

FT-203R

TECHNICAL SUPPLEMENT



This booklet contains supplemental technical information related to the FT-203R for use with the FT-203R Operating Manual. Service or repairs to the FT-203R transceiver should be performed by qualified technicians only.

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CHIP COMPONENT INFORMATION

Transistors

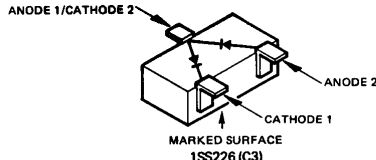
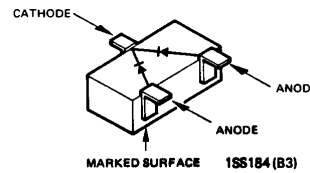
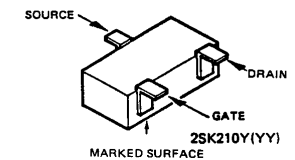
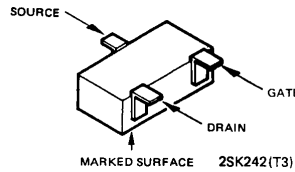
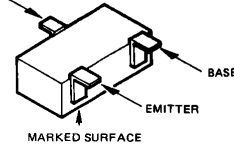
Location	Nomenclature	Mark
Q2010,2013,2015,2020,2021,2022,2025	2SA1162GR	S G
Q1002,1003,1004,1013,1014,2004,2005,2006	2SC2620B	Q B
Q1006,1007,1010,1012,2011,2014,2018,2019,2023,2024,2026,2027	2SC2712GR	L G
Q1015,2003	2SC2759	U22
Q1001	2SC3356	R22

Example:
Nomen. Code

S G

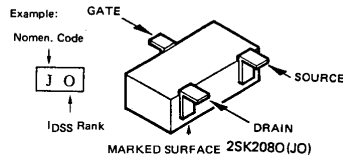
hFE Rank

COLLECTOR



FETs

Q2017	2SK208O	J O
Q2001	2SK210Y	Y Y
Q2002	2SK242	T3



Diodes (dual, common cathode)

D1017,2012,2013,2016	1SS184	B 3
D2017	1SS226	C 3

Example:
Nomen. Code (1SS182-1SS184)

B 3

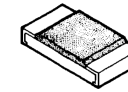
V_R Rating (80V)

B1 = 1SS182 (30V)
B2 = 1SS183 (50V)
B3 = 1SS184 (80V)
C1 = 1SS224 (30V)
C2 = 1SS225 (50V)
C3 = 1SS226 (80V)

Resistors

Type RMC 1/10W

Marking* A1 Z6

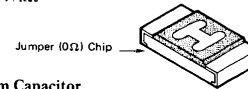


Value code		Multiplier code	
A	1.0	N	3.3
B	1.1	P	3.6
C	1.2	Q	3.9
D	1.3	R	4.3
E	1.5	S	4.7
F	1.6	T	5.1
G	1.8	U	5.6
H	2.0	V	6.2
J	2.2	W	6.8
K	2.4	X	7.5
L	2.7	Y	8.2
M	3.0	Z	9.1

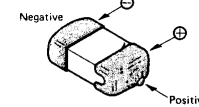
0	1
1	10 ¹
2	10 ²
3	10 ³
4	10 ⁴
5	10 ⁵
6	10 ⁶

Examples:

A1 = 10Ω
J3 = 2.2kΩ
S4 = 47kΩ

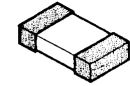


Tantalum Capacitor



Polarized, Unmarked
(determine value from layout and Parts List)

Ceramic Capacitors



Types: C2012

C3216

Marking* C3216 (Bar) C2012

A5

Value code		Multiplier code	
A	1.0	M	3.0
B	1.1	N	3.3
C	1.2	P	3.6
D	1.3	Q	3.9
E	1.5	R	4.3
F	1.6	S	4.7
G	1.8	T	5.1
H	2.0	U	5.6
J	2.2	V	6.2
K	2.4	W	6.8
L	2.7	X	7.5
		Y	8.2
		Z	9.1

0	1
1	10 ¹
2	10 ²
3	10 ³
4	10 ⁴
5	10 ⁵
6	10 ⁶
7	-
8	10 ⁻²
9	10 ⁻¹

C3216 types use a bar marking for either thermal coefficient or tolerance ranking, (according to capacitance value range) as below

Temperature Compensating Types (low values)		No bar = SL-type	
NPO(CH)	N150(PH)	N220(RH)	N330(SH)
		N470(TH)	N750(UJ)

Dielectric Constant (Hi Ki) Types (high values)

B	D

Examples:

A1 = 10pF NPO
J31 = 0.0022μF D
IA3 = 0.001μF B

Cap. Tolerance

B = 10%

D = 20%

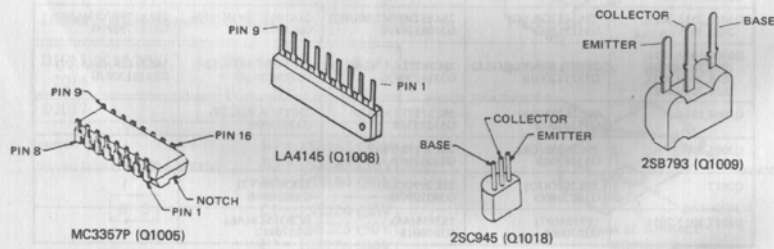
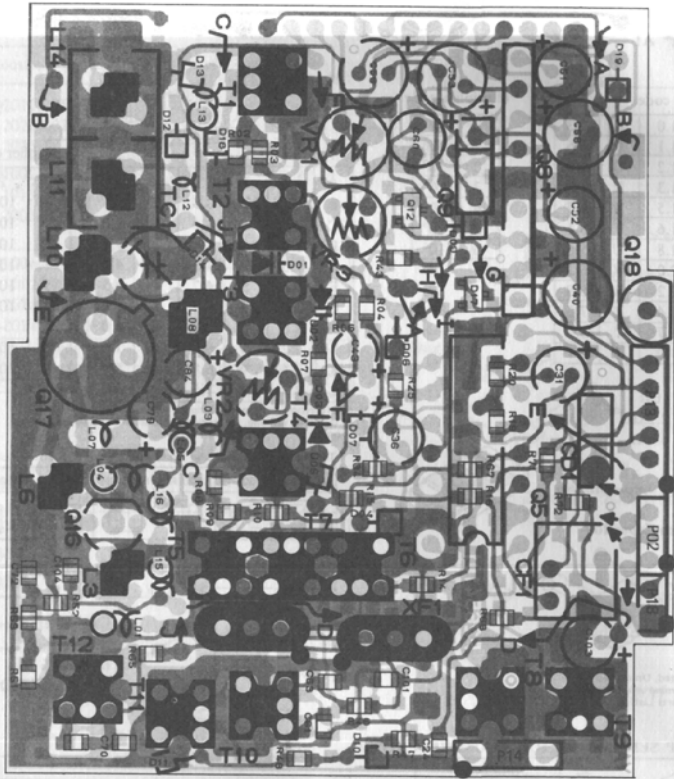
F = +80%/-20%

CHIP SEMICONDUCTOR CROSS-REFERENCE

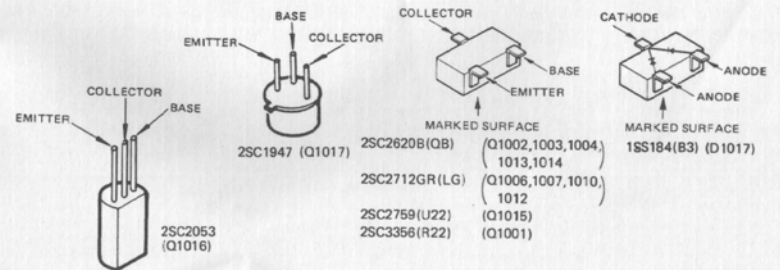
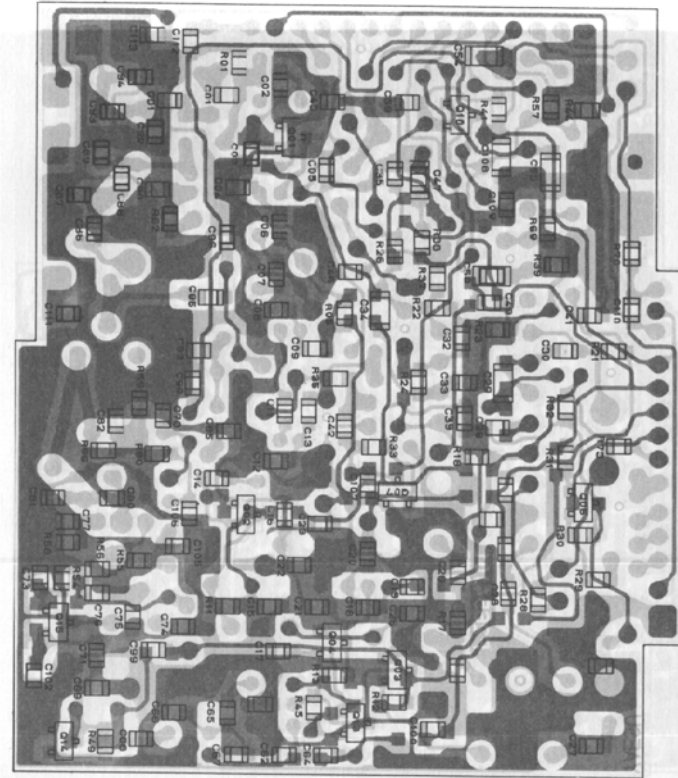
PART LOCATION NO.	ORIGINAL	REPLACEMENT		
	NOMENCLATURE (MARKING) AND PART NUMBER	NOMENCLATURE (MARKING) AND PART NUMBER		
Q2010,2013,2015,2020,2025	2SA1162GR(SG) G3111620G	2SA812M6/M7(M6/M7) G3108120F/G	2SA1052C/D(MC/MD) G3110520C/D	2SA1179F/G(M6/M7) G3111790F/G
Q1006,1007,1010,1012,2011,2014,2018,2019,2023,2024,2026,2027	2SC2712GR(BL(LG/LL) G3327120G/B	2SC1623L6/L7(L6/L7) G3316230F/G	2SC2462C/D(LC/LD) G3324620C/D	2SC2812F/G(L6/L7) G3328120F/G
Q1004,1014	2SC2620B(QB) G3326200B	2SC2757T33(T33) G3327570B	2SC2759U22(U22) G3327590B	
Q2005,2006	2SC2620B(QB) G3326200B	2SC2619B(FB) G3326190B		
Q2017	2SK208O(JO) G3802080O	2SK209O(XO) G3802090O	2SK303B(V2) G3803030B	
D1017,2013,2016	1SS184(B3) G2070009	1S2838(A6) G2070018	DCB015T(A6) G2070012	

* Semiconductors not listed above may be replaced only with original types.

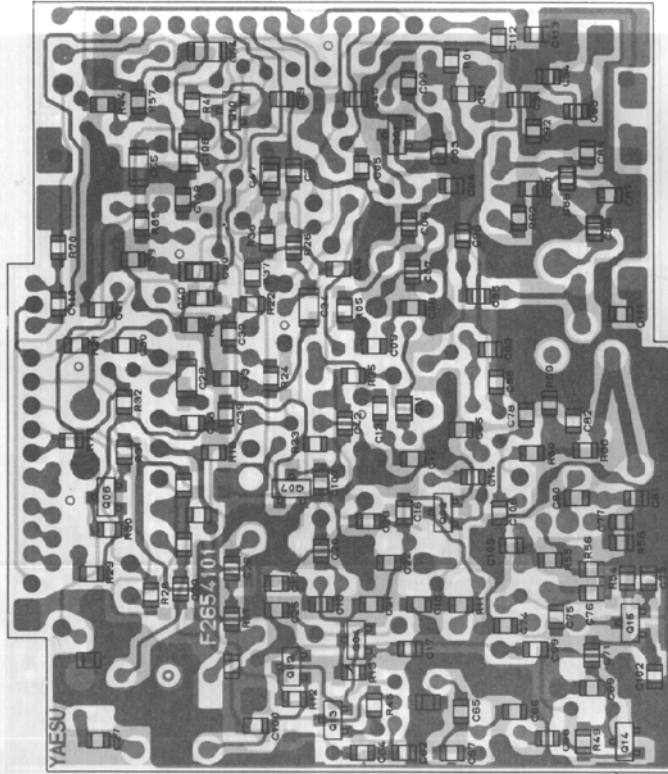
MAIN UNIT PARTS LAYOUT
(obverse view of 'mixed component' side)



MAIN UNIT PARTS LAYOUT
(reverse view of 'chip-only' side)

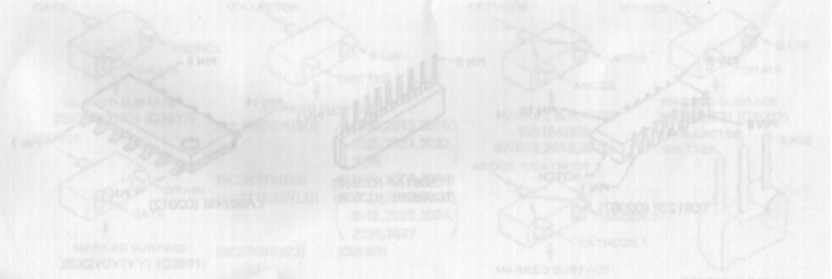
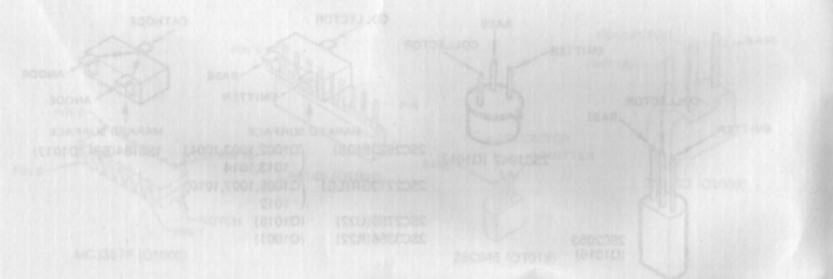
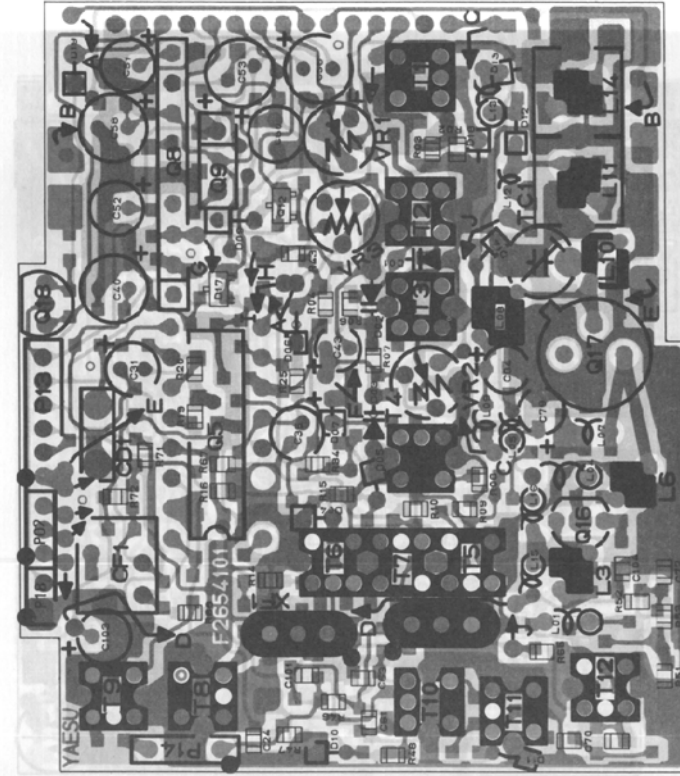


MAIN UNIT PARTS LAYOUT
(obverse view 'chip-only' side)

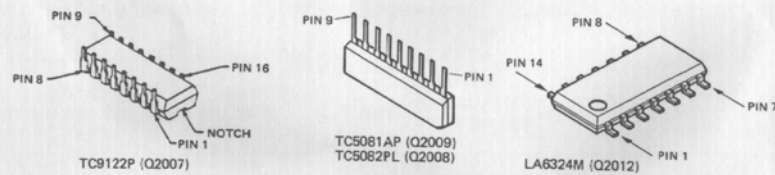
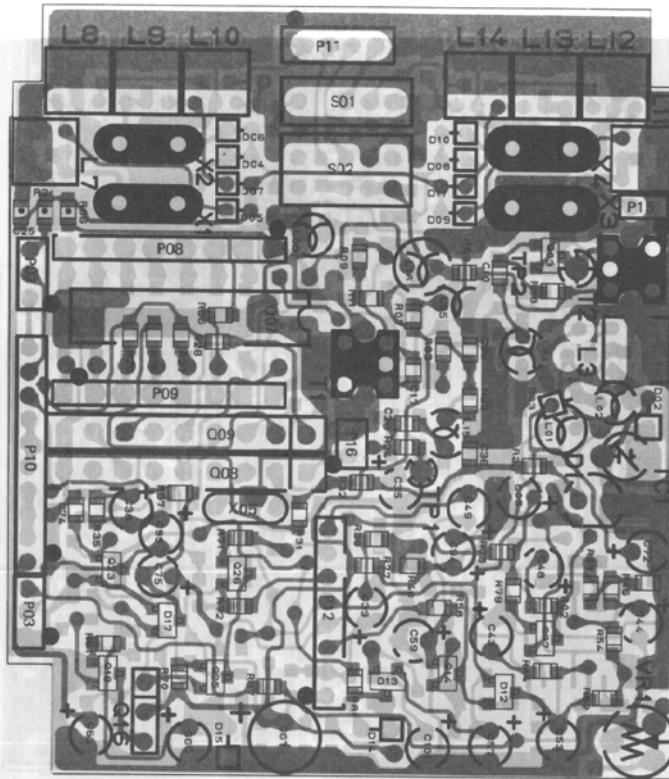


↑ ↓

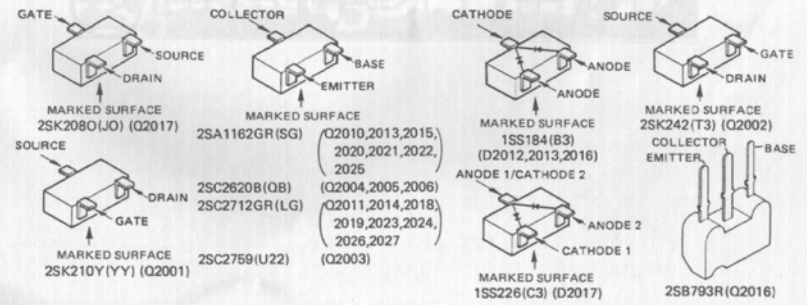
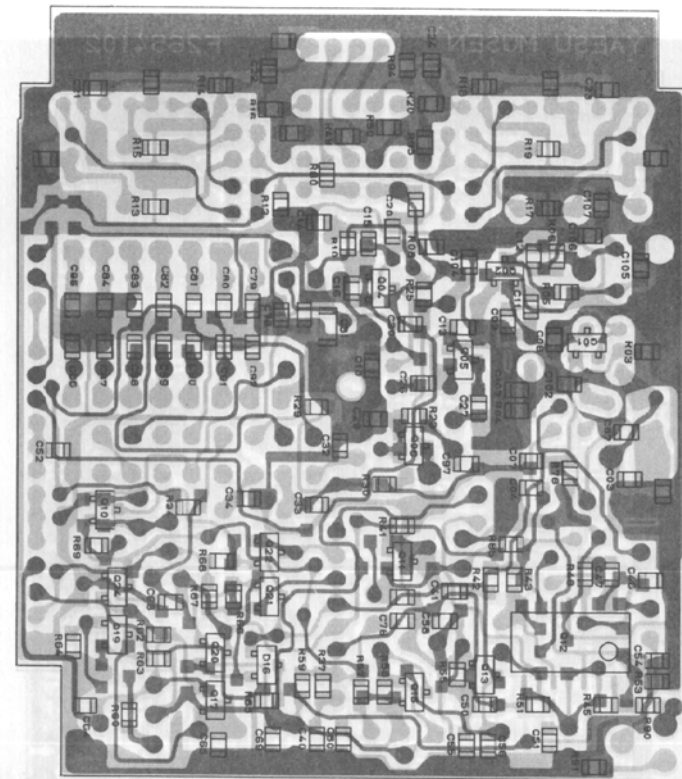
MAIN UNIT PARTS LAYOUT
(reverse view of 'mixed component' side)



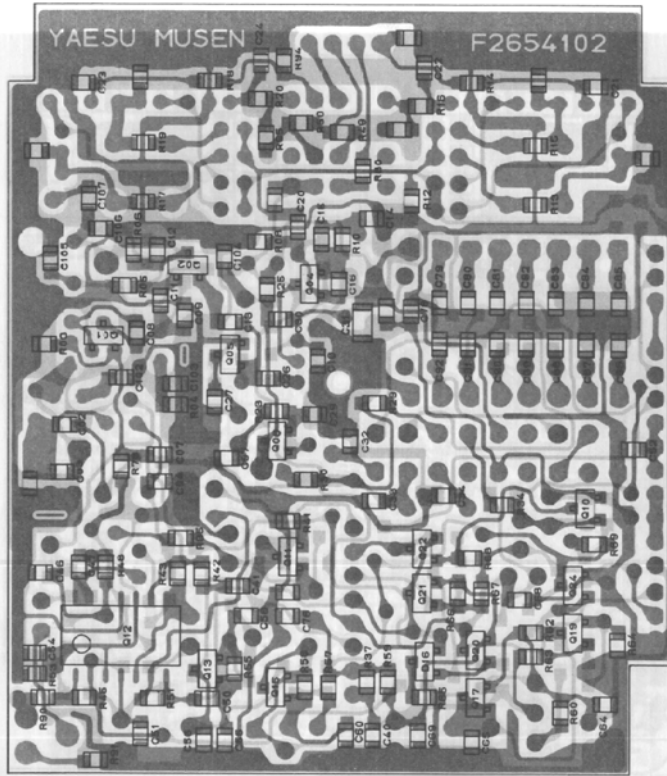
PLL UNIT PARTS LAYOUT
(obverse view of 'mixed component' side)



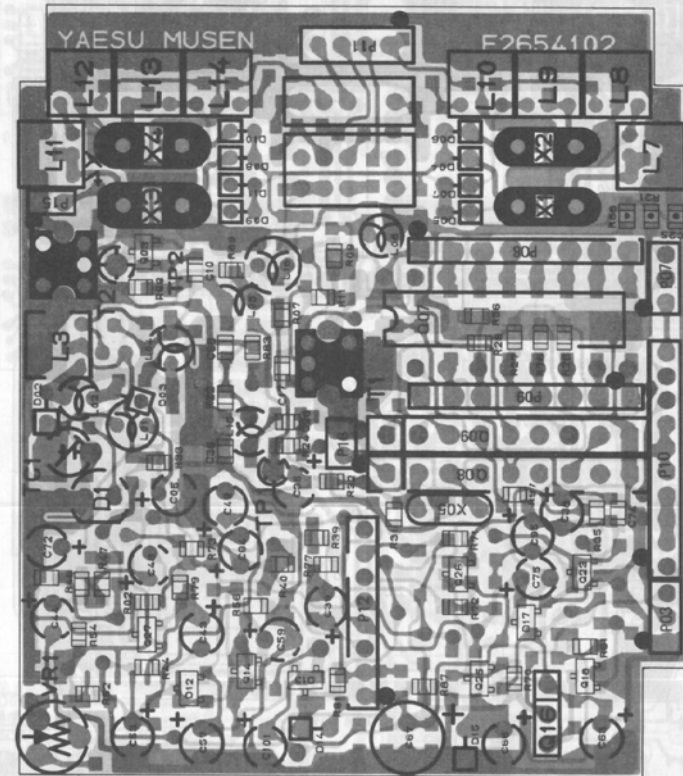
PLL UNIT PARTS LAYOUT
(reverse view of 'chip-only' side)



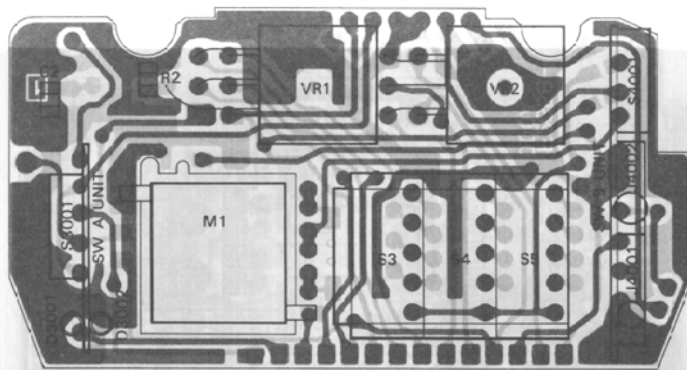
PLL UNIT PARTS LAYOUT
(obverse view of 'chip-only' side)



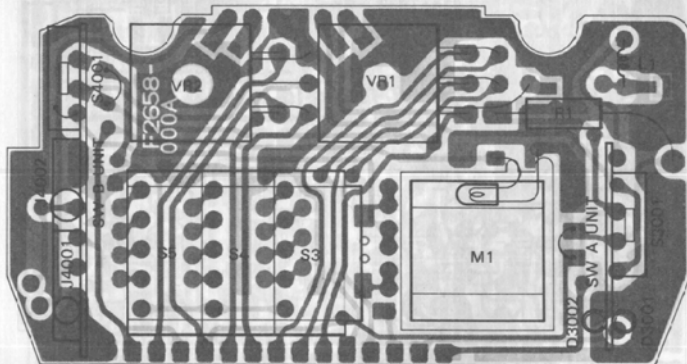
PLL UNIT PARTS LAYOUT
(reverse view of 'mixed component' side)



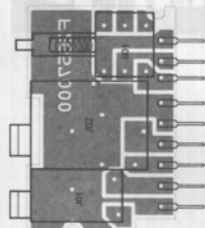
PANEL UNIT ASSEMBLY



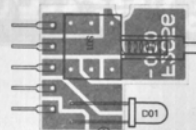
Top view



Bottom view

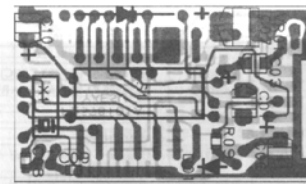


SWITCH B UNIT

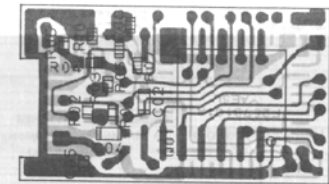


SWITCH A UNIT

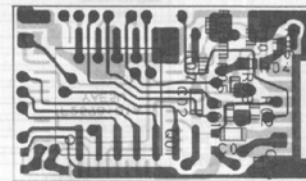
FTS-7



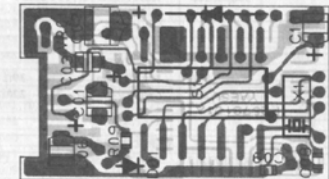
Obverse view of "mixed component" side



Obverse view of "chip-only" side

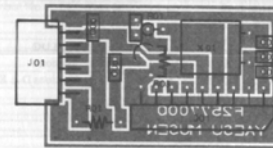


Reverse view of "chip-only" side

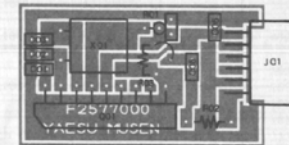


Reverse view of "mixed component" side

FTE-2

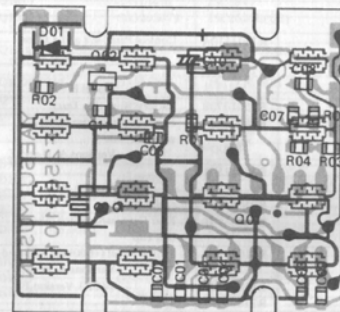


Obverse view

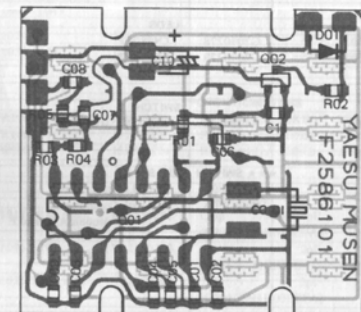


Reverse view

FTT-3



Front view



Rear view

PARTS LIST

MAIN CHASSIS			SWITCH	
Symbol No.	Part No.	Description	S4001	N4090088
*** PANEL BOARD ASSY ***				
	F2658000	Printed Circuit Board PCB with components w/SW (A), (B) UNIT		
			JACKS	
			J4001	P1090369
			J4002	P1090370
			CAPACITORS	
S3,4,5	N7090029	THUMBWHEEL SWITCHES A7MA-146-P2 (Frequency select)	C1	K12171102
			C3,4	K22170805
			POTENTIOMETER	
VR1	J60800104	K09111002-5R1112-5KB 5kΩB (SQL)		
VR2	J60800105	K0911100B-5R1111-20KA 20kΩA (VOL)	MIC1	M3290005
			MICROPHONE	
			RESISTORS	
R1	J20336390	Metallic film 2W 39Ω	SP1	M4090063
R2	J24205221	Chip RMC1/10T 221J 220Ω		
			SPEAKER	
			SWITCHES	
			S1	--
			S2,6,7	N4090040
			S8	--
			ANTENNA JACK	
L1	L0020334		J1	P1090353
			CONNECTION PLUG	
			P1,2,3 (for FTS-7)	T9204880
			P1,2,3 (for FTE-2)	T9204881A
			P8	T9204875C
			P9	T9204876A
			P10-13	T9204882A
			P14-16	T9204899
			P17	T9204900
			P18	T9204959
*** SWITCH UNIT A ***				
	F2656000	Printed Circuit Board PCB with Components		
	C026560A			
			LED'S	
D3001	G2090278	LN38GCP	R3501110A	
D3002	G2090279	LN28RCP	R3501120A	
			SWITCH	
S3001	N4090088	SPJ622N (HI/LOW)	R3501070B	
			R3501140A	
			*** SWITCH UNIT B ***	
	F2657000	Printed Circuit Board PCB with Components Models A, D and E		
	C026570A		R010820A	
			R3800510D	
			R8101970A	
			R8102040A	
			R3107390	

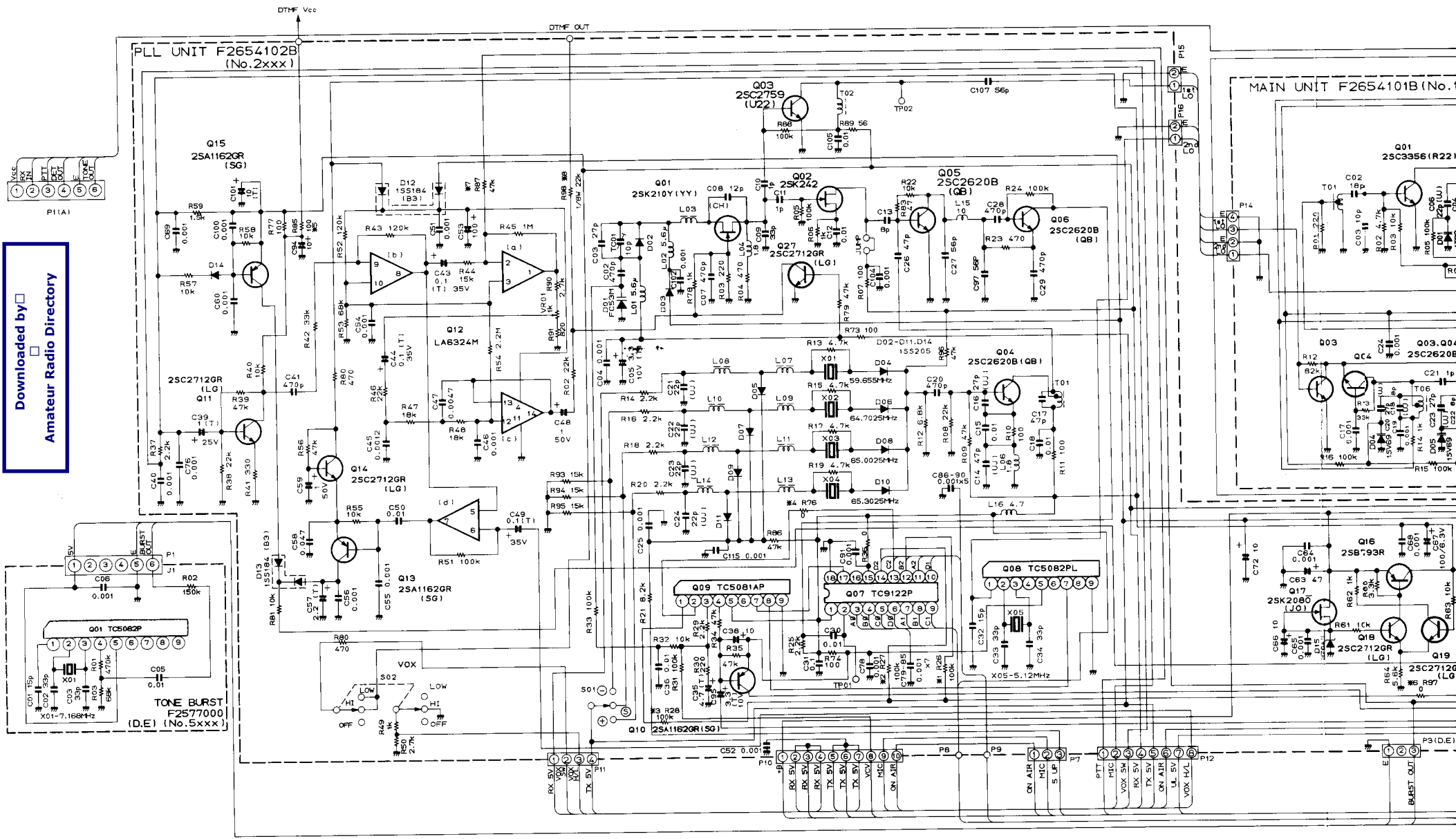
MAIN UNIT			CRYSTAL FILTER SET	
Symbol No.	Part No.	Description		
	R3501040	Left Side Cover (PTT) or (PTT and BURST)	XF1001	H1102081
	R3503640A	Right Side Cover (LAMP)		
	R3503670A	PTT Button Versions A and F (long)		
	R3503660A	" " Versions D and E (short)	CF1001	H3900030
			CERAMIC FILTER	
	R3503650A	BURST Button "		
	R3503680A	LAMP Button "		
	R3503420	UNLOCK Latch Button		
	R0107210A	Spring	CD1001	H7900180
	R0101840A	Belt Clip		
	S6000061	Hand Strap		
	Q9000284	Insulator		
			RESISTORS	
	R3101740	Knob 11TS (VOL and SQL)	R1067,1068,1071-1073	J24205000
	R3101730A	Push Button (LOW, and +5kHz or CALL)	R1031,1058,1066	J24205100
	R3108840	Switch Extender (VOX, or RPT and VOX)	R1059	J24205330
	R6101860	Strap Mounting Screw	R1054	J24205470
	R0101870	Washer	R1046,1065	J24205101
	R6101850	Strap Mounting Dummy Screw	R1069	J24205151
	R0801590B	Frame F	R1062	J24205181
	R0503280B	Frame R	R1001,1056	J24205221
	R0503260A	Panel Frame	R1051	J24205331
	R7102620	Fiber Board	R1060	J24205391
			R1017	J24205471
			R1029	J24205561
			R1044,1052,1053,1055	J24205681
			R1004,1010	J24205821
			R1014,1019,1025	J24205102
			MAIN UNIT	
	F2654101A	Printed Circuit Board	R1021,1023	J24205152
	C026541A	PCB with Component	R1028,1035	J24205222
			R1034	J24205332
			R1002,1008,1011,1026,1032	J24205472
			R1070	J24205562
			R1003,1037	J24205103
			R1038	J24205153
			R1009	J24205183
			R1022,1041	J24205223
			R1013,1039,1045	J24205333
			R1020,1043	J24205473
			R1012	J24205823
			R1005-1007,1015,1016,1018,1047-1049	J24205104
			R1024	J24205274
			R1006,1007,1010,1012	J24205564
			R1030,1033	J24205564
			R1001,1015	J3331207
			R1018	G3309451P
			POTENTIOMETERS	
			VR1002	J51762103
			VR1001	J51762104
			VR1003	J51762224
			DIODES	
	D1006	G2015550	SI	1S1555
	D1017	G2070009	"	1SS184(B3)
	D1012,1013,1018	G2090277	"	1SS205
	D1007,1014	G2090244	Schottky	1SS106
	D1004,1005,1010,1011	G2090109	Varactor	1SV69
	D1001-1003	G2090248	"	1T32
	D1009	G2090227	Zener	HZ9B2L
	D1019	G2090310	Schottky	11DQ04
			CAPACITORS	
			C1011,1021,1065	K22170202
			C1016,1095	K22170203
			C1025,1088,1093	K22170204

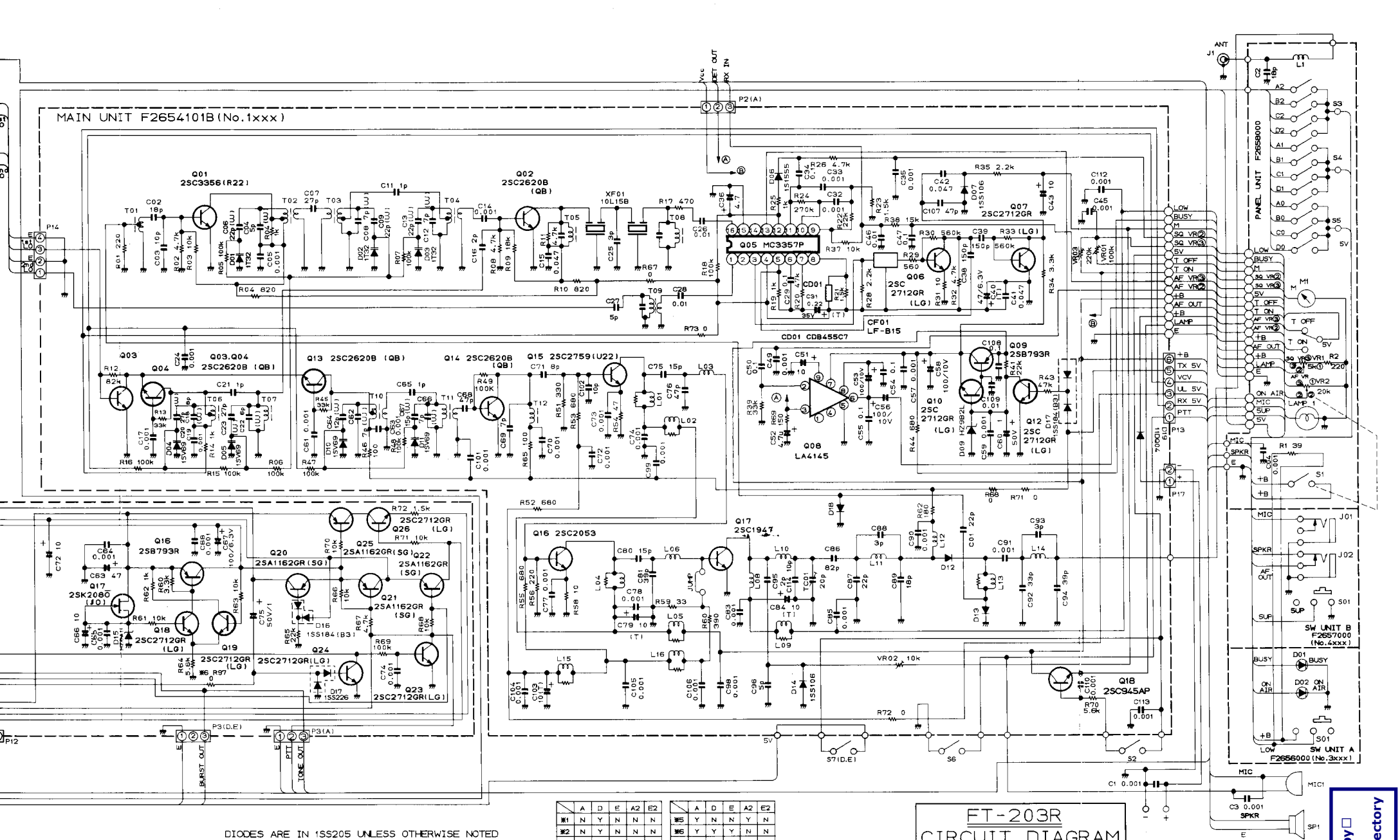
			ACCESSORIES		
Symbol No.	Part No.	Description			
C2058	K22171008	Chip 50WV 0.047µF F (C2012FH473ZFA)			
C2031	K22141904	" 25WV 0.1µF D (C3216D1E104MFA)	Antenna		
C2043,2044,2049	K70167104	Tantalum 35WV 0.1µF (CS15E1V0R1M)	YHA-14A		
C2039,2075	K70140007	" 25WV 1µF (489D105X0025A1)	Ni-Cd Battery Pack*		
C2057	K70127225	" 16WV 2.2µF (CS15E1C2R2M)	D3000315	FNB-3	
			D3000316	FNB-4	
C2005,2095	K70107335	" 10WV 3.3µF (CS15E1A3R3M)	Dry Battery Case*		
C2035	K70120001	" 16WV 4.7µF (489D475X0016B1)	D3000317	FBA-5	
C2101	K70120002	" 16WV 10µF (489D106X0016C1)	Charger for FNB-3*		
C2048,2059	K40179001	Electrolytic 1µF (ECE-A1HK010)	Q9000070	NC-9A 100VAC	
			Q9000071	NC-9B 117VAC	
			Q9000072	NC-9C 220-234VAC	
C2038,2066,2072,2094,2035*	K40129012	" 16WV 10µF (ECE-A1CK100)	Charger for FNB-4*		
C2063	K40129028	" 4µF (ECE-A1CK470)	Charger for FNB-4*		
C2053,2067	K40089007	" 6.3WV 100µF (ECE-A0JK101)	Q9000279	NC-18A 100VAC	
			Q9000280	NC-18B 117VAC	
			Q9000281	NC-18C 220-234VAC	
TRIMMER CAPACITOR					
TC2001	K91000101	ECR-GA010D30 10pF	Carrying Case*		
			D3000325	CSC-6(B) for w/FNB-3 or FBA-5	
			D3000344	CSC-7(B) for w/FNB-4	
			D3000351	CSC-9(B) for w/FNB-3 or FBA-5 & FTT-3	
T2001,2002	L0021418		D3000370	CSC-12(B) for w/FNB-4 & FTT-3	
INDUCTORS					
L2001,2002	L1190111	FL4H-5R6K 5.6µH	* optional same models		
L2002*	L1190013	FL4H-6R8K 6.8µH			
L2004,2006	L1190145	FL3H-1R8M 1.8µH			
L2005	L1020680				
L2015	L1190141	FL3H-100K 10µH			
L2016	L1190110	FL3H-4R7K 4.7µH			
L2003	L0021415		FT2-TONE BURST UNIT (Models D and E)		
L2007,2009,2011	L0021420		Symbol No.	Part No.	Description
L2003*	L0021491			F2577000	Printed Circuit Board
				C025770A	PCH with Components
				C025770B	1750Hz Tone Model
				C025770B	1800Hz Tone Model
CONNECTORS					
J2001	P0090390	3022-07A	IC		
J2002	P0090069	3022-06A			
J2001,2002(F)	P0090092	3022-08A			
			Q5001	G1090239	TC5082P
SWITCHES					
S2001	N6090042	SSS313040	CRYSTALS		
S2002	N6090040	SSS323122			
			X5001	H0101982	HC-18/T 7.168MHz (1750Hz Tone)
			X5001	H0101983	HC-18/T 7.3728MHz (1800Hz Tone)
TERMINAL POST					
		TP-E			
			RESISTORS		
	R0106700B	Shield case	R5003	J00215683	Carbon film 1/8W 68kΩ TJ
	R0106710	Shield cover	R5002	J01215154	" " " 150kΩ TJ
			R5001	J00215474	" " " 470kΩ VJ

* Model F

			CAPACITORS		SWITCH	
Symbol No.	Part No.	Description	Symbol No.	Part No.	Description	
C5001	K00175150	Ceramic disc 50WV 15pF SL (DD104SL150150V)	S1001	N7090030	SGK1072	
C5002,5003	K00175330	" " " 33pF " (DD104SL330150V)	CONNECTOR			
C5006	K12171102	" " " 0.001µF E (DD104E102P50V)				
C5005	K14180103	" " " 63WV 0.01µF FZ (RD871-1FZ103Z63V)	J1001	P0090373	5703-06CPB	
			SIP CONNECTOR		FTT-3 DTMF PANEL UNIT (D3000348)	
JS001	P0090373	5703-06CPB	Symbol No.		Part No.	Description
				F2586100	Printed Circuit Board	
			Q6001	G1090508	IC LR4087	
			Q6002	G3327120G	TRANSISTOR 2SC2712GR	
			FTS-7 TONE ENCODER/DECODER (D3000321)			
			Symbol No.	Part No.	Description	
				F2578101A	Printed Circuit Board	
			D6001	G2090208	LED PR4632K	
			IC		CERAMIC RESONATOR	
Q1001	G1090577	MN6520	CO6001	H7900120	R3.58M	
			DIODES		RESISTORS	
D1001,1002	G2090244	Schottky Barrier 1SS106	R6002	J24205561	Chip RMC-1/10T 5611 560Ω	
			R6003	J24205222	" " " 2221 2.2kΩ	
			R6001	J24205103	" " " 1031 10kΩ	
			R6004,6005	J24205823	" " " 8231 82kΩ	
			CRYSTAL		CAPACITORS	
X1001	H0102571	MS-309 4.194304MHz	C6001,6002	K22170227	Chip 50WV 47pF CH (C2012CH1H470JFA)	
					" " " 0.001µF B	
R1009,1010	J24205102	Chip RMC 1/10T 102J 1kΩ	C6003-6006,6008,6011	K22170805	(C2012B1H102MFA)	
R1002	J24205222	" " " 222J 2.2kΩ	C6007	K22170817	" " " 0.01µF B	
R1006	J24205472	" " " 472J 4.7kΩ			(C2012B1H103MFA)	
R1003,1007,1008	J24205103	" " " 103J 10kΩ	C6008	K22141904	" 25WV 0.1µF D	
R1004,1005	J24205123	" " " 123J 12kΩ			(C3216D1E104MFA)	
R1001	J24205104	" " " 104J 100kΩ	C6010	K40129012	Electrolytic 16WV 10µF (ECE-A1CK100)	
			POTENTIOMETER			
VR1001	J51750473	H0423A047-47KB 47kΩB		N5090020	KEYPAD SM-725	
			CAPACITOR		MICROPHONE	
C1008,1009	K22170217	Chip Ceramic 50WV 18pF CH (C2012CH1H180JFA)	MIC1	M3290005	EM-78C	
C1005	K22171004	" " " 0.01µF F (C2012FH1H03ZFA)	SP1	N4090063	SPEAKER CO35A13	
C1002,1004	K22141904	" " 25WV 0.1µF D (C3216D1E104MFA)			Panel	
C1003	K72080002	Chip Tantalum 6.3WV 4.7µF (F950J475MA1)			Trim band	
C1001,1006	K72080003	" " " 10µF (F950J106MCI)			Speaker net	
C1007	K72060007	" " 4WV 100µF (F950G107MH1)				

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DIODES ARE IN 1SS205 UNLESS OTHERWISE NOTED

	A	D	R	A2	E2
#1	N	N	N	N	N
#2	Y	Y	Y	N	N
#3	Y	Y	Y	N	N
#4	Y	Y	Y	N	N
#5	A	D	R <td>A2</td> <td>E2</td>	A2	E2
#6	Y	Y	Y	N	N
#7	Y	Y	Y	N	N
#8	N	N	N	N	N

FT-203R
CIRCUIT DIAGRAM