o CLOCK Unit)	
	C029621AB	PCB with Components (w/CLOCK Unit)	
Q101	G1090886	IC(Prod.1-6)	HD613901B29
Q101	G1090903	IC(Prod.7-)	HD613901B35
Q102	G3070011	Transistor	FN1A4P-T2B
Q103	G3327127G	Transistor	2SC2712GR TE85R
Q104	G3111627G	Transistor	2SA1162GR TE85R
Q105	G3070013	Transistor	FA1L4-T2B
Q106	G3327127G	Transistor	2SC2712GR TE85R
Q107	G3327127G	Transistor	2SC2712GR TE85R
Q108	G1090601	IC	uPD4001BG

FTH-2006 PARTS LIST

Q109	G1090752	IC	PST523C-2		
Q110	G1090602	IC	uPD4066BG		
Q111	G3070001	Transistor	FA1A4M-T2B		
Q112	G3111627G	Transistor	2SA1162GR TE85R		
D101	G2090334	Diode	HZ4ALL		
D102	G2090118	Diode	1SS97		
D103	G2090334	Diode	HZ4ALL		
D104	G2070096	Diode	SLM-23VMWS T-97B		
D105	G2070009	Diode	1SS184 TE85R		
D106	G2070052	Diode	1SS193 TE85R		
DS101	G6090067	LCD(Prod.1-4)	LR541-A		
DS101	G6090068	LCD(Prod.5-)	FTD-8889		
R101	J24205562	Chip Res.	5.6k Ohm	1/10W	
R102	J24205100	Chip Res.	10 Ohm	1/10W	
R104	J24205472	Chip Res.	4.7k Ohm	1/10W	
R105	J24205103	Chip Res.	10k Ohm	1/10W	
R106	J24205561	Chip Res.	560 Ohm	1/10W	
R107	J24205000	Chip Res.	0 Ohm	1/10W	
R108	J24205103	Chip Res.	10k Ohm	1/10W	
R109	J24205561	Chip Res.	560 Ohm	1/10W	
R110	J24205221	Chip Res.	220 Ohm	1/10W	
R111	J24205103	Chip Res.	10k Ohm	1/10W	
R112	J24205152	Chip Res.	1.5k Ohm	1/10W	
R113	J24205472	Chip Res.	4.7k Ohm	1/10W	
R114	J24205103	Chip Res.	10k Ohm	1/10W	
R115	J24205103	Chip Res.	10k Ohm	1/10W	
R116	J24205103	Chip Res.	10k Ohm	1/10W	
R117	J24205103	Chip Res.	10k Ohm	1/10W	
R118	J24205104	Chip Res.	100k Ohm	1/10W	
R119	J24205472	Chip Res.	4.7k Ohm	1/10W	
R120	J24205471	Chip Res.	470 Ohm	1/10W	
R121	J24205152	Chip Res.	1.5k Ohm	1/10W	
R122	J24205222	Chip Res.	2.2k Ohm	1/10W	
R123	J24205103	Chip Res.	10k Ohm	1/10W	
R124	J24205103	Chip Res.	10k Ohm	1/10W	
R125	J24205104	Chip Res.	100k Ohm	1/10W	
R126	J24205104	Chip Res.	100k Ohm	1/10W	
R127	J24205104	Chip Res.	100k Ohm	1/10W	
R128	J24205473	Chip Res.	47k Ohm	1/10W	
R129	J24205224	Chip Res.	220k Ohm	1/10W	
R130	J24205000	Chip Res.	0 Ohm	1/10W	
R131	J24205223	Chip Res.	22k Ohm	1/10W	
VR101	J51778103	Potentiometer	10k Ohm		
VR102	J51778222	Potentiometer	2.2k Ohm		
C101	K22170805	Chip Cap.	0.001uF	50V	B
C104	K70087106	Tantalum Cap.	10uF	6.3V	
C105	K22170817	Chip Cap.	0.01uF	50V	B
C106	K22141809	Chip Cap.	0.1uF	25V	B
C107	K22170817	Chip Cap.	0.01uF	50V	B
C108	K22170817	Chip Cap.	0.01uF	50V	B
C109	K22170805	Chip Cap.	0.001uF	50V	B

FTH-2006 PARTS LIST

C110	K22170805	Chip Cap.	0.001uF	50V	B
C111	K22170805	Chip Cap.	0.001uF	50V	B
C112	K22170805	Chip Cap.	0.001uF	50V	B
C113	K22170805	Chip Cap.	0.001uF	50V	B
C114	K22170805	Chip Cap.	0.001uF	50V	B
C115	K78100003	Tantalum Chip Cap.	6.8uF	10V	
C116	K22140807	Chip Cap.	0.022uF	25V	B
C117	K22170817	Chip Cap.	0.01uF	50V	B
C118	K22170805	Chip Cap.	0.001uF	50V	B
C119	K22170805	Chip Cap.	0.001uF	50V	B
C120	K78080003	Tantalum Chip Cap.	10uF	6.3V	
C121	K22170805	Chip Cap.	0.001uF	50V	B
C122	K10176102	Ceramic Cap.	0.001uF	50V	B
C123	K78160001	Tantalum Chip Cap.	0.01uF	35V	
C125	K22170805	Chip Cap.	0.001uF	50V	B
C126	K22170813	Chip Cap.	0.0047uF	50V	B
C127	K22170813	Chip Cap.	0.0047uF	50V	B
C128	K40089010	Al Electro Cap.	220uF	6.3V	
C129	K22170805	Chip Cap.	0.001uF	50V	B
C130	K22170805	Chip Cap.	0.001uF	50V	B
L101	L1190283	RFC	1uH		
L102	L1190275	RFC	0.22uH		
L103	L1190283	RFC	1uH		
L104	L1190275	RFC	0.22uH		
BZ101	M4290005	Buzzer	EFB-RE-25D07		
SP101	M4090063	Loudspeaker	0.2W 7.2 Ohm		
MC101	M3290008	Microphone	EM-78CYE		
S101	N5090018	TACT Switch (MONI)	KHH15951		
S102	N0190139	Rotary Switch (M CH)	SRBM1L066		
S103	N5090018	TACT Switch (PTT)	KHH15951		
S104	N6090057	Slide Switch (Write)	SSSS22		
S105	N4090088	Push Switch (Power)	SPJ622NO9		
J101	P1090369	Connector (EXT Mic)	HSJ0838-01-010		
J102	P1090370	Connector (Ear)	HSJ0836-01-010		
P101	T9205675	Wire Assy			
P102	T9205674	Wire Assy			
BT101	Q9000366	Lithium Battery	CR2025-T02		
PL101	Q1000054	Lamp	NO 7656	6V 35mA	
	S6000142	Diffusor			
	S2000104	Rubber Conductor			
	R7118920	Mylar Sheet			
	R0129300	Shield Plate			

FTH-2006 PARTS LIST

*** MOTHER BOARD UNIT ***

F2962102B	Printed Circuit Board	
	PCB with Components w/units A,B,C,D,E,F	
C029622AT	Band A (12.5kHz)	Notes
C029622AU	Band A (20kHz)	(Unit A IF Unit)
C029622AV	Band A (25kHz)	(Unit B PLL Unit)
C029622AG	Band B (12.5kHz)	(Unit C VCO Unit)
C029622AH	Band B (20kHz)	(Unit D IF Unit)
C029622AJ	Band B (25kHz)	(Unit E IDC Unit)
C029622AK	Band C (12.5kHz)	(Unit F ANT SW Unit)
C029622AL	Band C (20kHz)	
C029622AM	Band C (25kHz)	

Q201	G3803027Y	FET	2SK302Y TE85R	
Q202	G4801517G	FET	3SK151GR TE85R	
Q203	G3801607F	FET	2SK160-T2B	
Q204	G1090874	IC	LA4147	
Q205	G3070013	Transistor	FA1L4-T2B	
Q206	G3333567D	Transistor	2SC3356-T2B	
Q207	G3333577	Transistor	2SC3357-T2	
Q208		See Band Table		
Q209	G3070013	Transistor	FA1L4M-T2B	
D201	G2070035	Diode	1T32-T8	
D202	G2070035	Diode	1T32-T8	
D203	G2070035	Diode	1T32-T8	
D204	G2070035	Diode	1T32-T8	
D205	G2070009	Diode	1SS184 TE85R	
D206	G2070052	Diode	1SS193 TE85R	
D207	G2070009	Diode	1SS184 TE85R	
XF201		See Band Table		
CF201		See Band Table		
R201	J24205474	Chip Res.	470k Ohm	1/10W
R202	J24205104	Chip Res.	100k Ohm	1/10W
R203	J24205101	Chip Res.	100 Ohm	1/10W
R204	J24205100	Chip Res.	10 Ohm	1/10W
R205	J24205104	Chip Res.	100k Ohm	1/10W
R206	J24205104	Chip Res.	100k Ohm	1/10W
R207	J24205104	Chip Res.	100k Ohm	1/10W
R208		See Band Table		
R209		See Band Table		
R210	J24205221	Chip Res.	220 Ohm	1/10W
R211	J24205101	Chip Res.	100 Ohm	1/10W
R212		See Band Table		
R213	J24205154	Chip Res.	150k Ohm	1/10W
R214	J24205104	Chip Res.	100k Ohm	1/10W
R215	J24205104	Chip Res.	100k Ohm	1/10W
R216	J24205333	Chip Res.	3.3k Ohm	1/10W
R217		See Band Table		
R218	J24205473	Chip Res.	47k Ohm	1/10W

FTH-2006 PARTS LIST

R219	J24205221	Chip Res.	220 Ohm	1/10W	
R220	J24205331	Chip Res.	330 Ohm	1/10W	
R221	J24205102	Chip Res.	1k Ohm	1/10W	
R222	J24205100	Chip Res.	10 Ohm	1/10W	
R223	J24205100	Chip Res.	10 Ohm	1/10W	
R224	J24205472	Chip Res.	4.7k Ohm	1/10W	
R225	J24205392	Chip Res.	3.9k Ohm	1/10W	
R226	J24205103	Chip Res.	10k Ohm	1/10W	
R227	J24205103	Chip Res.	10k Ohm	1/10W	
R228	J24205821	Chip Res.	820 Ohm	1/10W	
R229	J24205569	Chip Res.	5.6 Ohm	1/10W	
R230	J24205821	Chip Res.	820 Ohm	1/10W	
VR201	J60800132	Potentiometer	20k Ohm VOL	A	
VR202	J60800144	Potentiometer	20k Ohm SQL	B	
VR203	J51778333	Potentiometer	33k Ohm		
VR204	J51778332	Potentiometer	3.3k Ohm		
C201	K22170805	Chip Cap.	0.001uF	50V	B
C202		See Band Table			
C203		See Band Table			
C204	K22170817	Chip Cap.	0.01uF	50V	B
C205		See Band Table			
C206		See Band Table			
C207		See Band Table			
C208		See Band Table			
C209		See Band Table			
C210		See Band Table			
C211		See Band Table			
C212	K22170805	Chip Cap.	0.001uF	50V	B
C213	K22141809	Chip Cap.	0.1uF	25V	B
C214	K22170229	Chip Cap.	56pF	50V	CH
C215		See Band Table			
C216	K22170817	Chip Cap.	0.01uF	50V	B
C217	K22170805	Chip Cap.	0.001uF	50V	B
C218	K78120002	Tantalum Chip Cap.	2.2uF	16V	
C219	K78120002	Tantalum Chip Cap.	2.2uF	16V	
C220		See Band Table			
C221	K22141809	Chip Cap.	0.1uF	25V	B
C222	K22170219	Chip Cap.	22pF	50V	CH
C223	K70127226	Tantalum Chip Cap.	22uF	16V	CH
C224	K40129038	Al. Electro Cap.	100uF	16V	
C225	K22141809	Chip Cap.	0.1uF	25V	B
C226	K40129038	Al. Electro Cap.	100uF	16V	
C227	K40089019	Al. Electro Cap.	330uF	6.3V	
C228	K78120002	Tantalum Chip Cap.	2.2uF	16V	
C229	K22141809	Chip Cap.	0.1uF	25V	B
C230	K22141808	Chip Cap.	0.047uF	25V	B
C231	K22170805	Chip Cap.	0.001uF	50V	B
C232	K22170805	Chip Cap.	0.001uF	50V	B
C233		See Band Table			
C234	K22170805	Chip Cap.	0.001uF	50V	B
C235		See Band Table			
C236	K22170805	Chip Cap.	0.001uF	50V	B
C237	K22170805	Chip Cap.	0.001uF	50V	B
C238	K22170805	Chip Cap.	0.001uF	50V	B

FTH-2006 PARTS LIST

C239	K22170805	Chip Cap.	0.001uF	50V	B
C240	K22170805	Chip Cap.	0.001uF	50V	B
C241	K40129038	Al. Electro Cap.	100uF	16V	
C242	K22141809	Chip Cap.	0.1uF	25V	B
C243	K10176102	Ceramic Cap.	0.001uF	50V	B
C244	K78080003	Tantalum Chip Cap.	10uF	6.3V	
C245	K78160001	Tantalum Chip Cap.	0.1uF	35V	
C246	K22170817	Chip Cap.	0.01uF	50V	B
C247		See Band Table			
C248	K22170805	Chip Cap.	0.001uF	50V	B
C249	K22170805	Chip Cap.	0.001uF	50V	B
C250	K22170821	Chip Cap.	0.022uF	50V	B
C251	K22170805	Chip Cap.	0.001uF	50V	B
C252	K22170817	Chip Cap.	0.01uF	50V	B
C253	K22141809	Chip Cap.	0.1uF	25V	B
C255		See Band Table			
C256	K10176102	Ceramic Cap.	0.001uF	50V	B
C259	K22170817	Chip Cap.	0.01uF	50V	B
C260	K22170805	Chip Cap.	0.001uF	50V	B
C262	K22170219	Chip Cap.	22pF	50V	CH
C263	K10176102	Ceramic Cap.	0.001uF	50V	B
C264		See Band Table			
C265	K22170817	Chip Cap.	0.01uF	50V	B
C267		See Band Table			
TC201	K91000169	Trimmer CAP.	20pF		
L201	L1690003	RFC	0.22uH		
L202	L1690009	RFC	68nH		
L203		See Band Table			
L204		See Band Table			
L205		See Band Table			
T201	L0021887	Coil	145MHz		
T202	L0021697	Coil	150MHz		
T203	L0021697	Coil	150MHz		
T204	L0021697	Coil	150MHz		
T205	L0021867	Coil	21.6MHz		
J201	P0090609	Connector	SB20-02WS		
J202	P0090601	Connector	IL-Y-14PS15T2-EF		
J203	P0090653	Connector	IL-Y-11PS15T2-EF		
J204	P0090598	Connector	IL-Y-4PS15T2-EF		
P201	T9205673	Wire Assy			
	R0128190	Spring Plate			

*** IF UNIT ***

F2962103A Printed Circuit Board

FTH-2006 PARTS LIST

	C029623AA	PCB with Components	(12.5kHz)		
	C029623AB	PCB with Components	(20kHz)		
	C029623AC	PCB with Components	(25kHz)		
Q301	G3326207B	Transistor	2SC2620QBTR		
Q302	G1090808	IC	TK10485M		
D301	G2070003	Diode	1SS226 TE85R		
X301	H0102774	Crystal	UM-1	22.055MHz	
CD301	H7900180	Ceramic Disc	CDB455C7		
R301	J24205000	Chip Res.	0 Ohm	1/10W	
R302		See Band Table			
R303	J24205224	Chip Res.	220k Ohm	1/10W	
R304	J24205473	Chip Res.	47k Ohm	1/10W	
R305	J24205471	Chip Res.	470 Ohm	1/10W	
R306	J24205271	Chip Res.	270 Ohm	1/10W	
R307	J24205470	Chip Res.	47 Ohm	1/10W	
R308	J24205102	Chip Res.	1k Ohm	1/10W	
R309	J24205222	Chip Res.	2.2k Ohm	1/10W	
R310	J24205102	Chip Res.	1k Ohm	1/10W	
R311		See Band Table			
R312		See Band Table			
R313		See Band Table			
R314	J24205682	Chip Res.	6.8k Ohm	1/10W	
R315	J24205472	Chip Res.	4.7k Ohm	1/10W	
C301	K22170817	Chip Cap.	0.01uF	50V	B
C302	K22170817	Chip Cap.	0.01uF	50V	B
C303	K22170229	Chip Cap.	56pF	50V	CH
C305	K22170237	Chip Cap.	120pF	50V	CH
C306	K22141809	Chip Cap.	0.1uF	25V	B
C307	K22141809	Chip Cap.	0.1uF	25V	B
C308	K22170233	Chip Cap.	82pF	50V	CH
C309	K78080004	Tantalum Chip Cap.	15uF	6.3V	
C310	K22170817	Chip Cap.	0.01uF	50V	B
C311	K22170805	Chip Cap.	0.001uF	50V	B
C312	K22170805	Chip Cap.	0.001uF	50V	B
C313	K22170805	Chip Cap.	0.001uF	50V	B
C314	K22141809	Chip Cap.	0.1uF	25V	B
C315	K78120013	Tantalum Chip Cap.	1uF	16V	
C316	K78120013	Tantalum Chip Cap.	1uF	16V	

*** PLL UNIT ***

F2962104A	Printed Circuit Board	
C029624AA	PCB with Components	(12.5kHz)
C029624AB	PCB with Components	(20kHz)
C029624AC	PCB with Components	(25kHz)

FTH-2006 PARTS LIST

Q401	G1090870	IC	uPB569G		
Q402	G1090582	IC	JI.C1007TP		
Q403	G3416997Q	Transistor	2SD1699-T2B		
Q404	G3070012	Transistor	FN1L4M-T2B		
D401	G2070001	Diode	1SS181 TE85R		
D402		See Band Table			
X401		See Band Table			
R401	J24205000	Chip Res.	0 Ohm	1/10W	
R402	J24205223	Chip Res.	22k Ohm	1/10W	
R403	J24205220	Chip Res.	22 Ohm	1/10W	
R404	J24205103	Chip Res.	10k Ohm	1/10W	
R405	J24205103	Chip Res.	10k Ohm	1/10W	
R406	J24205103	Chip Res.	10k Ohm	1/10W	
R407	J24205102	Chip Res.	1k Ohm	1/10W	
R408		See Band Table			
R409		See Band Table			
R410	J24205472	Chip Res.	4.7k Ohm	1/10W	
R411		See Band Table			
R412		See Band Table			
R413	J24205333	Chip Res.	33k Ohm	1/10W	
R414	J24205472	Chip Res.	4.7k Ohm	1/10W	
C401	K22170206	Chip Cap.	5pF	50V	CH
C402	K22170805	Chip Cap.	0.001uF	50V	B
C403	K22170805	Chip Cap.	0.001uF	50V	B
C404	K22170805	Chip Cap.	0.001uF	50V	B
C405	K22170805	Chip Cap.	0.001uF	50V	B
C406	K22170235	Chip Cap.	100pF	50V	CH
C407	K22170235	Chip Cap.	100pF	50V	CH
C408	K22170235	Chip Cap.	100pF	50V	CH
C409	K22170227	Chip Cap.	47pF	50V	CH
C410	K22170221	Chip Cap.	27pF	50V	CH
C411	K78080002	Tantalum Chip Cap.	4.7uF	6.3V	
C412	K22170817	Chip Cap.	0.01uF	50V	B
C413	K22170817	Chip Cap.	0.01uF	50V	B
C414	K22141809	Chip Cap.	0.1uiF	25V	B
C415	K78080010	Tantalum Chip Cap.	6.8uF	6.3V	
C416	K78120013	Tantalum Chip Cap.	1uF	16V	
C417	K78080002	Tantalum Chip Cap.	4.7uF	6.3V	
TC401	K91000166	Trimmer Cap.	30pF		
L401	L1190275	RFC	0.22uH		
L402	L1190307	RFC	100uH		

*** VCO/VCO AMP UNIT ***

F2962105A	Printed Circuit Board	(VCO)
F2962109	Printed Circuit Board	(VCO-AMP)
C029625AG	PCB with Components	Band A VCO w/VCO Amp

FTH-2006 PARTS LIST

	C029625AH	PCB with Components	Band B VCO w/VCO Amp		
	C029625AJ	PCB with Components	Band C VCO w/VCO Amp		
Q501	G3070001	Transistor	FA1A4M-T2B		
Q502	G3802387S	FET	2SK238-K17T2		
Q503	G3327597C	Transistor	2SC2759-T2B U23		
Q504	G3327127G	Transistor	2SC2712GR TE85R		
Q505	G3333567G	Transistor	2SC3356-T2B R24		
D501	G2090297	Diode	1SS110		
D502	G2090271	Diode	1T33		
D503	G2090271	Diode	1T33		
R501	J24205332	Chip Res.	3.3k Ohm	1/10W	
R502	J24205103	Chip Res.	10k Ohm	1/10W	
R503	J24205224	Chip Res.	220k Ohm	1/10W	
R504	J24205472	Chip Res.	4.7k Ohm	1/10W	
R505	J24205222	Chip Res.	2.2k Ohm	1/10W	
R506	J24205823	Chip Res.	82k Ohm	1/10W	
R507	J24205470	Chip Res.	47 Ohm	1/10W	
R508	J24205224	Chip Res.	220k Ohm	1/10W	
R509	J24205471	Chip Res.	4.7k Ohm	1/10W	
C501	K22170805	Chip Cap.	0.001uF	50V	B
C502		See Band Table			
C503	K22170805	Chip Cap.	0.001uF	50V	B
C504	K22170809	Chip Cap.	0.001uF	50V	B
C505	K22170805	Chip Cap.	0.001uF	50V	B
C506	K22170817	Chip Cap.	0.01uF	50V	B
C507		See Band Table			
C508	K78080003	Tantalum Chip Cap.	4.7uF	6.3V	
C509	K22170201	Chip Cap.	0.5pF	50V	B
C510	K22170805	Chip Cap.	0.001uF	50V	B
C511	K22170805	Chip Cap.	0.001uF	50V	B
C512	K78080003	Tantalum Chip Cap.	10uF	6.3V	
C513	K78080002	Tantalum Chip Cap.	4.7uF	6.3V	
C514	K22170805	Chip Cap.	0.001uF	50V	B
C515		See Band Table			
C516		See Band Table			
C517	K22170206	Chip Cap.	5pF	50V	CH
TC501	K91000152	Trimmer Cap.	40pF		
L501	L1190283	RFC	1uH		
L502	L1190283	RFC	1uH		
L503	L1190275	RFC	0.22uH		
L504	L1190283	RFC	1uH		
T501		See Band Table			
J501	P0090668	Connector	IMSA-9210B-1-05-T		
J502	P0090669	Connector	IMSA-9210B-1-07-T		
	R0123010	Shield Case			
	R0123020	Shield Cover			
	R0123030A	Shield Rear			

FTH-2006 PARTS LIST

*** REG UNIT ***

	F2962106A	Printed Circuit Board			
	C029626AA	PCB with Components			
Q601	G1090873	IC	M5236ML-T01-1		
Q602	G3207997L	Transistor	2SB799-T2B		
Q603	G3327127G	Transistor	2SC2712GR TE85R		
Q604	G3070013	Transistor	FA1L4M-T2B		
Q605	G3202610L	Transistor	2SB1261-L		
Q606	G3111627G	Transistor	2SA1162GR TE85R		
Q607	G3111627G	Transistor	2SA1162GR TE85R		
Q608	G3111627G	Transistor	2SA1162GR TE85R		
Q609	G3070013	Transistor	FA1L4M-T2B		
D601	G2070009	Diode	1SS184 TE85R		
D602	G2070050	Diode	02CZ8.2X TE85R		
D603	G2070009	Diode	1SS184 TE85R		
D604	G2070009	Diode	1SS184 TE85R		
D605	G2070009	Diode	1SS184 TE85R		
D606	G2070009	Diode	1SS184 TE85R		
R601	J01245829	Carbon Film Res.	8.2 Ohm	1/4W	
R602	J24205101	Chip Res.	100 Ohm	1/10W	
R603	J24205223	Chip Res.	22k Ohm	1/10W	
R604	J24205472	Chip Res.	4.7k Ohm	1/10W	
R605	J24205221	Chip Res.	220 Ohm	1/10W	
R606	J24205471	Chip Res.	470 Ohm	1/10W	
R607	J24205153	Chip Res.	15k Ohm	1/10W	
R608	J24209006	Chip Res.(1%)	30.1k Ohm	1/10W	
R609	J24209005	Chip Res.(1%)	10k Ohm	1/10W	
R610	J24205222	Chip Res.	2.2k Ohm	1/10W	
R611	J24205472	Chip Res.	4.7k Ohm	1/10W	
R612	J24205222	Chip Res.	2.2k Ohm	1/10W	
R613	J24205102	Chip Res.	1k Ohm	1/10W	
R614	J24205103	Chip Res.	10k Ohm	1/10W	
R615	J24205472	Chip Res.	4.7k Ohm	1/10W	
C601	K78120002	Tantalum Chip Cap.	2.2uF	16V	
C602	K22170805	Chip Cap.	0.001uF	50V	B
C603	K22170805	Chip Cap.	0.001uF	50V	B
C604	K78120013	Tantalum Chip Cap.	1uF	16V	
C605	K22170805	Chip Cap.	0.001uF	50V	B
C606	K22170805	Chip Cap.	0.001uF	50V	B
C607	K78120013	Tantalum Chip Cap.	1uF	16V	
C608	K22170805	Chip Cap.	0.001uF	50V	B
C609	K78080003	Tantalum Chip Cap.	10uF	6.3V	
C610	K22170805	Chip Cap.	0.001uF	50V	B
C611	K22170805	Chip Cap.	0.001uF	50V	B
C612	K22170805	Chip Cap.	0.001uF	50V	B
C613	K22170805	Chip Cap.	0.001uF	50V	B

FTH-2006 PARTS LIST

*** IDC UNIT ***

F2962107 Printed Circuit Board

C029627AE	PCB with Components	Band A (12.5kHz)
C029627AF	PCB with Components	Band A (20kHz)
C029627AF	PCB with Components	Band A (25kHz)
C029627AA	PCB with Components	Band B (12.5kHz)
C029627AB	PCB with Components	Band B (20kHz)
C029627AB	PCB with Components	Band B (25kHz)
C029627AC	PCB with Components	Band C (12.5kHz)
C029627AD	PCB with Components	Band C (20kHz)
C029627AD	PCB with Components	Band C (25kHz)

Q701	G1090913	IC	uPC4741G2		
D701	G2070003	Diode	1SS226 TE85R		
R701	J24205222	Chip Res.	2.2k Ohm	1/10W	
R702	J24205394	Chip Res.	390k Ohm	1/10W	
R703	J24205332	Chip Res.	3.3k Ohm	1/10W	
R704	J24205224	Chip Res.	220k Ohm	1/10W	
R705	J24205105	Chip Res.	1M Ohm	1/10W	
R706		See Band Table			
R707		See Band Table			
R708		See Band Table			
R709	J24205124	Chip Res.	120k Ohm	1/10W	
R710	J24205124	Chip Res.	120k Ohm	1/10W	
R711		See Band Table			
R712	J24205473	Chip Res.	47k Ohm	1/10W	
R713	J24209010	Chip Res.(1%)	110k Ohm	1/10W	
R714		See Band Table			
R715	J24209014	Chip Res.(1%)	150k Ohm	1/10W	
R716	J24209010	Chip Res.(1%)	110k Ohm	1/10W	
R717		See Band Table			
R718	J24209013	Chip Res.(1%)	133k Ohm	1/10W	
R719		See Band Table			
C701	K78120013	Tantalum Chip Cap.	1uF	16V	
C702	K78120013	Tantalum Chip Cap.	1uF	16V	
C703	K22170802	Chip Cap.	560pF	50V	B
C704	K22170811	Chip Cap.	0.0033uF	50V	B
C705	K78120013	Tantalum Chip Cap.	1uF	16V	
C706	K22170809	Chip Cap.	0.0022uF	50V	B
C707	K22170805	Chip Cap.	0.001uF	50V	B
C708		See Band Table			
C709	K78120002	Tantalum Chip Cap.	2.2uF	16V	
C710	K78120013	Tantalum Chip Cap.	1uF	16V	
C711	K22170219	Chip Cap.	22pF	50V	CH
C712		See Band Table			
C713		See Band Table			

FTH-2006 PARTS LIST

*** ANT SW UNIT ***

F2962108 Printed Circuit Board

C029628AC	PCB with Components	Band A
C029628AA	PCB with Components	Band B
C029628AB	PCB with Components	Band C

Q801	G3207997L	Transistor	2SB799-T2ML		
Q802	G3327127G	Transistor	2SC2712GR TE85R		
Q803	G3327127G	Transistor	2SC2712GR TE85R		
Q804	G3207997L	Transistor	2SB799-T2ML		
Q805	G3327127G	Transistor	2SC2712GR TE85R		
Q806	G3327127G	Transistor	2SC2712GR TE85R		
D801	G2090424	Diode	1SS237		
D802	G2090337	Diode	MI308		
D803	G2090426	Diode	1SV154		
D804	G2090426	Diode	1SV154		
R801	J24205472	Chip Res.	4.7k Ohm	1/10W	
R802	J24205221	Chip Res.	220 Ohm	1/10W	
R803	J24205152	Chip Res.	1.5k Ohm	1/10W	
R804	J24205472	Chip Res.	4.7k Ohm	1/10W	
R805	J24205222	Chip Res.	2.2k Ohm	1/10W	
R806	J24205222	Chip Res.	2.2k Ohm	1/10W	
R807	J24205332	Chip Res.	3.3k Ohm	1/10W	
R808	J24205332	Chip Res.	3.3k Ohm	1/10W	
R809	J24205220	Chip Res.	22 Ohm	1/10W	
R810	J24205331	Chip Res.	330 Ohm	1/10W	
R811	J24205472	Chip Res.	4.7k Ohm	1/10W	
C802	K40129052	Al. Electro Cap.	10uF	16V	
C803	K22170805	Chip Cap.	0.001uF	50V	B
C804	K40129052	Al. Electro Cap.	10uF	16V	
C805	K22170805	Chip Cap.	0.001uF	50V	B
C806	K22170805	Chip Cap.	0.001uF	50V	B
C807	K22170805	Chip Cap.	0.001uF	50V	B
C808	K22170805	Chip Cap.	0.001uF	50V	B
C809		See Band Table			
C810	K22170213	Chip Cap.	12pF	50V	CH
C811	K22170805	Chip Cap.	0.001uF	50V	B
C812		See Band Table			
C813		See Band Table			
C814		See Band Table			
C815		See Band Table			
C816		See Band Table			
C817		See Band Table			
C818		See Band Table			
C819	K22170219	Chip Cap.	22pF	50V	CH
C820	K22170213	Chip Cap.	12pF	50V	CH
C821	K22170805	Chip Cap.	0.001uF	50V	B
L801	L1190279	RFC	0.47uH		
L802		See Band Table			

FTH-2006 PARTS LIST			
L803		See Band Table	
L804	L0021894	Coil	
L805	L0020340	Coil	
L806	L0020340	Coil	
	L9190054	Coil Case	
	Q5000082	Terminal Post	TP-N
		*** LPF UNIT (FTZ) ***	
	F2967101	Printed Circuit Board	
	C029671AA	PCB with Components	
Q901	G3327127G	Transistor	2SC2712GR TE85R
R901	J24205682	Chip Res.	6.8k Ohm
R902	J24205682	Chip Res.	6.8k Ohm
R903	J24205155	Chip Res.	1.5M Ohm
R904	J24205223	Chip Res.	22k Ohm
R905	J24205103	Chip Res.	10k Ohm
C901	K22141809	Chip Cap.	0.1uF 25V B
C902	K22170815	Chip Cap.	0.0068uF 50V B
C903	K22170809	Chip Cap.	0.0022uF 50V B
C904	K78080002	Tantalum Chip Cap.	4.7uF 6.3V
J901	P0090654	Connector	1L-Y-10P-S15L2-EF
		*** CLOCK UNIT ***	
	F2970101A	Printed Circuit Board	
	C029701AA	PCB with Components	
Q1001	G3316237F	Transistor	2SC1623-T2BL6
CO1001	H7900270	Ceramic Osc.	CSB800K
R1001	J24205105	Chip Res.	1M Ohm 1/10W
R1002	J24205472	Chip Res.	4.7k Ohm 1/10W
R1003	J24205472	Chip Res.	4.7k Ohm 1/10W
C1001	K22170231	Chip Cap.	68pF 50V CH
C1002	K22170231	Chip Cap.	68pF 50V CH
C1003	K28129001	Ceramic Cap.	0.01uF 16V

BAND TABLE I

	BAND A (134-146MHz)			BAND B (146-160MHz)			BAND C (160-174MHz)			BAND AS1 (140-153MHz)			BAND BS1 (153-167MHz)			BAND BS2 (156-170MHz)		
	(12.5kHz)	(20kHz)	(25kHz)	(12.5kHz)	(20kHz)	(25kHz)	(12.5kHz)	(20kHz)	(25kHz)	(12.5kHz)	(20kHz)	(25kHz)	(12.5kHz)	(20kHz)	(25kHz)	(12.5kHz)	(20kHz)	(25kHz)
Q288	G1090732 M57796MA	G1090732 M57796MA	G1090732 M57796MA	G1090768 M57796H	G1090768 M57796H	G1090768 M57796H	G1090768 M57796H	G1090768 M57796H	G1090768 M57796H	G1090768 M57796H	G1090768 M57796H	G1090768 M57796H	G1090768 M57796H	G1090768 M57796H	G1090768 M57796H	G1090768 M57796H	G1090768 M57796H	G1090768 M57796H
XF201	H1102138 21P8SBU-1	H1102132 21P12BU-1	H1102137 21P15BU-1	H1102138 21P8SBU-1	H1102132 21P12BU-1	H1102137 21P15BU-1	H1102138 21P8SBU-1	H1102132 21P12BU-1	H1102137 21P15BU-1	H1102138 21P8SBU-1	H1102132 21P12BU-1	H1102137 21P15BU-1	H1102138 21P8SBU-1	H1102132 21P12BU-1	H1102137 21P15BU-1	H1102138 21P8SBU-1	H1102132 21P12BU-1	H1102137 21P15BU-1
CF201	H3900387 LF-H8S	H3900382 LF-H12S	H3900204 LF-H15S	H3900387 LF-H8S	H3900382 LF-H12S	H3900204 LF-H15S	H3900387 LF-H8S	H3900382 LF-H12S	H3900204 LF-H15S	H3900387 LF-H8S	H3900382 LF-H12S	H3900204 LF-H15S	H3900387 LF-H8S	H3900382 LF-H12S	H3900204 LF-H15S	H3900387 LF-H8S	H3900382 LF-H12S	H3900204 LF-H15S
R208	J24205332 3.3k Ohm	J24205332 3.3k Ohm	J24205332 3.3k Ohm	J24205152 1.5k Ohm	J24205152 1.5k Ohm	J24205152 1.5k Ohm	J24205332 3.3k Ohm	J24205332 3.3k Ohm	J24205332 3.3k Ohm	J24205152 1.5k Ohm	J24205152 1.5k Ohm	J24205152 1.5k Ohm	J24205152 1.5k Ohm	J24205152 1.5k Ohm	J24205152 1.5k Ohm	J24205332 3.3k Ohm	J24205332 3.3k Ohm	J24205332 3.3k Ohm
R209	J24205122 1.2k Ohm	J24205332 3.3k Ohm	J24205332 3.3k Ohm	J24205122 1.2k Ohm	J24205332 3.3k Ohm	J24205332 3.3k Ohm	J24205122 1.2k Ohm	J24205332 3.3k Ohm	J24205332 3.3k Ohm	J24205122 1.2k Ohm	J24205332 3.3k Ohm	J24205332 3.3k Ohm	J24205122 1.2k Ohm	J24205332 3.3k Ohm	J24205332 3.3k Ohm	J24205122 1.2k Ohm	J24205332 3.3k Ohm	J24205332 3.3k Ohm
R212	J24205332 3.3k Ohm	J24205472 4.7k Ohm	J24205472 4.7k Ohm	J24205332 3.3k Ohm	J24205472 4.7k Ohm	J24205472 4.7k Ohm	J24205332 3.3k Ohm	J24205472 4.7k Ohm	J24205472 4.7k Ohm	J24205332 3.3k Ohm	J24205472 4.7k Ohm	J24205472 4.7k Ohm	J24205332 3.3k Ohm	J24205472 4.7k Ohm	J24205472 4.7k Ohm	J24205332 3.3k Ohm	J24205472 4.7k Ohm	J24205472 4.7k Ohm
R217	J24205222 2.2k Ohm	J24205122 1.2k Ohm	J24205122 1.2k Ohm	J24205222 2.2k Ohm	J24205122 1.2k Ohm	J24205122 1.2k Ohm	J24205222 2.2k Ohm	J24205122 1.2k Ohm	J24205122 1.2k Ohm	J24205222 2.2k Ohm	J24205122 1.2k Ohm	J24205122 1.2k Ohm	J24205222 2.2k Ohm	J24205122 1.2k Ohm	J24205122 1.2k Ohm	J24205222 2.2k Ohm	J24205122 1.2k Ohm	J24205122 1.2k Ohm
C202	K22170223 CH 33pF	K22170223 CH 33pF	K22170223 CH 33pF	K22170221 CH 27pF	K22170221 CH 27pF	K22170221 CH 27pF	K22170217 CH 18pF	K22170217 CH 18pF	K22170217 CH 18pF	K22170221 CH 27pF	K22170221 CH 27pF	K22170221 CH 27pF	K22170221 CH 27pF	K22170221 CH 27pF	K22170221 CH 27pF	K22170217 CH 18pF	K22170217 CH 18pF	K22170217 CH 18pF
C203	K22170203 CH 2pF	K22170203 CH 2pF	K22170203 CH 2pF	K22170202 CH 1pF	K22170202 CH 1pF	K22170202 CH 1pF	Not Used	Not Used	Not Used	K22170202 CH 1pF	K22170202 CH 1pF	K22170202 CH 1pF	K22170202 CH 1pF	K22170202 CH 1pF	K22170202 CH 1pF	Not Used	Not Used	Not Used
C205	K22170223 CH 33pF	K22170223 CH 33pF	K22170223 CH 33pF	K22170219 CH 22pF	K22170219 CH 22pF	K22170219 CH 22pF	K22170217 CH 18pF	K22170217 CH 18pF	K22170217 CH 18pF	K22170219 CH 22pF	K22170219 CH 22pF	K22170219 CH 22pF	K22170219 CH 22pF	K22170219 CH 22pF	K22170219 CH 22pF	K22170217 CH 18pF	K22170217 CH 18pF	K22170217 CH 18pF
C206	K22170202 CH 1pF	K22170202 CH 1pF	K22170202 CH 1pF	K22170201 CH 0.5pF	K22170201 CH 0.5pF	K22170201 CH 0.5pF	K22170201 CH 0.5pF	K22170201 CH 0.5pF	K22170201 CH 0.5pF	K22170201 CH 0.5pF	K22170201 CH 0.5pF	K22170201 CH 0.5pF	K22170201 CH 0.5pF	K22170201 CH 0.5pF	K22170201 CH 0.5pF	K22170201 CH 0.5pF	K22170201 CH 0.5pF	K22170201 CH 0.5pF
C207	K22170208 CH 7pF	K22170208 CH 7pF	K22170208 CH 7pF	K22170207 CH 6pF	K22170207 CH 6pF	K22170207 CH 6pF	K22170205 CH 4pF	K22170205 CH 4pF	K22170205 CH 4pF	K22170208 CH 7pF	K22170208 CH 7pF	K22170208 CH 7pF	K22170207 CH 6pF	K22170207 CH 6pF	K22170207 CH 6pF	K22170205 CH 4pF	K22170205 CH 4pF	K22170205 CH 4pF
C208	K22170223 CH 33pF	K22170223 CH 33pF	K22170223 CH 33pF	K22170221 CH 27pF	K22170221 CH 27pF	K22170221 CH 27pF	K22170215 CH 15pF	K22170215 CH 15pF	K22170215 CH 15pF	K22170221 CH 27pF	K22170221 CH 27pF	K22170221 CH 27pF	K22170221 CH 27pF	K22170221 CH 27pF	K22170221 CH 27pF	K22170215 CH 15pF	K22170215 CH 15pF	K22170215 CH 15pF
C209	K22170203 CH 2pF	K22170203 CH 2pF	K22170203 CH 2pF	K22170202 CH 1pF	K22170202 CH 1pF	K22170202 CH 1pF	K22170202 CH 1pF	K22170202 CH 1pF	K22170202 CH 1pF	K22170202 CH 1pF	K22170202 CH 1pF	K22170202 CH 1pF	K22170202 CH 1pF	K22170202 CH 1pF	K22170202 CH 1pF	K22170202 CH 1pF	K22170202 CH 1pF	K22170202 CH 1pF
C210	K22170207 CH 6pF	K22170207 CH 6pF	K22170207 CH 6pF	K22170205 CH 4pF	K22170205 CH 4pF	K22170205 CH 4pF	K22170202 CH 1pF	K22170202 CH 1pF	K22170202 CH 1pF	K22170205 CH 4pF	K22170205 CH 4pF	K22170205 CH 4pF	K22170205 CH 4pF	K22170205 CH 4pF	K22170205 CH 4pF	K22170202 CH 1pF	K22170202 CH 1pF	K22170202 CH 1pF
C211	K22170223 CH 33pF	K22170223 CH 33pF	K22170223 CH 33pF	K22170221 CH 27pF	K22170221 CH 27pF	K22170221 CH 27pF	K22170221 CH 27pF	K22170221 CH 27pF	K22170221 CH 27pF	K22170221 CH 27pF	K22170221 CH 27pF	K22170221 CH 27pF	K22170221 CH 27pF	K22170221 CH 27pF	K22170221 CH 27pF	K22170221 CH 27pF	K22170221 CH 27pF	K22170221 CH 27pF
C215	K22170217 CH 18pF	K22170209 CH 8pF	K22170209 CH 8pF	K22170217 CH 18pF	K22170209 CH 8pF	K22170209 CH 8pF	K22170217 CH 18pF	K22170209 CH 8pF	K22170209 CH 8pF	K22170217 CH 18pF	K22170209 CH 8pF	K22170209 CH 8pF	K22170217 CH 18pF	K22170209 CH 8pF	K22170209 CH 8pF	K22170217 CH 18pF	K22170209 CH 8pF	K22170209 CH 8pF
C220	K78160002 0.15uF	K78160004 0.33uF	K78160004 0.33uF	K78160002 0.15uF	K78160004 0.33uF	K78160004 0.33uF	K78160002 0.15uF	K78160004 0.33uF	K78160004 0.33uF	K78160002 0.15uF	K78160004 0.33uF	K78160004 0.33uF	K78160002 0.15uF	K78160004 0.33uF	K78160004 0.33uF	K78160002 0.15uF	K78160004 0.33uF	K78160004 0.33uF
C233	K22170225 CH 39pF	K22170225 CH 39pF	K22170225 CH 39pF	K22170221 CH 27pF	K22170221 CH 27pF	K22170221 CH 27pF	K22170219 CH 22pF	K22170219 CH 22pF	K22170219 CH 22pF	K22170221 CH 27pF	K22170221 CH 27pF	K22170221 CH 27pF	K22170221 CH 27pF	K22170221 CH 27pF	K22170221 CH 27pF	K22170219 CH 22pF	K22170219 CH 22pF	K22170219 CH 22pF
C235	K22170213 CH 12pF	K22170213 CH 12pF	K22170213 CH 12pF	K22170209 CH 8pF	K22170209 CH 8pF	K22170209 CH 8pF	Not Used	Not Used	Not Used	K22170209 CH 8pF	K22170209 CH 8pF	K22170209 CH 8pF	K22170209 CH 8pF	K22170209 CH 8pF	K22170209 CH 8pF	Not Used	Not Used	Not Used
C247	K22170205 CH 4pF	K22170205 CH 4pF	K22170205 CH 4pF	K22170204 CH 3pF	K22170204 CH 3pF	K22170204 CH 3pF	K22170203 CH 2pF	K22170203 CH 2pF	K22170203 CH 2pF	K22170204 CH 3pF	K22170204 CH 3pF	K22170204 CH 3pF	K22170204 CH 3pF	K22170204 CH 3pF	K22170204 CH 3pF	K22170203 CH 2pF	K22170203 CH 2pF	K22170203 CH 2pF
C255	Not Used	Not Used	Not Used	K22170202 CH 1pF	K22170202 CH 1pF	K22170202 CH 1pF	K22170202 CH 1pF	K22170202 CH 1pF	K22170202 CH 1pF	K22170202 CH 1pF	K22170202 CH 1pF	K22170202 CH 1pF	K22170202 CH 1pF	K22170202 CH 1pF	K22170202 CH 1pF	K22170202 CH 1pF	K22170202 CH 1pF	K22170202 CH 1pF
C264	K02172050 CH 5pF	K02172050 CH 5pF	K02172050 CH 5pF	K02172030 CH 3pF	K02172030 CH 3pF	K02172030 CH 3pF	K02172020 CH 2pF	K02172020 CH 2pF	K02172020 CH 2pF	K02172030 CH 3pF	K02172030 CH 3pF	K02172030 CH 3pF	K02172030 CH 3pF	K02172030 CH 3pF	K02172030 CH 3pF	K02172020 CH 2pF	K02172020 CH 2pF	K02172020 CH 2pF

BAND TABLE II

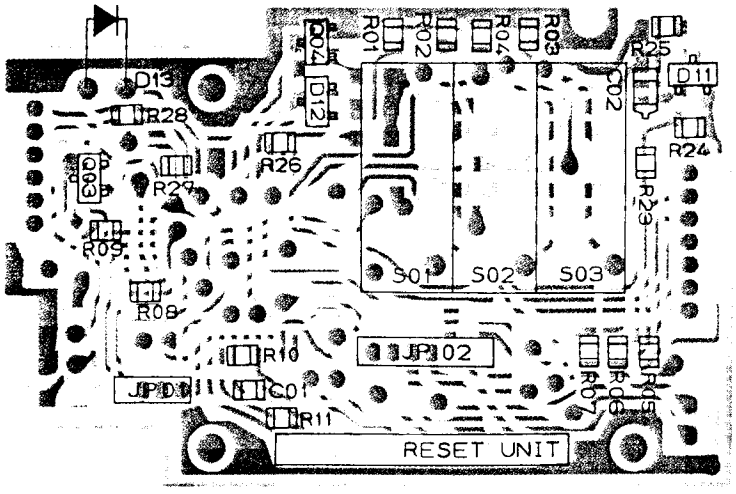
	BAND A (134-146MHz)			BAND B (146-160MHz)			BAND C (160-174MHz)			BAND AS1 (140-153MHz)			BAND BS1 (153-167MHz)			BAND BS2 (156-170MHz)		
	(12.5kHz)	(20kHz)	(25kHz)	(12.5kHz)	(20kHz)	(25kHz)	(12.5kHz)	(20kHz)	(25kHz)	(12.5kHz)	(20kHz)	(25kHz)	(12.5kHz)	(20kHz)	(25kHz)	(12.5kHz)	(20kHz)	(25kHz)
C267	K22170204 CH 3pF	K22170204 CH 3pF	K22170204 CH 3pF	Not Used	Not Used	Not Used	Not Used	Not Used	Not Used	Not Used	Not Used	Not Used	Not Used	Not Used	Not Used	Not Used	Not Used	Not Used
L203	L1020725	L1020725	L1020725	L1020722	L1020722	L1020722	L1020722	L1020722	L1020722	L1020722	L1020722	L1020722	L1020722	L1020722	L1020722	L1020722	L1020722	L1020722
L204	L1690020 0.82uH	L1690020 0.82uH	L1690020 0.82uH	L1690020 0.47uH	L1690020 0.47uH	L1690020 0.47uH	L1690020 0.47uH	L1690020 0.47uH	L1690020 0.47uH	L1690020 0.47uH	L1690020 0.47uH	L1690020 0.47uH	L1690020 0.47uH	L1690020 0.47uH	L1690020 0.47uH	L1690020 0.47uH	L1690020 0.47uH	L1690020 0.47uH
L205	L1690011 0.1uH	L1690011 0.1uH	L1690011 0.1uH	L1690011 0.1uH	L1690011 0.1uH	L1690011 0.1uH	L1690011 0.1uH	L1690011 0.1uH	L1690011 0.1uH	L1690011 0.1uH	L1690011 0.1uH	L1690011 0.1uH	L1690011 0.1uH	L1690011 0.1uH	L1690011 0.1uH	L1690011 0.1uH	L1690011 0.1uH	L1690011 0.1uH
R302	J24205102 1k Ohm	J24205152 1.5k Ohm	J24205152 1.5k Ohm	J24205102 1k Ohm	J24205152 1.5k Ohm	J24205152 1.5k Ohm	J24205102 1k Ohm	J24205152 1.5k Ohm	J24205152 1.5k Ohm	J24205102 1k Ohm	J24205152 1.5k Ohm	J24205152 1.5k Ohm	J24205102 1k Ohm	J24205152 1.5k Ohm	J24205152 1.5k Ohm	J24205102 1k Ohm	J24205152 1.5k Ohm	J24205152 1.5k Ohm
R311	J24205334 330k Ohm	J24205474 470k Ohm	J24205474 470k Ohm	J24205334 330k Ohm	J24205474 470k Ohm	J24205474 470k Ohm	J24205334 330k Ohm	J24205474 470k Ohm	J24205474 470k Ohm	J24205334 330k Ohm	J24205474 470k Ohm	J24205474 470k Ohm	J24205334 330k Ohm	J24205474 470k Ohm	J24205474 470k Ohm	J24205334 330k Ohm	J24205474 470k Ohm	J24205474 470k Ohm
R312	J24205153 15k Ohm	J24205223 22k Ohm	J24205223 22k Ohm	J24205153 15k Ohm	J24205223 22k Ohm	J24205223 22k Ohm	J24205153 15k Ohm	J24205223 22k Ohm	J24205223 22k Ohm	J24205153 15k Ohm	J24205223 22k Ohm	J24205223 22k Ohm	J24205153 15k Ohm	J24205223 22k Ohm	J24205223 22k Ohm	J24205153 15k Ohm	J24205223 22k Ohm	J24205223 22k Ohm
R313	J24205332 3.3k Ohm	J24205122 1.2k Ohm	J24205122 1.2k Ohm	J24205332 3.3k Ohm	J24205122 1.2k Ohm	J24205122 1.2k Ohm	J24205332 3.3k Ohm	J24205122 1.2k Ohm	J24205122 1.2k Ohm	J24205332 3.3k Ohm	J24205122 1.2k Ohm	J24205122 1.2k Ohm	J24205332 3.3k Ohm	J24205122 1.2k Ohm	J24205122 1.2k Ohm	J24205332 3.3k Ohm	J24205122 1.2k Ohm	J24205122 1.2k Ohm
D402	Not Used	G2070003 1SS226TE85R	G2070003 1SS226TE85R	Not Used	G2070003 1SS226TE85R	G2070003 1SS226TE85R	Not Used	G2070003 1SS226TE85R	G2070003 1SS226TE85R	Not Used	G2070003 1SS226TE85R	G2070003 1SS226TE85R	Not Used	G2070003 1SS226TE85R	G2070003 1SS226TE85R	Not Used	G2070003 1SS226TE85R	G2070003 1SS226TE85R
X401	H0102799 12.8MHz	H0102800 10.24MHz	H0102800 10.24MHz	H0102799 12.8MHz	H0102800 10.24MHz	H0102800 10.24MHz	H0102799 12.8MHz	H0102800 10.24MHz	H0102800 10.24MHz	H0102799 12.8MHz	H0102800 10.24MHz	H0102800 10.24MHz	H0102799 12.8MHz	H0102800 10.24MHz	H0102800 10.24MHz	H0102799 12.8MHz	H0102800 10.24MHz	H0102800 10.24MHz
R408	J24205000 0 Ohm	Not Used	Not Used	J24205000 0 Ohm	Not Used	Not Used	J24205000 0 Ohm	Not Used	Not Used	J24205000 0 Ohm	Not Used	Not Used	J24205000 0 Ohm	Not Used	Not Used	J24205000 0 Ohm	Not Used	Not Used
R409	Not Used	J24205000 0 Ohm	J24205000 0 Ohm	Not Used	J24205000 0 Ohm	J24205000 0 Ohm	Not Used	J24205000 0 Ohm	J24205000 0 Ohm	Not Used	J24205000 0 Ohm	J24205000 0 Ohm	Not Used	J24205000 0 Ohm	J24205000 0 Ohm	Not Used	J24205000 0 Ohm	J24205000 0 Ohm
R411	J24205103 10k Ohm	J24205153 15k Ohm	J24205153 15k Ohm	J24205103 10k Ohm	J24205153 15k Ohm	J24205153 15k Ohm	J24205103 10k Ohm	J24205153 15k Ohm	J24205153 15k Ohm	J24205103 10k Ohm	J24205153 15k Ohm	J24205153 15k Ohm	J24205103 10k Ohm	J24205153 15k Ohm	J24205153 15k Ohm	J24205103 10k Ohm	J24205153 15k Ohm	J24205153 15k Ohm
R412	J24205152 1.5k Ohm	J24205222 2.2k Ohm	J24205222 2.2k Ohm	J24205152 1.5k Ohm	J24205222 2.2k Ohm	J24205222 2.2k Ohm	J24205152 1.5k Ohm	J24205222 2.2k Ohm	J24205222 2.2k Ohm	J24205152 1.5k Ohm	J24205222 2.2k Ohm	J24205222 2.2k Ohm	J24205152 1.5k Ohm	J24205222 2.2k Ohm	J24205222 2.2k Ohm	J24205152 1.5k Ohm	J24205222 2.2k Ohm	J24205222 2.2k Ohm
C502	K22170223 CH 33pF	K22170223 CH 33pF	K22170223 CH 33pF	K22170219 CH 22pF	K22170219 CH 22pF	K22170219 CH 22pF	K22170219 CH 22pF	K22170219 CH 22pF	K22170219 CH 22pF	K22170219 CH 22pF	K22170219 CH 22pF	K22170219 CH 22pF	K22170219 CH 22pF	K22170219 CH 22pF	K22170219 CH 22pF	K22170219 CH 22pF	K22170219 CH 22pF	K22170219 CH 22pF
C507	K22170243 CH 220pF	K22170243 CH 220pF	K22170243 CH 220pF	K22170243 CH 220pF	K22170243 CH 220pF	K22170243 CH 220pF	K22170251 CH 470pF	K22170251 CH 470pF	K22170251 CH 470pF	K22170243 CH 220pF	K22170243 CH 220pF	K22170243 CH 220pF	K22170243 CH 220pF	K22170243 CH 220pF	K22170243 CH 220pF	K22170251 CH 470pF	K22170251 CH 470pF	K22170251 CH 470pF
C515	K22170307 UJ 6pF	K22170307 UJ 6pF	K22170307 UJ 6pF	K22170311 UJ 10pF	K22170311 UJ 10pF	K22170311 UJ 10pF	K22170311 UJ 10pF	K22170311 UJ 10pF	K22170311 UJ 10pF	K22170311 UJ 10pF	K22170311 UJ 10pF	K22170311 UJ 10pF	K22170311 UJ 10pF	K22170311 UJ 10pF	K22170311 UJ 10pF	K22170311 UJ 10pF	K22170311 UJ 10pF	K22170311 UJ 10pF
C516	K22170307 UJ 6pF	K22170307 UJ 6pF	K22170307 UJ 6pF	K22170311 UJ 10pF	K22170311 UJ 10pF	K22170311 UJ 10pF	K22170311 UJ 10pF	K22170311 UJ 10pF	K22170311 UJ 10pF	K22170311 UJ 10pF	K22170311 UJ 10pF	K22170311 UJ 10pF	K22170311 UJ 10pF	K22170311 UJ 10pF	K22170311 UJ 10pF	K22170311 UJ 10pF	K22170311 UJ 10pF	K22170311 UJ 10pF
T501	L0021911 140MHz	L0021911 140MHz	L0021911 140MHz	L0021684A 150MHz	L0021684A 150MHz	L0021684A 150MHz	L0021684A 150MHz	L0021684A 150MHz	L0021684A 150MHz	L0021684A 150MHz	L0021684A 150MHz	L0021684A 150MHz	L0021684A 150MHz	L0021684A 150MHz	L0021684A 150MHz	L0021684A 150MHz	L0021684A 150MHz	L0021684A 150MHz

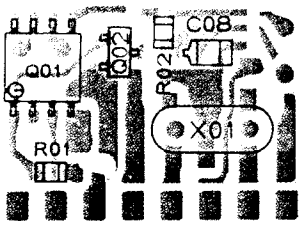
BAND TABLE III

	BAND A (134-146MHz)			BAND B (146-160MHz)			BAND C (160-174MHz)			BAND AS1 (140-153MHz)			BAND BS1 (153-167MHz)			BAND BS2 (156-170MHz)		
	(12.5kHz)	(20kHz)	(25kHz)	(12.5kHz)	(20kHz)	(25kHz)	(12.5kHz)	(20kHz)	(25kHz)	(12.5kHz)	(20kHz)	(25kHz)	(12.5kHz)	(20kHz)	(25kHz)	(12.5kHz)	(20kHz)	(25kHz)
TH701	Not Used	Not Used	Not Used	Not Used	Not Used	Not Used	Not Used	Not Used	Not Used	Not Used	Not Used	Not Used	Not Used	Not Used	Not Used	Not Used	Not Used	Not Used
TH701 (FTZ)	Not Used	Not Used	Not Used	G9090011 SDT1000	G9090011 SDT1000	G9090011 SDT1000	G9090011 SDT1000	G9090011 SDT1000	G9090011 SDT1000	Not Used	Not Used	Not Used	Not Used	Not Used	Not Used	Not Used	Not Used	Not Used
R706	J24205103 10k Ohm	J24205103 10k Ohm	J24205103 10k Ohm	J24205103 10k Ohm	J24205103 10k Ohm	J24205103 10k Ohm	J24205103 10k Ohm	J24205103 10k Ohm	J24205103 10k Ohm	J24205103 10k Ohm	J24205103 10k Ohm	J24205103 10k Ohm	J24205103 10k Ohm	J24205103 10k Ohm	J24205103 10k Ohm	J24205103 10k Ohm	J24205103 10k Ohm	J24205103 10k Ohm
R706 (FTZ)	J24205392 3.9k Ohm	J24205392 3.9k Ohm	J24205392 3.9k Ohm	J24205392 3.9k Ohm	J24205392 3.9k Ohm	J24205392 3.9k Ohm	J24205392 3.9k Ohm	J24205392 3.9k Ohm	J24205392 3.9k Ohm	J24205392 3.9k Ohm	J24205392 3.9k Ohm	J24205392 3.9k Ohm	J24205392 3.9k Ohm	J24205392 3.9k Ohm	J24205392 3.9k Ohm	J24205392 3.9k Ohm	J24205392 3.9k Ohm	J24205392 3.9k Ohm
R707	J24205103 10k Ohm	J24205103 10k Ohm	J24205103 10k Ohm	J24205103 10k Ohm	J24205103 10k Ohm	J24205103 10k Ohm	J24205103 10k Ohm	J24205103 10k Ohm	J24205103 10k Ohm	J24205103 10k Ohm	J24205103 10k Ohm	J24205103 10k Ohm	J24205103 10k Ohm	J24205103 10k Ohm	J24205103 10k Ohm	J24205103 10k Ohm	J24205103 10k Ohm	J24205103 10k Ohm
R707 (FTZ)	J24205471 470 Ohm	J24205471 470 Ohm	J24205471 470 Ohm	J24205471 470 Ohm	J24205471 470 Ohm	J24205471 470 Ohm	J24205471 470 Ohm	J24205471 470 Ohm	J24205471 470 Ohm	J24205471 470 Ohm	J24205471 470 Ohm	J24205471 470 Ohm	J24205471 470 Ohm	J24205471 470 Ohm	J24205471 470 Ohm	J24205471 470 Ohm	J24205471 470 Ohm	J24205471 470 Ohm
R708	J24205223 22k Ohm	J24205223 22k Ohm	J24205223 22k Ohm	J24205223 22k Ohm	J24205223 22k Ohm	J24205223 22k Ohm	J24205333 33k Ohm	J24205333 33k Ohm	J24205333 33k Ohm	J24205223 22k Ohm	J24205223 22k Ohm	J24205223 22k Ohm	J24205223 22k Ohm	J24205223 22k Ohm	J24205223 22k Ohm	J24205333 33k Ohm	J24205333 33k Ohm	J24205333 33k Ohm
R708 (FTZ)	J24205183 18k Ohm	J24205183 18k Ohm	J24205183 18k Ohm	J24205183 18k Ohm	J24205183 18k Ohm	J24205183 18k Ohm	J24205183 18k Ohm	J24205183 18k Ohm	J24205183 18k Ohm	J24205183 18k Ohm	J24205183 18k Ohm	J24205183 18k Ohm	J24205183 18k Ohm	J24205183 18k Ohm	J24205183 18k Ohm	J24205183 18k Ohm	J24205183 18k Ohm	J24205183 18k Ohm
R711	J24205154 150k Ohm	J24205184 180k Ohm	J24205184 180k Ohm	J24205154 150k Ohm	J24205184 180k Ohm	J24205184 180k Ohm	J24205154 150k Ohm	J24205184 180k Ohm	J24205184 180k Ohm	J24205154 150k Ohm	J24205184 180k Ohm	J24205184 180k Ohm	J24205154 150k Ohm	J24205184 180k Ohm	J24205184 180k Ohm	J24205154 150k Ohm	J24205184 180k Ohm	J24205184 180k Ohm
R711 (FTZ)	J24205184 180k Ohm	J24205184 180k Ohm	J24205184 180k Ohm	J24205184 180k Ohm	J24205184 180k Ohm	J24205184 180k Ohm	J24205184 180k Ohm	J24205184 180k Ohm	J24205184 180k Ohm	J24205184 180k Ohm	J24205184 180k Ohm	J24205184 180k Ohm	J24205184 180k Ohm	J24205184 180k Ohm	J24205184 180k Ohm	J24205184 180k Ohm	J24205184 180k Ohm	J24205184 180k Ohm
R714	J24205124 120k Ohm	J24205154 150k Ohm	J24205154 150k Ohm	J24205124 120k Ohm	J24205154 150k Ohm	J24205154 150k Ohm	J24205124 120k Ohm	J24205154 150k Ohm	J24205154 150k Ohm	J24205124 120k Ohm	J24205154 150k Ohm	J24205154 150k Ohm	J24205124 120k Ohm	J24205154 150k Ohm	J24205154 150k Ohm	J24205124 120k Ohm	J24205154 150k Ohm	J24205154 150k Ohm
R714 (FTZ)	J24205154 150k Ohm	J24205154 150k Ohm	J24205154 150k Ohm	J24205154 150k Ohm	J24205154 150k Ohm	J24205154 150k Ohm	J24205154 150k Ohm	J24205154 150k Ohm	J24205154 150k Ohm	J24205154 150k Ohm	J24205154 150k Ohm	J24205154 150k Ohm	J24205154 150k Ohm	J24205154 150k Ohm	J24205154 150k Ohm	J24205154 150k Ohm	J24205154 150k Ohm	J24205154 150k Ohm
R717	J24205124 120k Ohm	J24205154 150k Ohm	J24205154 150k Ohm	J24205124 120k Ohm	J24205154 150k Ohm	J24205154 150k Ohm	J24205124 120k Ohm	J24205154 150k Ohm	J24205154 150k Ohm	J24205124 120k Ohm	J24205154 150k Ohm	J24205154 150k Ohm	J24205124 120k Ohm	J24205154 150k Ohm	J24205154 150k Ohm	J24205124 120k Ohm	J24205154 150k Ohm	J24205154 150k Ohm
R717 (FTZ)	J24205154 150k Ohm	J24205154 150k Ohm	J24205154 150k Ohm	J24205154 150k Ohm	J24205154 150k Ohm	J24205154 150k Ohm	J24205154 150k Ohm	J24205154 150k Ohm	J24205154 150k Ohm	J24205154 150k Ohm	J24205154 150k Ohm	J24205154 150k Ohm	J24205154 150k Ohm	J24205154 150k Ohm	J24205154 150k Ohm	J24205154 150k Ohm	J24205154 150k Ohm	J24205154 150k Ohm
R719	J24205154 150k Ohm	J24205000 0 Ohm	J24205000 0 Ohm	J24205154 150k Ohm	J24205000 0 Ohm	J24205000 0 Ohm	J24205154 150k Ohm	J24205000 0 Ohm	J24205000 0 Ohm	J24205154 150k Ohm	J24205000 0 Ohm	J24205000 0 Ohm	J24205154 150k Ohm	J24205000 0 Ohm	J24205000 0 Ohm	J24205154 150k Ohm	J24205000 0 Ohm	J24205000 0 Ohm
R719 (FTZ)	J24205000 0 Ohm	J24205000 0 Ohm	J24205000 0 Ohm	J24205000 0 Ohm	J24205000 0 Ohm	J24205000 0 Ohm	J24205000 0 Ohm	J24205000 0 Ohm	J24205000 0 Ohm	J24205000 0 Ohm	J24205000 0 Ohm	J24205000 0 Ohm	J24205000 0 Ohm	J24205000 0 Ohm	J24205000 0 Ohm	J24205000 0 Ohm	J24205000 0 Ohm	J24205000 0 Ohm
C708	K22170239 CH 150pF	K22170235 CH 100pF	K22170235 CH 100pF	K22170239 CH 150pF	K22170235 CH 100pF	K22170235 CH 100pF	K22170239 CH 150pF	K22170235 CH 100pF	K22170235 CH 100pF	K22170239 CH 150pF	K22170235 CH 100pF	K22170235 CH 100pF	K22170239 CH 150pF	K22170235 CH 100pF	K22170235 CH 100pF	K22170239 CH 150pF	K22170235 CH 100pF	K22170235 CH 100pF
C708 (FTZ)	K22170235 CH 100pF	K22170235 CH 100pF	K22170235 CH 100pF	K22170235 CH 100pF	K22170235 CH 100pF	K22170235 CH 100pF	K22170235 CH 100pF	K22170235 CH 100pF	K22170235 CH 100pF	K22170235 CH 100pF	K22170235 CH 100pF	K22170235 CH 100pF	K22170235 CH 100pF	K22170235 CH 100pF	K22170235 CH 100pF	K22170235 CH 100pF	K22170235 CH 100pF	K22170235 CH 100pF
C712	K22170805 B 0.001uF	Not Used	Not Used	K22170805 B 0.001uF	Not Used	Not Used	K22170805 B 0.001uF	Not Used	Not Used	K22170805 B 0.001uF	Not Used	Not Used	K22170805 B 0.001uF	Not Used	Not Used	K22170805 B 0.001uF	Not Used	Not Used
C713	K22170239 CH 150pF	Not Used	Not Used	K22170239 CH 150pF	Not Used	Not Used	K22170239 CH 150pF	Not Used	Not Used	K22170239 CH 150pF	Not Used	Not Used	K22170239 CH 150pF	Not Used	Not Used	K22170239 CH 150pF	Not Used	Not Used
C809	K22170207 CH 6pF	K22170207 CH 6pF	K22170207 CH 6pF	K22170207 CH 6pF	K22170207 CH 6pF	K22170207 CH 6pF	K22170207 CH 6pF	K22170207 CH 6pF	K22170207 CH 6pF	K22170207 CH 6pF	K22170207 CH 6pF	K22170207 CH 6pF	K22170207 CH 6pF	K22170207 CH 6pF	K22170207 CH 6pF	K22170207 CH 6pF	K22170207 CH 6pF	K22170207 CH 6pF
C812	K22170215 CH 15pF	K22170215 CH 15pF	K22170215 CH 15pF	K22170213 CH 12pF	K22170213 CH 12pF	K22170213 CH 12pF	K22170211 CH 10pF	K22170211 CH 10pF	K22170211 CH 10pF	K22170213 CH 12pF	K22170215 CH 15pF	K22170215 CH 15pF	K22170215 CH 15pF	K22170213 CH 12pF	K22170213 CH 12pF	K22170213 CH 12pF	K22170213 CH 12pF	K22170213 CH 12pF

BAND TABLE IV

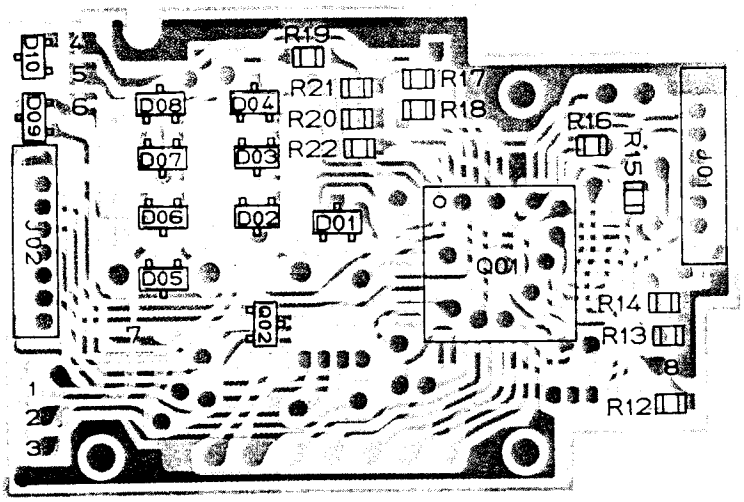
	BAND AS1 (140-153MHz)			BAND BS1 (153-167MHz)			BAND BS2 (156-170MHz)			BAND A (134-146MHz)			BAND B (146-160MHz)			BAND C (160-174MHz)		
	(12.5kHz)	(20kHz)	(25kHz)	(12.5kHz)	(20kHz)	(25kHz)	(12.5kHz)	(20kHz)	(25kHz)	(12.5kHz)	(20kHz)	(25kHz)	(12.5kHz)	(20kHz)	(25kHz)	(12.5kHz)	(20kHz)	(25kHz)
C813	K22170211 CH 10pF	K22170211 CH 10pF	K22170211 CH 10pF	K22170210 CH 9pF	K22170210 CH 9pF	K22170210 CH 9pF	K22170210 CH 9pF	K22170210 CH 9pF	K22170210 CH 9pF	K22170211 CH 10pF	K22170211 CH 10pF	K22170211 CH 10pF	K22170211 CH 10pF	K22170211 CH 10pF	K22170211 CH 10pF	K22170210 CH 9pF	K22170210 CH 9pF	K22170210 CH 9pF
C814	K22170217 CH 18pF	K22170219 CH 27pF	K22170219 CH 27pF	K22170219 CH 22pF	K22170217 CH 22pF	K22170217 CH 22pF	K22170219 CH 22pF	K22170217 CH 22pF	K22170217 CH 22pF	K22170221 CH 27pF	K22170221 CH 27pF	K22170221 CH 27pF	K22170217 CH 18pF	K22170217 CH 18pF	K22170217 CH 18pF	K22170217 CH 18pF	K22170217 CH 18pF	K22170217 CH 18pF
C815	K22170211 CH 10pF	K22170211 CH 10pF	K22170211 CH 10pF	K22170210 CH 9pF	K22170210 CH 9pF	K22170210 CH 9pF	K22170210 CH 9pF	K22170210 CH 9pF	K22170210 CH 9pF	K22170211 CH 10pF	K22170211 CH 10pF	K22170211 CH 10pF	K22170211 CH 10pF	K22170211 CH 10pF	K22170211 CH 10pF	K22170210 CH 9pF	K22170210 CH 9pF	K22170210 CH 9pF
C816	K22170213 CH 12pF	K22170215 CH 15pF	K22170215 CH 15pF	K22170215 CH 15pF	K22170213 CH 12pF	K22170213 CH 12pF	K22170213 CH 12pF	K22170213 CH 12pF	K22170213 CH 12pF	K22170215 CH 15pF	K22170215 CH 15pF	K22170215 CH 15pF	K22170213 CH 12pF	K22170213 CH 12pF	K22170213 CH 12pF	K22170211 CH 10pF	K22170211 CH 10pF	K22170211 CH 10pF
C817	K22170229 CH 56pF	K22170229 CH 56pF	K22170229 CH 56pF	K22170229 CH 56pF	K22170229 CH 56pF	K22170229 CH 56pF	K22170229 CH 56pF	K22170229 CH 56pF	K22170229 CH 56pF	K22170229 CH 56pF	K22170229 CH 56pF	K22170229 CH 56pF	K22170229 CH 56pF	K22170229 CH 56pF	K22170229 CH 56pF	K22170229 CH 56pF	K22170229 CH 56pF	K22170229 CH 56pF
C818	K22170229 CH 56pF	K22170229 CH 56pF	K22170229 CH 56pF	K22170229 CH 56pF	K22170229 CH 56pF	K22170229 CH 56pF	K22170229 CH 56pF	K22170229 CH 56pF	K22170229 CH 56pF	K22170229 CH 56pF	K22170229 CH 56pF	K22170229 CH 56pF	K22170229 CH 56pF	K22170229 CH 56pF	K22170229 CH 56pF	K22170229 CH 56pF	K22170229 CH 56pF	K22170229 CH 56pF
L802	L0021765	L0020736	L0020736	L0020736	L0021765	L0021765	L0021765	L0021765	L0021765	L0020736	L0020736	L0020736	L0021765	L0021765	L0021765	L0021765	L0021765	L0021765
L803	L0021765	L0020736	L0020736	L0020736	L0021765	L0021765	L0021765	L0021765	L0021765	L0020736	L0020736	L0020736	L0021765	L0021765	L0021765	L0021765	L0021765	L0021765

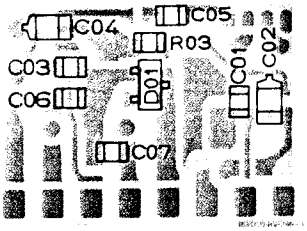




(Obverse view of "Xtal" side)

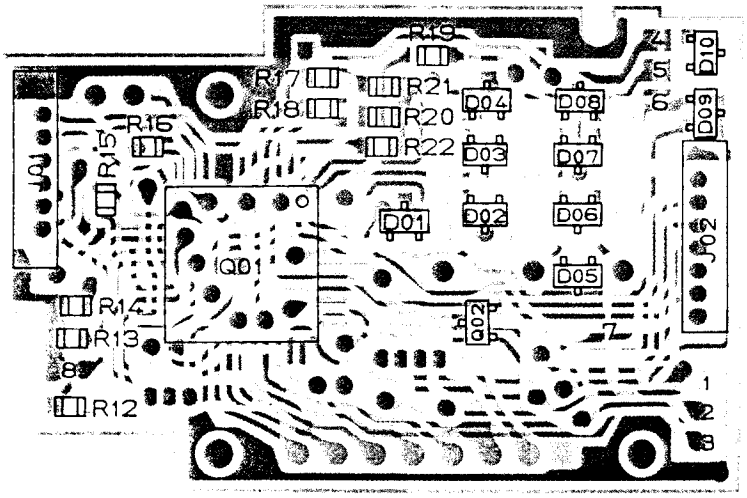
CNTL UNIT
(Obverse view of "switch" side)

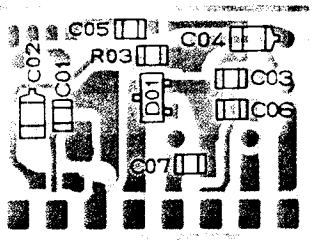




(Obverse view of "chip-only" side)

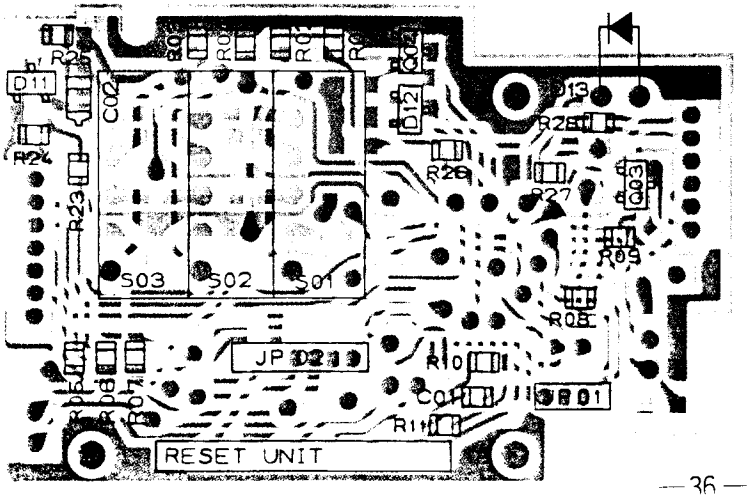
CNTL UNIT
(Obverse view of "IC" side)

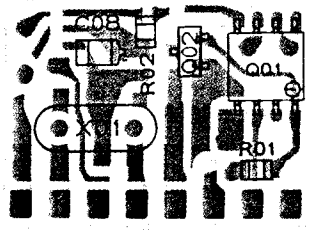




(Reverse view of "chip-only" side)

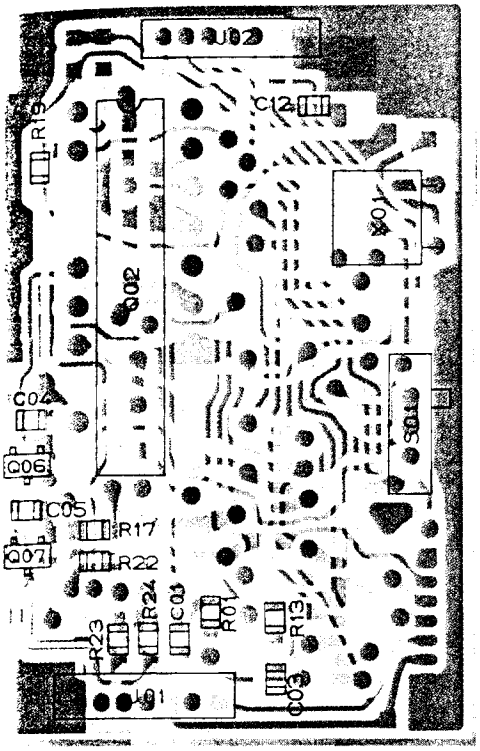
CNTL UNIT
(Reverse view of "IC" side)



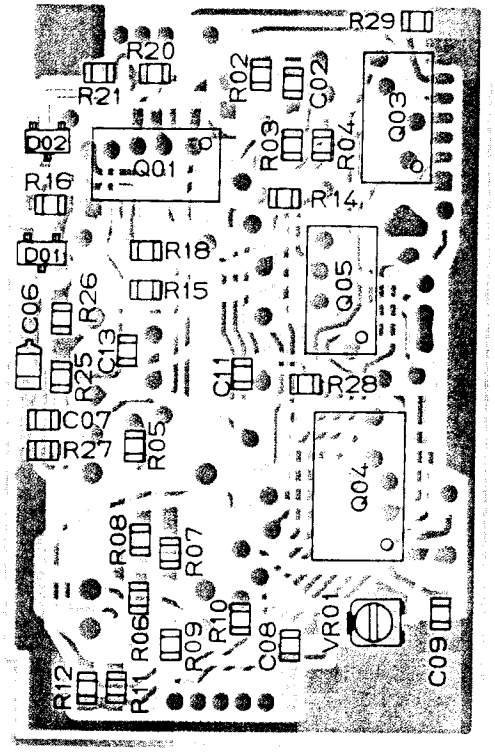


(Reverse view of "X'tal" side)

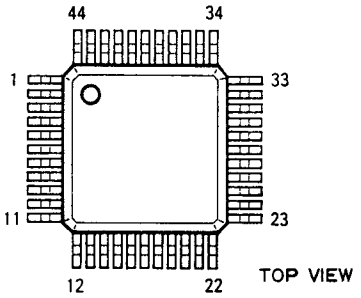
CNTL UNIT
(Reverse view of "switch" side)



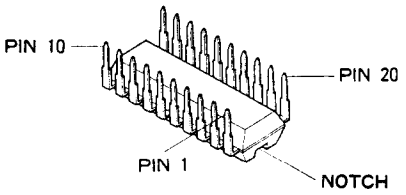
(Obverse view of "Xtal" side



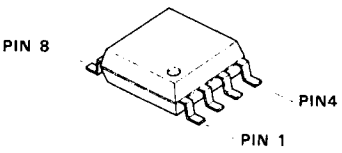
(Obverse view of "chip-only" side)



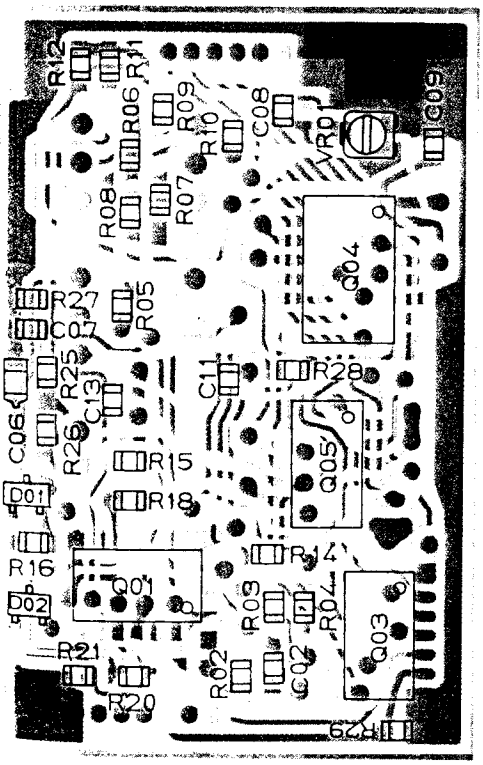
μPD7507HG(Q101)



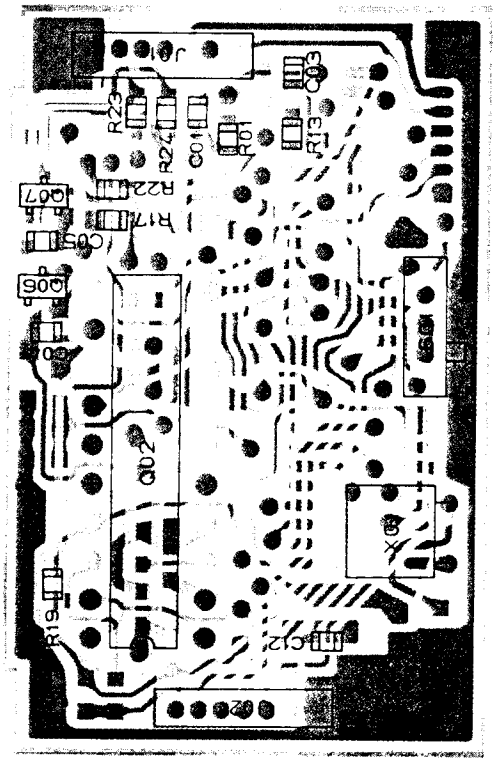
LTC1060ACN(Q302)



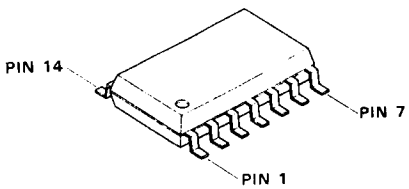
PST531A(Q201)



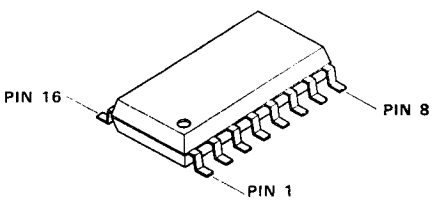
(Reverse view of "chip-only" side)



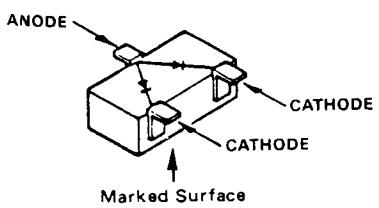
(Reverse view of "Xtal" side)



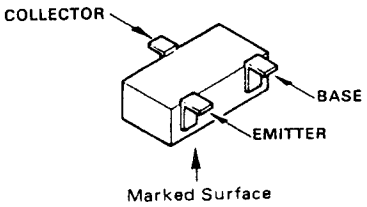
μPC324G(Q301)
μPD74HC74G(Q305)
μPD74HC4066G(Q303)



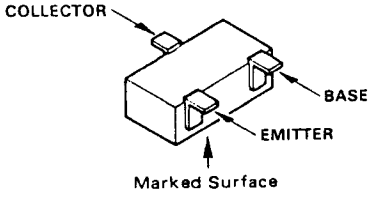
MB87006AFP(Q304)



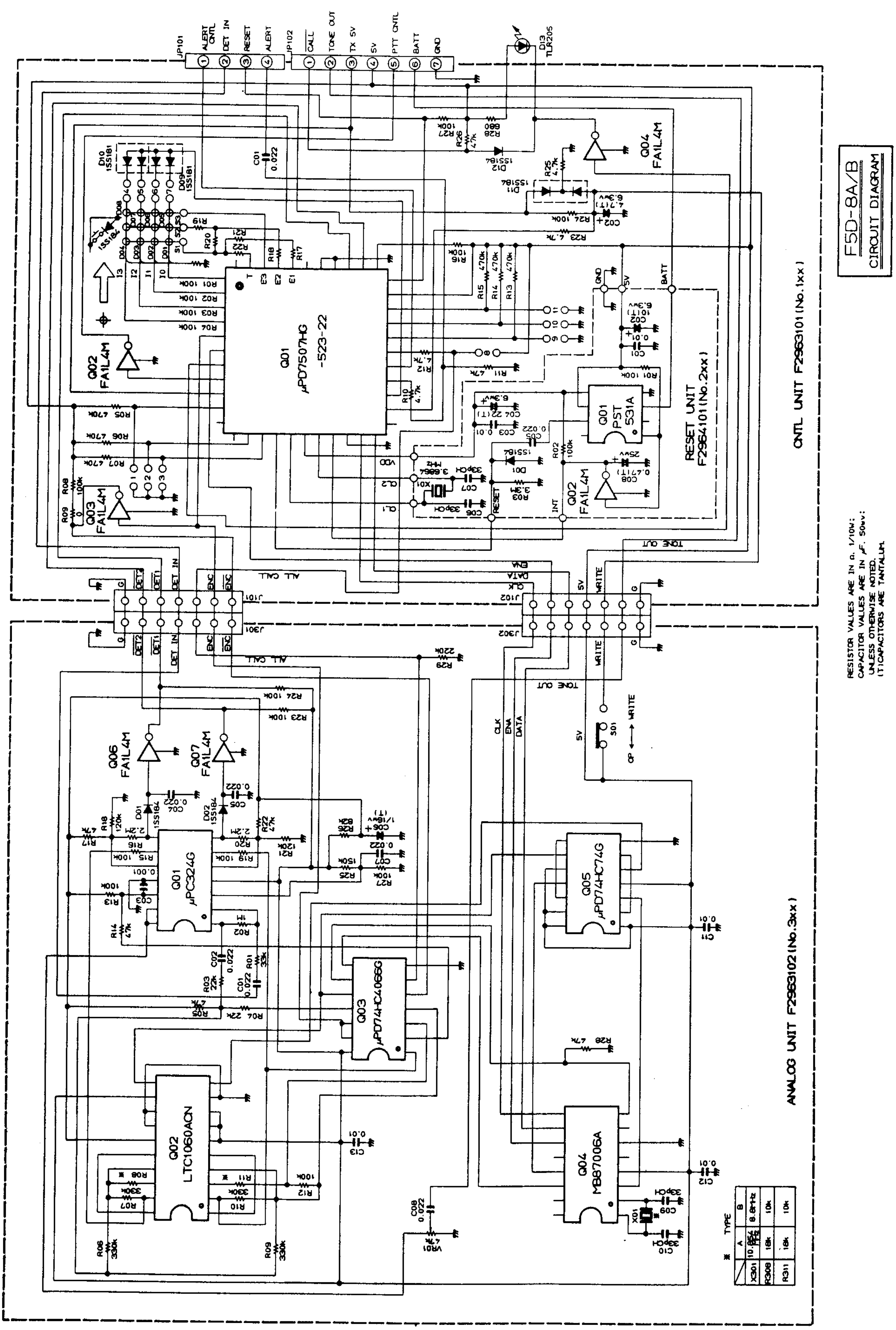
1SS181(D109,110,302)
(A3)



1SS184 (B3) (D101~108,111 112,201,301)



FA1L4M(L31)
(Q102,103,104, 202,306,307)


F5D-8A/B
CIRCUIT DIAGRAM
CNTL UNIT F2963101(No.1xx)
RESET UNIT F2964101(No.2xx)
ANALOG UNIT F2963102(No.3xx)
Q01 μPD7507HG -523-22
Q01 PST 531A
Q01 μPC324G
Q02 LTC1060ACN
Q03 μPD74HC4066G
Q04 MB87006A
Q05 μPD74HC74G
RESISTOR VALUES ARE IN Ω, 1/10W;
CAPACITOR VALUES ARE IN μF, 50WV;
UNLESS OTHERWISE NOTED.
(T) CAPACITORS ARE TANTALUM.

Decoder

Demodulated receiver audio is amplified and limited by one section of quad opamp Q301 (uPC324G) before filtering by dual SCF peak filter IC Q302 (LTC1060CN).

The center frequencies of the two peak filters (one for private calling tones and the other for the group tone) are controlled by programmable clock signals derived from 10.854 MHz crystal X301, divided by Q304 (MB87006A) and shaped by Q305 (uPD74HC-74G). Valid tone signals passing through Q302 are returned to two sections of Q301 for detection and signalling to the CNTL Unit via one of inverters Q306 or Q307 (FA1L4M x2).

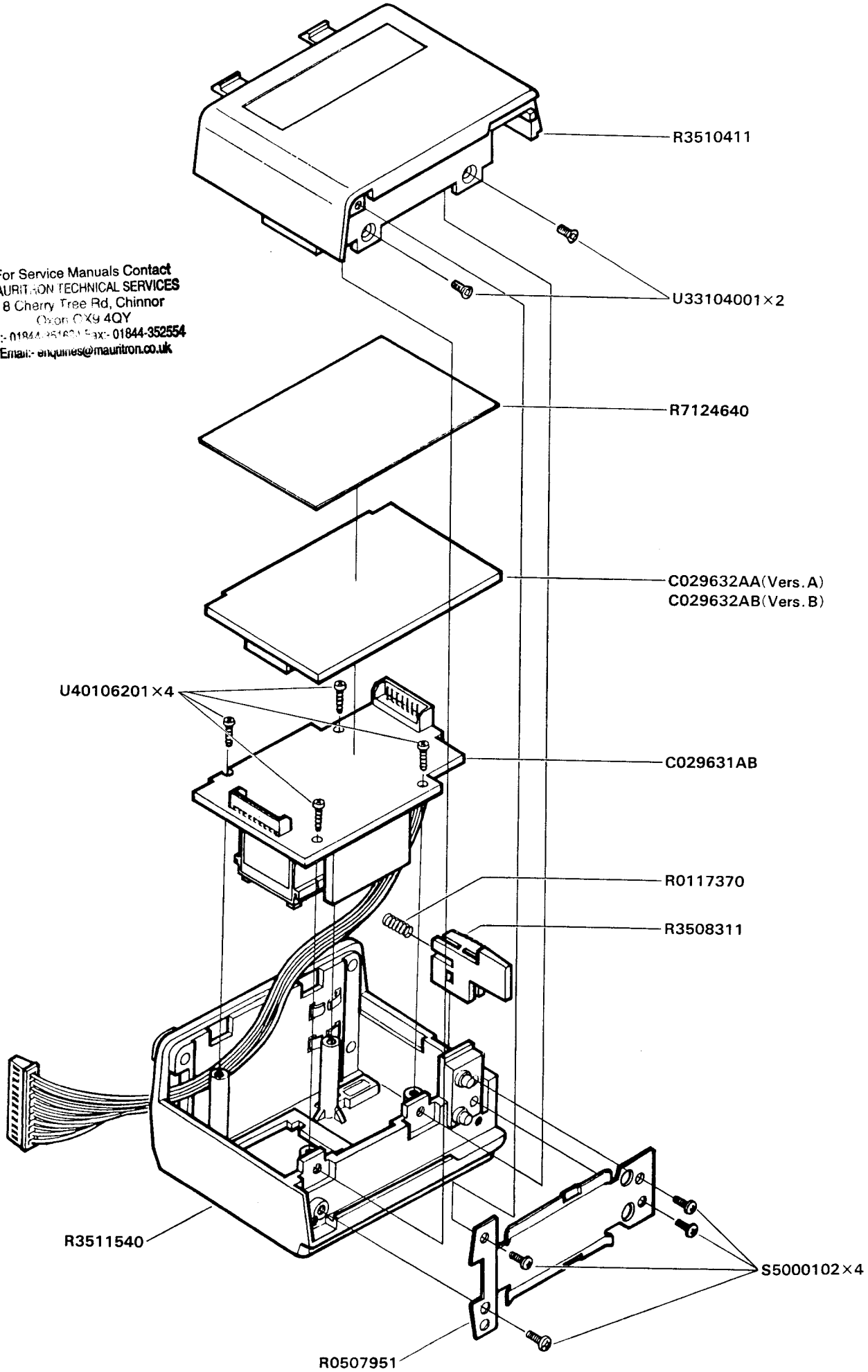
When a valid tone has been received, microprocessor Q101 (uPD7507HG-523-22) on the CNTL Unit sends serial instructions to clock divider Q304 to change the filter clock frequency to match the next programmed tone.

If five tones are received matching those programmed, an alerting tone is generated and passed to the receiver audio amplifier to signal the operator. The transpond tone is also generated when the transpond feature is activated.

Encoder

When the PTT switch is pressed to transmit, microprocessor Q101 instructs clock divider Q304 to generate pulses at twice the required tone frequency. Q305 then reshapes these pulses into a square wave at the required frequency, which is passed through encode/decode analog switch Q303 (uPD74HC4066G) and filtered by Q302 to form a sign wave. The resulting sign wave is amplified by one section of Q301 before delivered to the modulator.

F5D-8



*** CNTL UNIT ***

F2963101 Printed Circuit Board

C029631AA PCB w/Components,w/o Reset unit
C029631AB PCB w/Components,w/ Reset unit

Q101	G1090866	IC	LTC1060ACN
Q102	G3070013	Transistor	FA1L4M-T2B
Q103	G3070013	Transistor	FA1L4M-T2B
Q104	G3070013	Transistor	FA1L4M-T2B
D101	G2070009	Diode	1SS184 TE85R
D102	G2070009	Diode	1SS184 TE85R
D103	G2070009	Diode	1SS184 TE85R
D104	G2070009	Diode	1SS184 TE85R
D105	G2070009	Diode	1SS184 TE85R
D106	G2070009	Diode	1SS184 TE85R
D107	G2070009	Diode	1SS184 TE85R
D108	G2070009	Diode	1SS184 TE85R
D109	G2070001	Diode	1SS181 TE85R
D110	G2070001	Diode	1SS181 TE85R
D111	G2070009	Diode	1SS184 TE85R
D112	G2070009	Diode	1SS184 TE85R
D113	G2090137	Diode	TLR205
R101	J24205104	Chip Res.	100k Ohm 1/10W
R102	J24205104	Chip Res.	100k Ohm 1/10W
R103	J24205104	Chip Res.	100k Ohm 1/10W
R104	J24205104	Chip Res.	100k Ohm 1/10W
R105	J24205474	Chip Res.	470k Ohm 1/10W
R106	J24205474	Chip Res.	470k Ohm 1/10W
R107	J24205474	Chip Res.	470k Ohm 1/10W
R108	J24205104	Chip Res.	100k Ohm 1/10W
R109	J24205000	Chip Res.	0 Ohm 1/10W
R110	J24205472	Chip Res.	4.7k Ohm 1/10W
R111	J24205473	Chip Res.	47k Ohm 1/10W
R112	J24205472	Chip Res.	4.7k Ohm 1/10W
R113	J24205474	Chip Res.	470k Ohm 1/10W
R114	J24205474	Chip Res.	470k Ohm 1/10W
R115	J24205474	Chip Res.	470k Ohm 1/10W
R116	J24205104	Chip Res.	100k Ohm 1/10W
R118	J24205000	Chip Res.	0 Ohm 1/10W
R120	J24205000	Chip Res.	0 Ohm 1/10W
R123	J24205472	Chip Res.	4.7k Ohm 1/10W
R124	J24205104	Chip Res.	100k Ohm 1/10W
R125	J24205472	Chip Res.	4.7k Ohm 1/10W
R126	J24205473	Chip Res.	47k Ohm 1/10W
R127	J24205104	Chip Res.	100k Ohm 1/10W
R128	J24205681	Chip Res.	680 Ohm 1/10W
C101	K22140807	Chip Cap.	0.022uF 25V B
C102	K78080002	Tantalum Chip Cap.	4.7uF 6.3V
S101	N7090071	Thumbwheel Switch	A7C-S106
S102	N7090071	Thumbwheel Switch	A7C-S106
S103	N7090071	Thumbwheel Switch	A7C-S106
	S6000127	Dummy Switch	A7C-1PC
J101	S6000652	Connector	53022-0710
J102	S6000652	Connector	53022-0710
J101	T9205676	Wire Assy	

*** RESET UNIT ***

F2964101 Printed Circuit Board

C029641AA PCB w/ Components

Q201	G1090867	IC	PST531A
Q202	G3070013	Transistor	FA1L4M-T2B
D201	G2070009	Diode	1SS184 TE85R
X201	H0102674	Crystal	HC-43U/4 3.686MHz
	R7076390	Crystal Spacer	
R201	J24205104	Chip Res.	100k Ohm
R202	J24205104	Chip Res.	100k Ohm
R203	J24205335	Chip Res.	3.3M Ohm
C201	K22170817	Chip Cap.	0.01uF 50V B
C202	K78080003	Tantalum Chip Cap.	10uF 6.3V
C203	K22170817	Chip Cap.	0.01uF 50V B
C204	K78080015	Tantalum Chip Cap.	22uF 6.3V
C205	K22170807	Chip Cap.	0.022uF 50V B
C206	K22170223	Chip Cap.	33pF 50V CH
C207	K22170223	Chip Cap.	33pF 50V CH
C208	K78140012	Tantalum Chip Cap.	0.47uF 25V

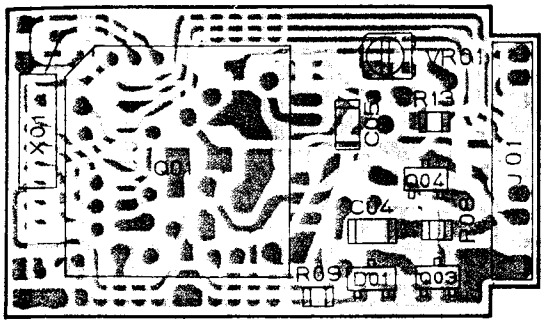
*** ANALOG UNIT ***

F2963102 Printed Circuit Board

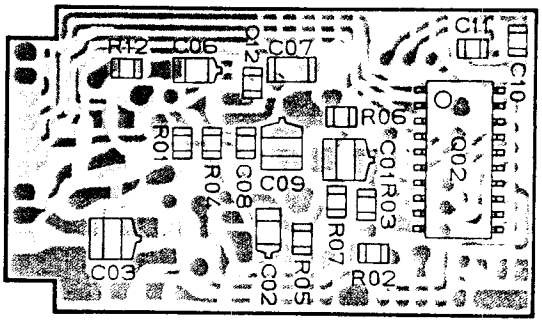
C029632AA PCB w/Components F5D-8A (ZVEI)
C029632AB PCB w/Components F5D-8B (CCIR)

Q301	G1090603	IC	uPC324G
Q302	G1090889	IC	LTC1060ACN
Q303	G1090871	IC	uPD74HC4066G
Q304	G1090869	IC	MB87006AFP-G-BND
Q305	G1090872	IC	uPD74HC74G
Q306	G3070013	Transistor	FA1L4M-T2B
Q307	G3070013	Transistor	FA1L4M-T2B
D301	G2070009	Diode	1SS184 TE85R
D302	G2070001	Diode	1SS181 TE85R
X301	H0102880	Crystal(F5D-8A)	UM-1 10.854MHz
X301	H0102881	Crystal(F5D-8B)	UM-1 8.8MHz

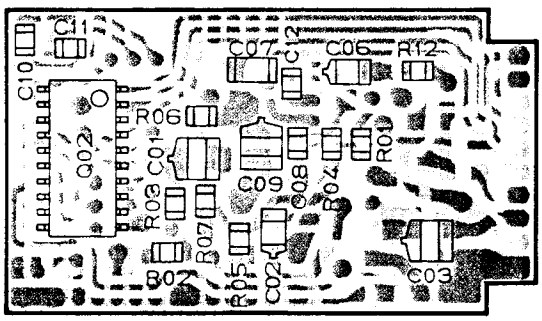
R301	J24205333	Chip Res.	33k Ohm		1/10W
R302	J24205105	Chip Res.	1M Ohm		1/10W
R303	J24205223	Chip Res.	22k Ohm		1/10W
R304	J24205223	Chip Res.	22k Ohm		1/10W
R305	J24205473	Chip Res.	47k Ohm		1/10W
R306	J24205334	Chip Res.	330k Ohm		1/10W
R307	J24205334	Chip Res.	330k Ohm		1/10W
R308	J24205183	Chip Res.(ZVEI)	18k Ohm		1/10W
R308	J24205103	Chip Res.(CCIR)	10k Ohm		1/10W
R309	J24205334	Chip Res.	330k Ohm		1/10W
R310	J24205334	Chip Res.	330k Ohm		1/10W
R311	J24205183	Chip Res.(ZVEI)	18k Ohm		1/10W
R311	J24205103	Chip Res.(CCIR)	10k Ohm		1/10W
R312	J24205104	Chip Res.	100k Ohm		1/10W
R313	J24205104	Chip Res.	100k Ohm		1/10W
R314	J24205473	Chip Res.	47k Ohm		1/10W
R315	J24205104	Chip Res.	100k Ohm		1/10W
R316	J24205225	Chip Res.	2.2M Ohm		1/10W
R317	J24205473	Chip Res.	47k Ohm		1/10W
R318	J24205124	Chip Res.	120k Ohm		1/10W
R319	J24205104	Chip Res.	100k Ohm		1/10W
R320	J24205225	Chip Res.	2.2M Ohm		1/10W
R321	J24205124	Chip Res.	120k Ohm		1/10W
R322	J24205473	Chip Res.	47k Ohm		1/10W
R323	J24205104	Chip Res.	100k Ohm		1/10W
R324	J24205104	Chip Res.	100k Ohm		1/10W
R325	J24205154	Chip Res.	150k Ohm		1/10W
R326	J24205823	Chip Res.	82k Ohm		1/10W
R327	J24205104	Chip Res.	100k Ohm		1/10W
R328	J24205473	Chip Res.	47k Ohm		1/10W
R329	J24205224	Chip Res.	220k Ohm		1/10W
VR301	J51778473	Potentiometer	47k Ohm		
C301	K22140807	Chip Cap.	0.022uF	25V	B
C302	K22140807	Chip Cap.	0.022uF	25V	B
C303	K22170805	Chip Cap.	0.001uF	50V	B
C304	K22140807	Chip Cap.	0.022uF	25V	B
C305	K22140807	Chip Cap.	0.022uF	25V	B
C306	K78120013	Tanlalum Chip Cap.	1uF	16V	
C307	K22140807	Chip Cap.	0.022uF	25V	B
C308	K22140807	Chip Cap.	0.022uF	25V	B
C309	K22170223	Chip Cap.	33pF	50V	CH
C310	K22170223	Chip Cap.	33pF	50V	CH
C311	K22170817	Chip Cap.	0.01uF	50V	B
C312	K22170817	Chip Cap.	0.01uF	50V	B
C313	K22170817	Chip Cap.	0.01uF	50V	B
S301	N6090060	Slide Switch	SSSS71		
J301	P1090604	Connector	55024-0710		
J302	P1090604	Connector	55024-0710		



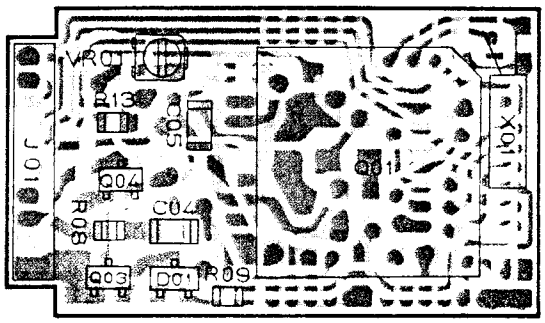
(Obverse view of "mixed-component" side)



(Obverse view of "chip-only" side)



(Reverse view of "chip-only side)



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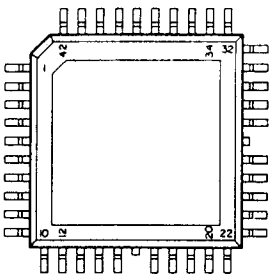
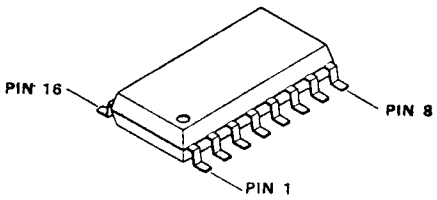
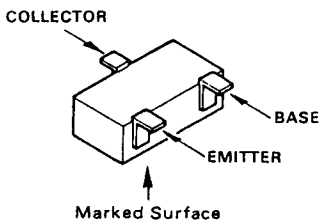


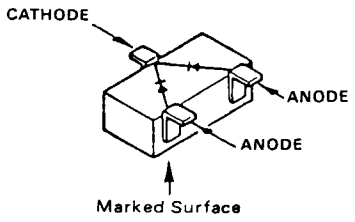
MN6520(Q01)



μPD4094BG(Q02)

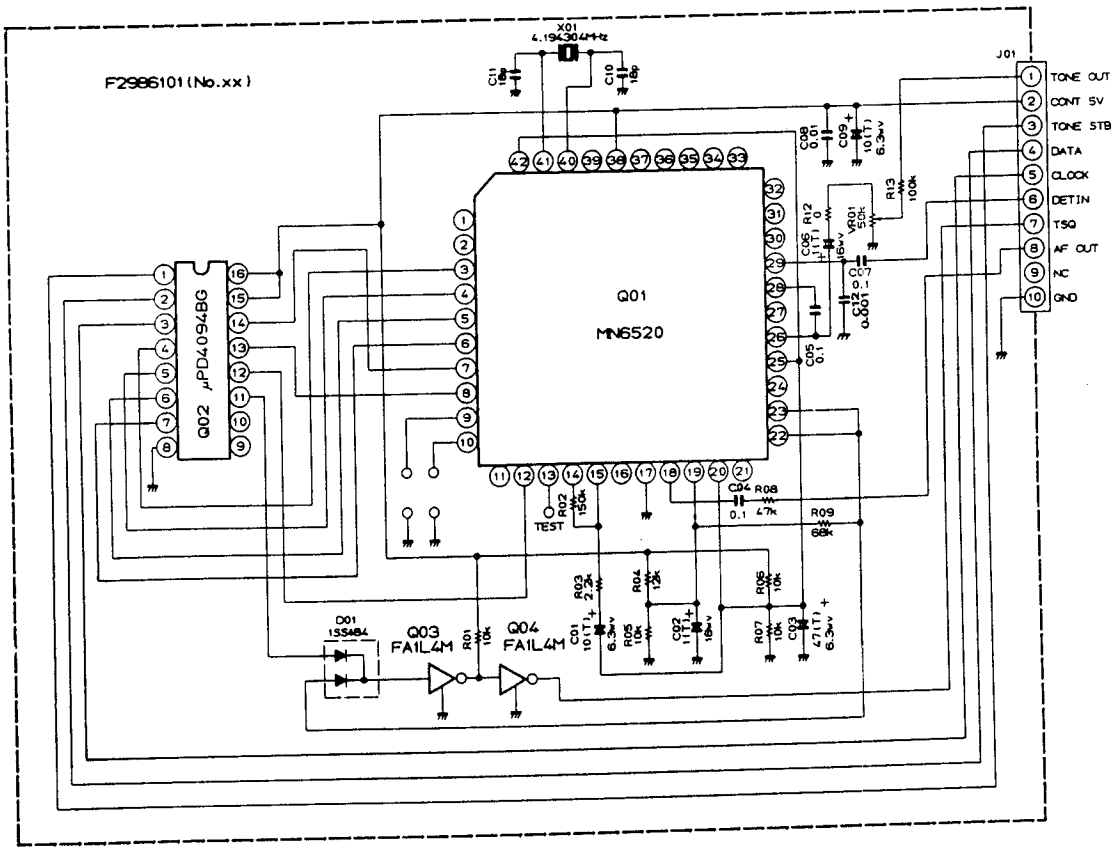


FA1L4M(L31)(Q03,04)



1SS184(B3)(D01)

	F2986101	Printed Circuit Board		
Q01	G1090577	IC	MN6520	
Q02	G1090696	IC	uPD4094BG	
Q03	G3070013	Transistor	FA1L4M-T2B	
Q04	G3070013	Transistor	FA1L4M-T2B	
D01	G2070009	Diode	1SS184 TE85R	
X01	H0102571	Crystal	MS41F	4.1943 MHz
R01	J24205103	Chip Res.	10k Ohm	1/10W
R02	J24205154	Chip Res.	150k Ohm	1/10W
R03	J24205222	Chip Res.	2.2k Ohm	1/10W
R04	J24205123	Chip Res.	12k Ohm	1/10W
R05	J24205103	Chip Res.	10k Ohm	1/10W
R06	J24205103	Chip Res.	10k Ohm	1/10W
R07	J24205103	Chip Res.	10k Ohm	1/10W
R08	J24205473	Chip Res.	47k Ohm	1/10W
R09	J24205683	Chip Res.	68k Ohm	1/10W
R12	J24205000	Chip Res.	0 Ohm	1/10W
R13	J24205104	Chip Res.	100k Ohm	1/10W
VR01	J51771503	Potentiometer	50k Ohm	
C01	K78080003	Tantalum Chip Cap.	10uF	6.3V
C02	K78120013	Tantalum Chip Cap.	1uF	16V
C03	K78080013	Tantalum Chip Cap.	47uF	6.3V
C04	K22141809	Chip Cap.	0.1uF	25V B
C05	K22141809	Chip Cap.	0.1uF	25V B
C06	K78120013	Tantalum Chip Cap.	1uF	16V
C07	K22141809	Chip Cap.	0.1uF	25V B
C08	K22170817	Chip Cap.	0.01uF	50V B
C09	K78080003	Tantalum Chip Cap.	10uF	6.3V
C10	K22170217	Chip Cap.	18pF	50V CH
C11	K22170217	Chip Cap.	18pF	50V CH
C12	K22170805	Chip Cap.	0.001uF	50V B
J01	P0090600	Connector	IL-Y-10P-S15T2-E	



RESISTOR VALUES ARE IN Ω, 1/10W;
CAPACITOR VALUES ARE IN μF, 50WV; UNLESS OTHERWISE NOTED.

FTS-16
CIRCUIT DIAGRAM