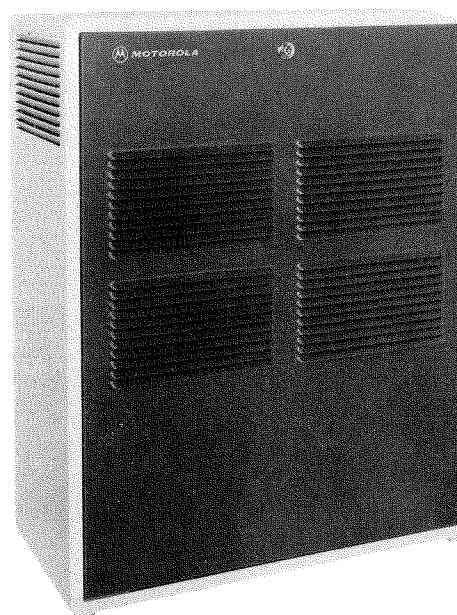




MOTOROLA

MSF 5000™ BASE STATION and REPEATER

**403-470 MHz
Continuous Duty**



Instruction Manual

68P81062E75-B

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EPS-34440-B

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In order to obtain performance of this warranty, purchaser must contact its Motorola salesperson or Motorola at the address first above shown, attention Quality Assurance Department.

This warranty applies only within the United States.

EPS-30831-O

CLASS A COMPUTING DEVICE COMPLIANCE STATEMENT

WARNING

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

EPS-37978-O



**MSF 5000 BASE STATION
AND REPEATER**
403-470 MHz
CONTINUOUS DUTY

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PERFORMANCE SPECIFICATIONS

GENERAL

Number of Channels	One, two and four channel base and repeater (RT) stations (DC or Tone Remote Control).					
Squelch Options	<i>Private-Line</i> and <i>Digital Private-Line</i> coded squelch are standard and available within the same radio. Carrier squelch and multiple coded squelch are optional.					
Metering	Metering sockets are provided on each major assembly to facilitate station testing and alignment.					
Input Voltage	96-132 V ac, 60 Hz (standard); emergency revert/battery charger (optional); and 13.8 to 16.3 V dc only input (optional).					
Dimensions	26.5" H × 21" W × 10" D (67cm H × 53cm W × 25cm D)					
Weight	Approximately 148 lbs. (67kg). Shipping weight approximately 160 lbs. (73kg).					
Model	Frequency (MHz)	RF Power Output	Input Power (varies with options)			
			Line		13.6 V DC Negative Ground	
			Standby	Transmit	Standby	Transmit
C74CLB	403-435 435-470 (435-475 Optional)	110 W Variable to 75 W	75 W	550 W	25 W	425 W

TRANSMITTER: CONTINUOUS DUTY OPERATION

	Standard	With C597 Option	With C598 Option	With C675 Option	With C677 Option
Transmit Bandwidth	6.1 MHz	0.5 MHz	0.5 MHz	1 MHz	1 MHz
<u>Antenna Connectors</u>					
Base Station	Antenna Switch: Type-UHF	—	—	—	—
Repeater Station	Xmtr: Type-N Rcvr: Type-N	— —	— —	— —	— —
Incabinet Duplexer Filtering	—	Type-N	Type-N	Type-N	Type-N
Output Impedance	50 ohms	50 ohms	50 ohms	50 ohms	50 ohms
Frequency Stability	± .0002 of assigned center frequency from -30°C to +60°C ambient (+25°C reference)				
Transmitter Sideband Noise	Standard	With C597 Option		With C675 Option	
	-100 dBc @ ±25 kHz -110 dBc @ ±1 MHz	-100 dBc @ ±25 kHz -180 dBc @ ±3 MHz		-100 dBc @ ±25 kHz -180 dBc @ ±5 MHz	
	Standard	With *C597, C676, or **C677 Option			
Transmitter Intermodulation	-30 dBc @ ±25 kHz	-70 dBc @ ±25 kHz * Post Transmitter Selectivity: -40 dB @ ±3 MHz ** Post Transmitter Selectivity: -40 dB @ ±5 MHz			
Modulation	15F2 & 16F3: ±5 kHz for 100% @ 1000 Hz				
Audio Sensitivity	Remote Telephone Line: Adjustable from -35 to + dBm max. for 60% deviation @ 1000 Hz Local Audio: 0.120 volt ±3 dB for 60% max. deviation @ 1000 Hz				
FM Hum & Noise	-60 dB CEPT -55 dB EIA 300-3000 Hz modulation bandwidth				
Audio Response	+1, -3 dB from 6 dB/octave pre-emphasis, 300-3000 Hz, referenced to 1000 Hz with 6 dB/octave de-emphasis from 2500-3000 Hz				
Audio Distortion	Less than 2% @ 1000 Hz; 60% system deviation				
Authorized Emission	15F2, 16F3 and 16F9 emission				
Radiated Spurious Emissions	0.25 uW CEPT (30 MHz-2 GHz)				
FCC Designation	ABZ89FC4631				

PERFORMANCE SPECIFICATIONS (Cont'd.)

RECEIVER: HALF OR FULL DUPLEX OPERATION

Channel Spacing	25 kHz	
Receive Bandwidth	2 MHz	
Modulation Acceptance	± 7 kHz minimum	
Frequency Stability	$\pm .0002\%$ of assigned center frequency from -30°C to $+60^{\circ}\text{C}$ ambient ($+25^{\circ}\text{C}$ reference)	
EIA Sensitivity: 20 dB quieting 12 dB SINAD	Standard	With C598 or C677 Option
	0.5 μV 0.35 μV	0.5 μV 0.35 μV
EIA Adjacent Channel Selectivity and Desensitization: ± 25 kHz greater than ± 0.5 MHz	100 dB 115 dB	100 dB 115 dB
EIA Intermodulation Immunity	90 dB	90 dB
EIA Spurious and Response Immunity	110 dB	100 dB
Squelch Sensitivity: Carrier Squelch (adjustable) Tone Coded Squelch (fixed) Digital Coded Squelch	0.25 μV or less at threshold 0.25 μV or less 0.25 μV or less	0.25 μV or less at threshold 0.25 μV or less 0.25 μV or less
Audio Characteristics Output Response Distortion Hum & Noise	Remote Telephone Line: +11 dBm max. (600 ohms) for 60% maximum deviation @ 1000 Hz +1, -3 dB from 6 dB/octave de-emphasis, 300-3000 Hz, referenced to 1000 Hz 3% @ 1000 Hz -55 dB	
Local Speaker: Output Available Response Distortion Hum & Noise	1/2 Watt @ 3.2 ohms +1, -8 dB from 6 dB/octave de-emphasis 300-3000 Hz, referenced to 1000 Hz 3% @ 1000 Hz -55 dB	
RF Input Impedance	Nominal 50 ohms	
Radiated Spurious Emissions	2 nW CEPT (30 MHz-2 GHz)	
Conducted Spurious Emissions	2 nW CEPT (100 kHz-2 GHz)	
FCC Designation	ABZ89FR4632	

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

C 7 4 C L B 7 I O 6 A T

T = RT REPEATER

5 = DC REMOTE CONTROL

6 = TONE REMOTE CONTROL

MICROPROCESSOR CONTROLLED OPERATION

2 = ISOLATION NETWORK

3 = 15W RF OUTPUT

4 = 40W RF OUTPUT

6 = 75W RF OUTPUT

7 = 110W RF OUTPUT

● = 1 ITEM SUPPLIED
2 = 2 ITEM SUPPLIED
3 = 3 ITEM SUPPLIED

STATION NO.	CONTROL TYPE	RF POWER OUTPUT (WATTS)
C224CLB-7105A	DC	6W
C284CLB-7106A	TONE	6W
C334CLB-7105A	DC	15W
C334CLB-7106A	TONE	15W
C444CLB-7105A	DC	40W
C444CLB-7106A	TONE	40W
C664CLB-7105A	DC	75W
C664CLB-7106A	TONE	75W
C74CLB-7105A	DC	110W
C74CLB-7106A	TONE	110W
C224CLB-7105AT	DC	6W
C224CLB-7106AT	TONE	6W
C334CLB-7105AT	DC	15W
C334CLB-7106AT	TONE	15W
C444CLB-7105AT	DC	40W
C444CLB-7106AT	TONE	40W
C664CLB-7105AT	DC	75W
C664CLB-7106AT	TONE	75W
C74CLB-7105AT	DC	110W
C74CLB-7106AT	TONE	110W

DEPS-37886-B

MODEL BREAKDOWN
CHART FOR
MSF 5000
CONTINUOUS DUTY
BASE AND REPEATER (RT) STATIONS
403-470MHZ

CODE :
● = ONE ITEM SUPPLIED
2,3,4 = SUPPLIED QUANTITY

MODEL NO.	DESCRIPTION
TLN2423A	STATION CONTROL MODULE
TLN2490A	JUNCTION BOX W/CONVENIENCE OUTLET
TLN2640A	JUNCTION BOX W/O CONVENIENCE OUTLET
TPNI186A	500W POWER SUPPLY
TPNI217A	250W POWER SUPPLY
TTEI451A	110W PA DECK (SINGLE CIRCULATOR): 403-435MHZ
TTEI452A	110W PA DECK (SINGLE CIRCULATOR): 435-475MHZ
TTEI502A	75W PA DECK (SINGLE CIRCULATOR): 435-475MHZ
TTEI522A	40W PA DECK (SINGLE CIRCULATOR): 435-475MHZ
TTEI542A	15W PA DECK (SINGLE CIRCULATOR): 435-475MHZ
TTEI592A	ISOLATION NETWORK (SINGLE CIRCULATOR): 435-475MHZ
TUEI761A	RF TRAY: 403-435MHZ
TUEI762A	RF TRAY: 435-475MHZ

MODEL NO.	DESCRIPTION
TTE6481A	INJECTION FILTER (403-435MHZ)
TTE6482A	INJECTION FILTER (435-475MHZ)
TFN6045A	PL HYBRID FILTER
TKN8306A	POWER AMPLIFIER CABLE
TKN8442A	SINGLE CIRCULATOR CABLE KIT
TKN8483A	POWER AMPLIFIER CABLE
TKN8486A	POWER AMPLIFIER CABLE
TKN8842A	IPA FEEDTHRU CABLE
TKN8953A	POWER AMPLIFIER CABLE
TKN9800A	ISOLATION NETWORK CABLE
TLE2231A	INTERMEDIATE POWER AMPLIFIER (403-435MHZ)
INCLUDES :	TKN8843A IPA OUTPUT CABLE
	TLE5331A IPA HYBRID CIRCUIT (403-435MHZ)
	TRN5146A IPA HARDWARE KIT
	TRN9667A IPA CARRIER BOARD
TLE2232A	INTERMEDIATE POWER AMPLIFIER (435-475MHZ)
INCLUDES :	TKN8843A IPA OUTPUT CABLE
	TLE5332A IPA HYBRID CIRCUIT (435-475MHZ)
	TRN5145A IPA CARRIER BOARD
	TRN5146A IPA HARDWARE KIT
TLE5321A	INJECTION AMPLIFIER BOARD (403-435MHZ)
TLE5322A	INJECTION AMPLIFIER BOARD (435-475MHZ)
TLE5391A	PRESELECTOR (403-435MHZ)
TLE5392A	PRESELECTOR (435-475MHZ)
TLE5401A	FRONT END (403-435MHZ)
TLE5402A/B	FRONT END (435-475MHZ)
TLE5411A	POWER AMPLIFIER MODULE (403-435MHZ): DRIVER AND FINALS
TLE5412A	POWER AMPLIFIER MODULE (435-475MHZ): DRIVER AND FINALS
TLE5421A	POWER AMPLIFIER MODULE (403-435MHZ): PRE-DRIVER
TLE5422A/B	POWER AMPLIFIER MODULE (435-475MHZ): PRE-DRIVER
TLE5431A	POWER SPLITTER (403-435MHZ)
TLE5432A	POWER SPLITTER (435-475MHZ)
TLE5441A	POWER COMBINER (403-435MHZ)
TLE5442A	POWER COMBINER (435-475MHZ)
TLE5582A	DIRECTIONAL COUPLER
TLE5642A	POWER SPLITTER (435-475MHZ)
TLE5652A	POWER COMBINER (435-475MHZ)
TPN6138B	POWER SUPPLY DISTRIBUTION BOARD
TREI321A	RECEIVE VCO (403-435MHZ)
INCLUDES :	TLE5381A RECEIVE VCO HARDWARE KIT (403-435MHZ)
	TRE6101A RECEIVE VCO BOARD (403-435MHZ)
TREI322A	RECEIVE VCO (435-475MHZ)
INCLUDES :	TLE5382A RECEIVE VCO HARDWARE KIT (435-475MHZ)
	TRN6102A RECEIVE VCO BOARD (435-475MHZ)
TRN4372A	ANALOG-TO-DIGITAL HYBRID
TRN5142A	RF TRAY HARDWARE KIT
TRN5159A	LINE INTERFACE BOARD
TRN5195A	PL/DPL STATION CONTROL BOARD
TRN5196A	PL/DPL STATION CONTROL PROGRAM EPROM (EARLY VERSION)
TRN5204A	POWER AMPLIFIER DISTRIBUTION BOARD
TRN5205A	POWER AMPLIFIER FEEDTHRU PLATE KIT
TRN5206A	POWER AMPLIFIER HARDWARE KIT
TRN5207A	BALANCING RESISTOR KIT
TRN5336A	500W POWER SUPPLY HARDWARE KIT
TRN5362A	RF TRAY INTERCONNECT BOARD
TRN5452A	POWER SUPPLY MISCELLANEOUS HARDWARE KIT
TRN5471A	INTERCONNECT HOUSING W/CONVENIENCE OUTLET
TRN5859A	INTERCONNECT HOUSING W/O CONVENIENCE OUTLET
TRN5930A	INPUT BALANCING RESISTOR KIT
TRN5931A	OUTPUT BALANCING RESISTOR KIT
TRN5932A	POWER AMPLIFIER HARDWARE KIT
TRN5933A	POWER AMPLIFIER HARDWARE KIT
TRN5934A	POWER AMPLIFIER HARDWARE KIT
TRN5936A	POWER AMPLIFIER DISTRIBUTION BOARD
TRN5963A	POWER SUPPLY MISCELLANEOUS HARDWARE KIT
TRN5968A	250W POWER SUPPLY HARDWARE KIT
TRN9066A	ISOLATION NETWORK DISTRIBUTION BOARD
TRN9067A	ISOLATION NETWORK DISTRIBUTION BOARD
TRN9261A	PL/DPL STATION CONTROL PROGRAM EPROM (LATER VERSION)
TRN9670A	PA HARDWARE KIT
TRN9880A	UNIBOARD
TTEI432A	SINGLE CIRCULATOR (435-475MHZ)
TTEI471A	TRANSMIT VCO (403-435MHZ)
INCLUDES :	TLE5371A TRANSMIT VCO HARDWARE KIT (403-435MHZ)
	TTE6111A TRANSMIT VCO BOARD (403-435MHZ)
TTEI472A	TRANSMIT VCO (435-475MHZ)
INCLUDES :	TLE5372A TRANSMIT VCO HARDWARE KIT (435-475MHZ)
	TTE6112A TRANSMIT VCO BOARD (435-475MHZ)
TTEI562A	SINGLE CIRCULATOR (435-475MHZ)
TTE6211A	SINGLE SMALL CIRCULATOR (403-435MHZ)

OPTION CHART

Option	Add	Delete	Description
*C13	—	—	Remote Squelch Setting
*C14	—	—	Receive PL On/Off
C28AP	TKN8295A TPN1185A TRN5155A	TPN1186A	500 W, 60 Hz Battery Charger Power Supply
C28AR	TKN8295A TLN2640A TPN1201A TRN5155A TRN5969A	TLN2490A TPN1186A TRN5461A	500 W, 50 Hz Battery Charger Power Supply
C28AS	TKN8295A TLN2640A TPN1202A TRN5155A TRN5970A	TLN2490A TPN1186A TRN5461A	120/220 V, 500 W, 60 Hz Battery Charger Power Supply
C28AW	TKN8295A TRN5155A TRN1215A	TPN1214A	120/220 V, 250 W, 50 Hz Battery Charger Power Supply
C28AX	TKN8295A TRN5155A TPN1218A	TPN1217A	120/220 V, 250 W, 60 Hz Battery Charger Power Supply
C32AJ	TKN8845A TPN1198A TRN5155A	TPN1186A	High Power DC Only Input Filter
C32AL	TKN8845A TKN8901A TPN1209A TRN5643A	TPN1217A	Low Power DC Only Input Filter
*C63	—	—	Transmit PL On/Off
*C66	—	—	4-Channel Station Operation
C84AD	TRN5200A	TKN8305A TLN2421A TRN5189A TRN5190A	Tone Remote Control Omit Wireline
*C86AD	TRN5200A	TKN8305A TRN5193A	DC Remote Control Omit Wireline
C99	—	—	Reduced Power Output
C144AM	TRN5192A	TRN5191A	DC 4-Wire Remote Control
C144AN	TLN2422A	TLN2421A	Tone 4-Wire Remote Control
*C170	—	—	Guard Tone Keying Only
C257AB	TLN2640A TPN1199A TRN5969A	TLN2490A TPN1186A TRN5461A	500 W, 50 Hz Power Supply
*C268	—	—	Delete Coded Squelch
C323AA	—	TRN5427A	Omit Line Cord
*C332AA	TRN5192A	TRN5191A	DC Remote Full Duplex 4-Wire Audio
*C332AB	TLN2422A	TLN2421A	Tone Remote Full Duplex 4-Wire Audio
*C345	—	—	Add Automatic Station Identification
*C395	—	—	Variable Time-Out Timer
*C578	—	—	Over-the-Air Remote Alarm Reporting
C597AA	**TFE6561A TLE5721A TRN5352A TRN5580A TUE1901A	TFE6502A TKN8314A TRN5156A TUE1760A Series	Repeater Station Transmitter Filtering (Normally Used for Incabinet Duplexer Operation); T below R, 403-435 MHz Only, with a T/R Separation of 3 to 20 MHz.
C597AB	**TFE6561A TLE5721A TRN5580A TUE1901A	TFE6502A TRN5157A TRN5208A TUE1760A Series	Base Station Transmitter Filtering (Normally Used for Incabinet Duplexer Operation); T below R, 403-435 MHz Only, with a T/R Separation of 3 to 20 MHz.

OPTION CHART (Cont'd.)

Option	Add	Delete	Description
C598AA	**TFE6561A TLE5721A TRN5352A TRN5580A TTE1460A Series TUE1901A	TFE6502A TKN8314A TRN5156A TTE1450A Series TUE1760A Series	Repeater Station Transmitter Filtering (Normally Used for Incabinet Duplexer Operation) & Triple-Stage Circulator 110 W Power Amplifier Deck; T below R, 403-435 MHz Only, with a T/R Separation of 3 to 20 MHz.
C598AB	**TFE6561A TLE5721A TRN5580A TTE1460A Series TUE1901A	TFE6502A TRN5208A TRN5157A TTE1450A Series TUE1760A Series	Base Station Transmitter Filtering (Normally Used for Incabinet Duplexer Operation) & Triple-Stage Circulator 110 W Power Amplifier Deck; T below R, 403-435 MHz Only, with a T/R Separation of 3 to 20 MHz.
*C600	—	—	8-Channel Station Operation
C649AA	TPN1214A TRN5974A	TPN1217A TRN5973A	250 W, 50 Hz Power Supply
C658AA	TLE5770A Series	TLE5730A Series	Duplexer TEE Used at T above R, with a T/R Separation of 5 to 20 MHz; 403-475 MHz.
C658AB	TLE5781A	TLE5721A	Duplexer TEE Used at T above R, with a T/R Separation of 3 to 20 MHz; 403-435 MHz Only.
*C669	—	—	Delete Station Alarm Reporting
*C670	—	—	Phone Line Loop Test
*C671	—	—	Variable Repeater Drop-Out Delay
*C672	—	—	Variable PTT Priority
*C673	—	—	Variable Repeater Control
*C674	—	—	Variable Receiver Audio Control
C675AA	**TFE6490A Series TLE5730A Series TRN5352A TRN5580A	TFE6502A TKN8314A TRN5156A	Repeater Station Transmitter Filtering (Normally Used for Incabinet Duplexer Operation); T below R, 403-475 MHz, with a T/R Separation of 5 to 20 MHz.
C675AB	**TFE6490A Series TLE5730A Series TRN5580A	TFE6502A TRN5157A TRN5208A	Base Station Transmitter Filtering (Normally Used for Incabinet Duplexer Operation); T below R, 403-475 MHz, with a T/R Separation of 5 to 20 MHz.
C676AA	TTE1460A Series	TTE1450A Series	Triple-Stage Circulator 110 W Power Amplifier Deck; 403-475 MHz.
C676AC	TTE1512A	TTE1502A	Triple-Stage Circulator 75 W Power Amplifier Deck; 435-475 MHz.
C676AD	TTE1532A	TTE1522A	Triple-Stage Circulator 40 W Power Amplifier Deck; 435-475 MHz.
C676AE	TTE1552A	TTE1592A	Triple-Stage Circulator 15 W Power Amplifier Deck; 435-475 MHz.
C676AF	TTE1602A	TTE1592A	Triple-Stage Circulator Isolation Network; 435-475 MHz.
C677AA	**TFE6490A Series TLE5730A Series TRN5352A TRN5580A TTE1460A Series	TFE6502A TKN8314A TRN5156A TTE1450A Series	Repeater Station Transmitter Filtering (Normally Used for Incabinet Duplexer Operation) & Triple-Stage Circulator 110 W Power Amplifier Deck; T below R, 403-475 MHz, with a T/R Separation of 5 to 20 MHz.
C677AB	**TFE6490A Series TLE5730A Series TRN5580A TTE1460A Series	TFE6502A TRN5157A TRN5208A TTE1450A Series	Base Station Transmitter Filtering (Normally Used for Incabinet Duplexer Operation) & Triple-Stage Circulator 110 W Power Amplifier Deck; T below R, 403-475 MHz, with a T/R Separation of 5 to 20 MHz.
C677AD	**TFE6492A TLE5732A TRN5580A TTE1512A	TFE6502A TRN5157A TRN5208A TTE1502A	Base Station Transmitter Filtering (Normally Used for Incabinet Duplexer Operation) & Triple-Stage Circulator 75 W Power Amplifier Deck; T below R, 435-475 MHz, with a T/R Separation of 5 to 20 MHz.
C677AE	**TFE6492A TLE5732A TRN5352A TRN5580A TTE1512A	TFE6502A TKN8314A TRN5156A TTE1502A	Repeater Station Transmitter Filtering (Normally Used for Incabinet Duplexer Operation) & Triple-Stage Circulator 75 W Power Amplifier Deck; T below R, 435-475 MHz, with a T/R Separation of 5 to 20 MHz.
C677AF	**TFE6492A TLE5732A TRN5580A TTE1532A	TFE6502A TRN5157A TRN5208A TTE1522A	Base Station Transmitter Filtering (Normally Used for Incabinet Duplexer Operation) & Triple-Stage Circulator 40 W Power Amplifier Deck; T below R, 435-475 MHz, with a T/R Separation of 5 to 20 MHz.
C677AG	**TFE6492A TLE5732A TRN5352A TRN5580A TTE1532A	TFE6502A TKN8314A TRN5156A TTE1522A	Repeater Station Transmitter Filtering (Normally Used for Incabinet Duplexer Operation) & Triple-Stage Circulator 40 W Power Amplifier Deck; T below R, 435-475 MHz, with a T/R Separation of 5 to 20 MHz.

OPTION CHART (Cont'd.)

Option	Add	Delete	Description
C677AH	**TFE6492A TLE5732A TRN5580A TTE1552A	TFE6502A TRN5157A TRN5208A TTE1542A	Base Station Transmitter Filtering (Normally Used for Incabinet Duplexer Operation) & Triple-Stage Circulator Power 15 W Amplifier Deck; T below R, 435-475 MHz, with a T/R Separation of 5 to 20 MHz.
C677AJ	**TFE6492A TLE5732A TRN5352A TRN5580A TTE1552A	TFE6502A TKN8314A TRN5156A TRN1542A	Repeater Station Transmitter Filtering (Normally Used for Incabinet Duplexer Operation) & Triple-Stage Circulator 15 W Power Amplifier Deck; T below R, 435-475 MHz, with a T/R Separation of 5 to 20 MHz.
C677AK	**TFE6492A TLE5732A TRN5580A TTE1602A	TFE6502A TRN5157A TRN5208A TTE1592A	Base Station Transmitter Filtering (Normally Used for Incabinet Duplexer Operation) & Triple-Stage Circulator Isolation Network; T below R, 435-475 MHz, with a T/R Separation of 5 to 20 MHz.
C677AL	**TFE6492A TLE5732A TRN5352A TRN5580A TTE1602A	TFE6502A TKN8314A TRN5156A TRN1592A	Repeater Station Transmitter Filtering (Normally Used for Incabinet Duplexer Operation) & Triple-Stage Circulator Isolation Network; T below R, 435-475 MHz, with a T/R Separation of 5 to 20 Mhz.
*C678	—	—	Multiple-Input Transmit Control
*C679	—	—	2-Channel Station Operation
*C680	—	—	8-Channel Station Operation
C681AA	TLN2640A TLN2640A TPN1200A TRN5970A	TLN2490A TPN1186A TRN5461A	500 W, 60 Hz Power Supply
*C682	—	TRN5208A	Omit Antenna Relay
*C683	—	—	Expanded Remote Control
C691AA	TRN5972A	TRN5427A	European Line Cord
C692AA	TRN5971A	TRN5427A	United Kingdom Line Cord
TLN2566	—	—	Field Installed Battery Charger Conversion Kit
TRN5190A	—	—	Tone Remote Control Code Plug
TRN5194	—	—	Station Control Code Plug Kit
TRN5757	—	—	Station Stacking Hardware Kit

* Firmware (Code Plug Programming) change required.

** Order from factory only.

OPTION ITEM BREAKDOWN CHARTS FOR *MSF 5000* STATIONS

MSF 5000
POWER AMPLIFIER DECKS
403-470MHZ

DESCRIPTION

110W PA DECK: 435-475MHZ

75W PA DECK: 435-475MHZ

40W PA DECK: 435-475MHZ

15W PA DECK: 435-475MHZ

ISOLATION NETWORK: 435-475MHZ

MODEL NO.

TT31462A

TTE1512A

TTE1532A

TTE1552A

TTE1602A

CODE :

● = ONE ITEM SUPPLIED

2,3,4 = QUANTITY SUPPLIED

* * = ORDER FROM FACTORY ONLY

MODEL NO.	DESCRIPTION
TKN8306A	POWER AMPLIFIER CABLE
TKN8443A	TRIPLE CIRCULATOR CABLE KIT
TKN8483A	POWER AMPLIFIER CABLE
TKN8486A	POWER AMPLIFIER CABLE
TKN8980A	POWER AMPLIFIER CABLES
TLE5411A	POWER AMPLIFIER MODULE (403-435MHZ): DRIVER AND FINALS
TLE5412A	POWER AMPLIFIER MODULE (435-470MHZ): DRIVER AND FINALS
TLE5421A	POWER AMPLIFIER MODULE (403-435MHZ): PRE-DRIVER
TLE5422A/B	POWER AMPLIFIER MODULE (435-470MHZ): PRE-DRIVER
TLE5431A	POWER SPLITTER (403-435MHZ)
TLE5432A	POWER SPLITTER (435-470MHZ)
TLE5441A	POWER COMBINER (403-435MHZ)
TLE5442A	POWER COMBINER (435-470MHZ)
TLE5582A	DIRECTIONAL COUPLER
TLE5642A	POWER SPLITTER (435-470MHZ)
TLE5652A	POWER COMBINER (435-470MHZ)
TRN5204A	POWER AMPLIFIER DISTRIBUTION BOARD
TRN5205A	POWER AMPLIFIER FEEDTHRU PLATE KIT
TRN5206A	POWER AMPLIFIER HARDWARE KIT
TRN5207A	BALANCING RESISTOR KIT
TRN5930A	INPUT BALANCING RESISTOR KIT
TRN5931A	OUTPUT BALANCING RESISTOR KIT
TRN5932A	POWER AMPLIFIER HARDWARE KIT
TRN5933A	POWER AMPLIFIER HARDWARE KIT
TRN5934A	POWER AMPLIFIER HARDWARE KIT
TRN5936A	POWER AMPLIFIER DISTRIBUTION BOARD
TRN9066A	ISOLATION NETWORK DISTRIBUTION BOARD
TRN9067A	ISOLATION NETWORK HARDWARE KIT
* * TTE1442A	TRIPLE CIRCULATOR (435-470MHZ)
* * TTE1572A	TRIPLE CIRCULATOR (435-470MHZ)
* * TTE6211A	SINGLE SMALL CIRCULATOR (403-435MHZ)
* * TTE6221A	SINGLE LARGE CIRCULATOR (403-435MHZ)

CEPS-40207-A

ITEM	DESCRIPTION
TPN185A	500W, 60HZ BATTERY CHARGER POWER SUPPLY
TPN196A	HIGH POWER DC ONLY INPUT FILTER
TPN199A	120/220V, 250W, 50HZ POWER SUPPLY
TPN200A	120/220V, 500W, 60HZ POWER SUPPLY
TPN209A	LOW POWER DC ONLY INPUT FILTER
TPN214A	120/220V, 250W, 50HZ POWER SUPPLY
TPN217A	120/220V, 250W, 60HZ POWER SUPPLY
TPN218A	120/220V, 250W, 60HZ BATTERY CHARGER POWER SUPPLY

MSF 5000

POWER SUPPLIES

CODE:

● = ONE ITEM SUPPLIED

ITEM	DESCRIPTION
TPN6137C	BATTERY CHARGER BOARD
TPN6138B	DISTRIBUTION BOARD
TRN5153A	BATTERY CHARGER HARDWARE KIT
TRN5336A	POWER SUPPLY HARDWARE KIT
TRN5452A	MISCELLANEOUS HARDWARE KIT
TRN5611A	HARDWARE KIT
TRN5620A	500W, 50HZ HARDWARE KIT
TRN5621A	500W, 60HZ HARDWARE KIT
TRN5622A	DISTRIBUTION BOARD
TRN5789A	POWER SUPPLY HARDWARE KIT
TPN5963A	MISCELLANEOUS HARDWARE KIT
TRN5964A	250W, 50HZ HARDWARE KIT
TRN5965A	250W, 60HZ HARDWARE KIT
TRN5968A	250W, 60HZ HARDWARE KIT
TRN9752A	HARDWARE KIT

CEPS-40206-A

TUE1901A RF Tray (T/R = 3-20 MHz); 403-435 MHz
TFE6481A Injection Filter; 403-435 MHz
TKN8842A IPA Feedthru Cable
TLE2231A Intermediate Power Amplifier; 403-435 MHz
TKN8843A IPA Output Cable
TLE5331A IPA Hybrid Circuit; 403-435 MHz
TRN5146A IPA Hardware Kit
TRN9667A IPA Carrier Board
TLE5321A Injection Amplifier Board; 403-435 MHz
TLE5701A Front End (T/R = 3-20 MHz); 403-435 MHz
TLE5711A Preselector (T/R = 3-20 MHz); 403-435 MHz
TRE1321A Receive VCO; 403-435 MHz
TLE5381A Receive VCO Hardware Kit; 403-435 MHz
TRE6101A Receive VCO Board; 403-435 MHz
TRN5142A RF Tray Hardware Kit
TRN5382A RF Tray Interconnect Board
TRN9880A Uniboard
TTE1471A Transmit VCO; 403-435 MHz
TLE5371A Transmit VCO Hardware Kit; 403-435 MHz
TTE6111A Transmit VCO Board; 403-435 MHz
TLN2422A 4-Wire Tone Remote Control Module
TRN5186A Tone Remote Control Program EPROM
TRN5187A 4-Wire Tone Remote Control Board

[illegible]

MSF 5000
POWER AMPLIFIER DECKS
403-470MHZ

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TRN5933A	POWER AMPLIFIER HARDWARE KIT
TRN5934A	POWER AMPLIFIER HARDWARE KIT
TRN5936A	POWER AMPLIFIER DISTRIBUTION BOARD
TRN9066A	ISOLATION NETWORK DISTRIBUTION BOARD
TRN9067A	ISOLATION NETWORK HARDWARE KIT
* * TTE1442A	TRIPLE CIRCULATOR (435-470MHZ)
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* * TTE621A	SINGLE SMALL CIRCULATOR (403-435MHZ)
* * TTE622A	SINGLE LARGE CIRCULATOR (403-435MHZ)

CEPS-40207-A

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FOREWORD

1. SCOPE OF MANUAL

This manual is intended for use by experienced technicians familiar with similar types of equipment. It contains all service information required for the equipment described and is current as of the printing date. Changes which occur after the printing date are incorporated by Instruction Manual Revisions (SMR). These SMR's are added to the manuals as the engineering changes are incorporated into the equipment.

2. MODEL AND KIT IDENTIFICATION

Motorola equipments are specifically identified by an overall model number on the nameplate. In most cases, assemblies and kits which make up the equipment also have kit model numbers stamped on them. When a production or engineering change is incorporated, the applicable schematic diagrams are updated.

3. SERVICE

Motorola's National Service Organization offers one of the finest nation-wide installation and maintenance programs available to communication equipment users. This organization includes approximately 900 autho-

rized Motorola Service Stations (MSS) located throughout the United States, each manned by one or more trained, FCC licensed technicians.

These MSS's are independently owned and operated and were selected by Motorola to service its customers. Motorola maintenance is available on either a time and material basis or on a periodic fixed-fee type arrangement.

The administrative staff of this organization consists of national, area and district service managers and district representatives, all of whom are Motorola employees with the objective to improve the service to our customers.

Should you wish to purchase a service contract for your Motorola equipment, contact your Motorola Service Representative, or write to:

National Service Manager
Motorola Communications and Electronics, Inc.
1303 E. Algonquin Road
Schaumburg, Illinois 60196

REPLACEMENT PARTS ORDERING

ORDERING INFORMATION

Motorola maintains a number of parts offices strategically-located throughout the United States. These facilities are staffed to process parts orders, identify part numbers, and otherwise assist in the maintenance and repair of Motorola Communications Sector products.

Orders for all parts *except* crystals, active filters, channel elements, and Vibrasender and Vibrasponder resonant reeds should be sent to the nearest area parts center. Orders for instruction manuals should also be sent to the area parts center.

When ordering replacement parts or equipment information, the complete identification number should be included. This applies to all components, kits, and chassis. If the component part number is not known,

the order should include the number of the chassis or kit of which it is a part, and sufficient description of the desired component to identify it.

Orders for crystals, channel elements, active filters, and reeds should be sent to the Component Product Sales & Service address listed below. Crystal and channel element orders should specify the crystal or channel element type number, crystal and carrier frequency, and the model number in which the part is used.

Orders for active filters, Vibrasender and Vibrasponder resonant reeds should specify type number and frequency, should identify the owner/operator of the communications system in which these items are to be used; and should include any serial numbers stamped on the components being replaced.

COMPONENT PRODUCT SALES & SERVICE OFFICE (crystals, active filters, channel elements and reeds)

All Mail Orders
Motorola, Inc.
Component Product Sales & Service
P.O. Box 66191, O'Hare International Airport
Chicago, IL 60666

Correspondence
Motorola, Inc.
Component Product Sales & Service
2553 N. Edgington Street, Franklin Park, IL 60131
Tel: 312-451-1000, TWX: 910-227-0799

AREA PARTS OFFICES

Western Area Parts
1170 Chess Drive, Foster City, CA 94404
Tel: 415-349-3111, TWX: 910-375-3877

Pacific-Southwestern Area Parts
P.O. Box 85036, San Diego, CA 92138
Street Address:
9980 Carroll Canyon Road, San Diego, CA 92131
Tel: 619-578-8030, TWX: 910-335-1633

Gulf States Area Parts
P.O. Box 73115, 1140 Cypress Station, Houston, TX 77090
Tel: 713-537-3636, TWX: 910-881-6392

Southwestern Area Parts
P.O. Box 819049, 3320 Belt Line Road, Dallas, TX 75234
Tel: 214-888-6777, TWX: 910-860-5505

Midwest Area Parts
1313 E. Algonquin Rd., Schaumburg, IL 60196
Tel: 312-576-7430, TWX: 910-693-0869

Southeastern Area Parts
P.O. Box 368, Decatur, GA 30031
Street Address:
5096 Panola Industrial Blvd., Decatur, GA 30031
Tel: 404-987-2232, TWX: 810-766-0876

Rocky Mountain Area Parts
20 Inverness Place East, Englewood, CO 80112
Tel: 303-790-2323, TWX: 910-935-0785

East Central Area Parts
12955 Snow Road, Parma, OH 44130
Tel: 216-433-1560, TWX: 810-427-9424

Eastern Area Parts
85 Harristown Road, Glen Rock, NJ 07452
Tel: 201-670-9673, TWX: 710-988-5614

Mid-Atlantic Area Parts
7230 Parkway Drive, Hanover, MD 21076
Tel: 301-796-8763, TWX: 710-862-1941

National Accounts
Railroad, Airlines, and Telephone Sales
1313 E. Algonquin Rd., Schaumburg, IL 60196
Tel: 312-576-6520, TWX: 910-693-0869

All Canadian Orders
Motorola, Ltd., National Parts Department
3125 Steeles, Ave. E., North York, Ontario M2H 2H6
Tel: 416-499-1441, TWX: 610-491-1032,
Telex: 06-526258

National Data Services

1171 West 17th Street, Tempe, AZ 85281
Tel: 602-994-6472, TWX: 910-951-1334

All Countries Except U.S. & Canada

Motorola, Inc., International Parts Department
1313 E. Algonquin Rd., Schaumburg, IL 60196. U.S.A.
Tel: 312-576-7241, TWX: 910-693-0869
Telex: 722443, Cable: MOTOL PARTS

GENERAL SAFETY INFORMATION

The United States Department of Labor, through the provisions of the Occupational Safety and Health Act of 1970 (OSHA), has established an electromagnetic energy safety standard which applies to the use of this equipment. Proper use of this radio will result in exposure below the OSHA limit. The following precautions are recommended:

DO NOT operate the transmitter of a mobile radio when someone outside the vehicle is within two feet (0.6 meter) of the antenna.

DO NOT operate the transmitter of a fixed radio (base station, microwave and rural telephone rf equipment) or marine radio when someone is within two feet (0.6 meter) of the antenna.

DO NOT operate the transmitter of any radio unless all RF connectors are secure and any open connectors are properly terminated.

In addition,

DO NOT operate this equipment near electrical blasting caps or in an explosive atmosphere.

All equipment must be properly grounded according to Motorola installation instructions for safe operation.

All equipment should be serviced only by a qualified technician.

Refer to the appropriate section of the product service manual for additional pertinent safety information.

EPS-28750-O

