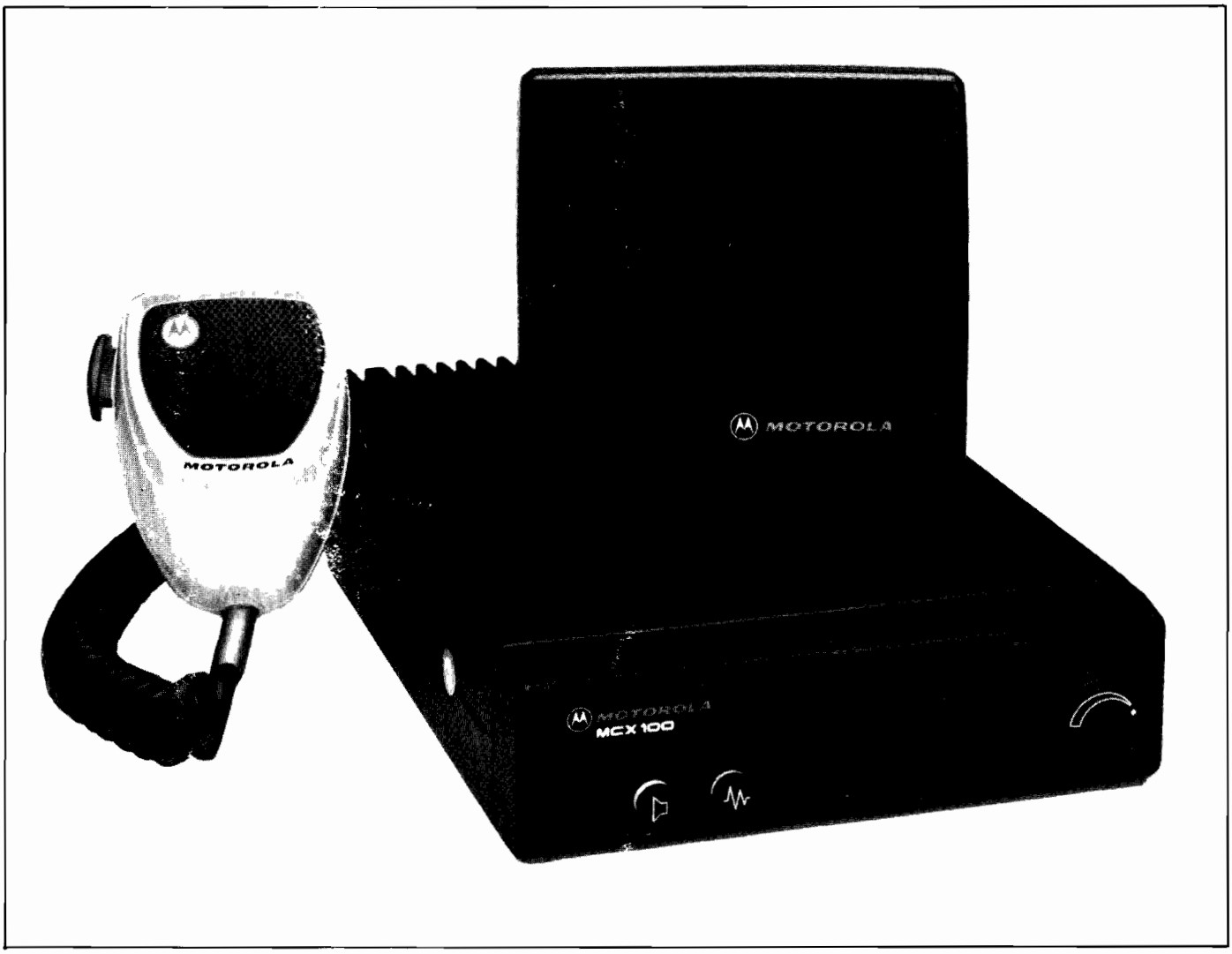
MOTOROLA

MCX100™

Two-Way FM Radio

6/10 W and 25/30 W RF Power
403-430 and 440-470 MHz

"EMA" SERIES



THIS MANUAL HAS BEEN
DISCONTINUED

Instruction Manual

68P81045E30-O

MOTOROLA INC.
Communications
Sector

MCX100
Two-Way FM Radio
6/10 W and 25/30 W RF Power
403-430 and 440-470 MHz

CONTENTS

technical writing services
1301 E. Algonquin Road, Schaumburg, Il. 60196

68P81045E30-O
5/19/83-PHI

(Pages iii through vi are omitted due to irrelevancy)

SPECIFICATIONS

GENERAL

Number of Frequencies	2 to 32 channels, synthesized
Type of Squelch	1000 Series: Carrier Squelch 7000 Series: *Private-Line* and *Digital Private-Line* 9000 Series: *Select 5*
Primary Power	12 V dc nominal, negative ground
Dimensions	6/10 Watt Models: 22.8cm L x 17.9cm W x 5.1 cm H (8.9" L x 7" W x 2" H)
	25/30 Watt Models: 27.9cm L x 17.9cm W x 5.1cm H (10.9" L x 7" W x 2" H)
Weight	6/10 Watt Models: 3.0kg (6.4 lb.)
	25/30 Watt Models: 3.3kg (7 lb.)

			Typical Battery Current Drain (Less Options)		
Model Series	**Minimum RF Power Output**	**Frequency Range (MHz)**	**Standby @13.8 V**	**Receive at Rated Audio @13.8 V**	**Transmit at Rated Power @13.8 V**
D/T14EMA	6 Watts	403-430, 440-470	550 mA	1.3A	3.5A
D/T24EMA	10 Watts	403-430, 440-470	550 mA	1.3A	4.0A
D/T34EMA	25 Watts	403,430, 440-470	550 mA	1.3A	8.5A
D/T44EMA	30 Watts	403-430, 440-470	550 mA	1.3A	9.0A

TRANSMITTER

Output Impedance	50 Ohms
Frequency Stability	± .0005% from − 30°C to + 60°C (± 0.0002% optional) (+ 25°C reference)
Spurious and Harmonics	6/10 Watt Models: 80 dB below carrier 25/30 Watt Models: 85 dB below carrier (less than 2 x 10^{-7} watts all models)
Modulation	(16F3) ± 5 kHz for 100% @1000 Hz (25 kHz and Japan) ± 2.5 kHz for 100% @1000 Hz (12.5 kHz) ± 4 kHz for 100% @1000 Hz (20 kHz)
Audio Sensitivity	80 mV nominal for 60% system deviation.
FM Noise	45 dB (40 dB @12.5 kHz EIA)
Audio Response	+ 1/ − 3 dB from 300 to 3000 Hz + 1/ − 1.5 dB from 400 to 2700 Hz + 1/ − 3 dB from 300 to 2250 Hz (12.5 kHz models) + 1/ − 3 dB from 300 to 3000 Hz (Japan models)
Audio Distortion	Less than 3% (4% Japan models) at 1000 Hz at 60% deviation
Frequency Separation	27 or 30 MHz

RECEIVER

Audio Output	EIA: 5 Watts @3% distortion CEPT: 3 Watts @10% distortion
Input Impedance	50 Ohms
EIA Modulation Acceptance	± 7 kHz @25 kHz channel spacing ± 6 kHz @20 kHz channel spacing ± 4 kHz @12.5 kHz channel spacing
Frequency Stability	± 0.0005% (± .0002% optional) from − 30°C to + 60° ambient (+ 25°C reference)
Squelch Sensitivity	Carrier Squelch: 10 dBq (fixed) PL/DPL: 6 dBq (fixed)
Maximum Frequency Separation	6 MHz standard (12 MHz optional)
Spurious and Image Rejection	90 dB
Sensitivity	20 dB Quieting: .35 uV EIA SINAD: .28 uV
Intermodulation	25/20 kHz Channel Spacing: 80 dB 12.5 kHz Channel Spacing: 70 dB

Selectivity	EIA	CEPT
25 kHz Channel Spacing:	85	80
20 kHz Channel Spacing:	80	75
12.5 kHz Channel Spacing:	70	70

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

FCC DESIGNATION

Model Series	**Transmitter Power**	**Applicable Rules of Parts**	**Emissions Authorized**	**Type Acceptance Numbers**
D/T14EMA	6 Watts	22, 90, 74	15F2, 16F3, 16F9	ABZ9QBT4621
D/T24EMA	10 Watts			ABZ9QBT4621
D/T34EMA	25 Watts			ABZ9QBT4622
D/T44EMA	30 Watts			ABZ9QBT4622

UHF *MCX100* MOBILE RADIO

EMA SERIES MODELS

FRONT MOUNT

R1 = 403-430 MHz
RIII = 440-470 MHz

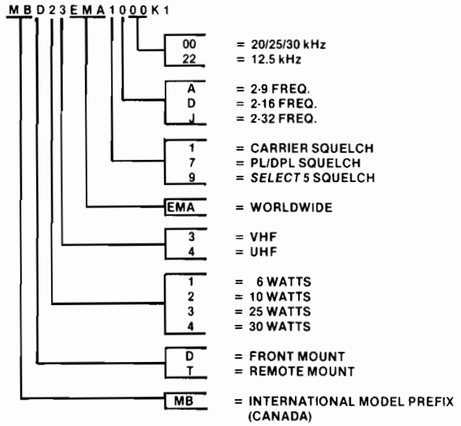
CODE:

★ = ONE ITEM SUPPLIED PER FIVE RADIOS
● = ONE ITEM SUPPLIED WITH EACH RADIO
0 = ONE ITEM SUPPLIED DEPENDENT UPON FREQUENCY
2 = NUMBER INDICATES QUANTITY SUPPLIED

NOTES:

1. REFER TO SEPARATE BREAKDOWN CHART FOR LOWER LEVEL KITS.
2. REFER TO ANTENNA INSTRUCTION SECTION 68P81110A47.

NOMENCLATURE



ITEM	NOTE	DESCRIPTION
TAE6051A	2	ANTENNA 403-430 MHz
TAE6052A	2	ANTENNA 440-470 MHz
TFE6511A		HARMONIC FILTER/ANTENNA SWITCH RI
TFE6513A		HARMONIC FILTER/ANTENNA SWITCH RIII
TKN8159C		POWER CABLE (12.5/20 kHz CHANNEL SPACING)
TKN8158C		POWER CABLE (25 kHz CHANNEL SPACING)
TLE2301A	1	VCO ASSEMBLY RI
TLE2303A	1	VCO ASSEMBLY RIII
TLE2251A	1	25/30 W POWER AMPLIFIER ASSEMBLY RI
TLE2253A	1	25/30 W POWER AMPLIFIER ASSEMBLY RIII
TLE5521A	1	10 WATT POWER AMPLIFIER RI
TLE2291A	1	SINGLE FRONT END ASSEMBLY
TLE5461A		LOW LEVEL AMPLIFIER RIII
TLE5471A		10 W POWER AMPLIFIER RIII
TLN2348C	1	CEPT/MULTI-CODE PL/DPL ASSEMBLY
TLE5531A	1	LOW LEVEL AMPLIFIER RI
TLN2409A	1	CHASSIS ASSEMBLY
TRN5440A	1	SYNTHESIZER, STANDARD LOCK 5PPM
TMN1024A	1	MICROPHONE, STANDARD
TMN1025A	1	MICROPHONE, SIGNALING
TRN5521A		MAIN BOARD, 25/30 kHz CHANNEL SPACING
TRN5522A		MAIN BOARD, 12.5 kHz CHANNEL SPACING
TRN5523A		MAIN BOARD, 20 kHz CHANNEL SPACING
TRN4604A		BUSY LIGHT KIT
TRN4606B		DISPLAY BOARD, 2-32 FREQ.
TRN4608A		SWITCH BOARD, 2-16 FREQ.
TRN4609A		SWITCH BOARD, 2-32 FREQ.
TRN5241A		FRONT PANEL INTERCONNECT BOARD, STANDARD
TRN5244A		FRONT PANEL INTERCONNECT BOARD, SIGNALING
TRN4620A		FRONT PANEL FRAME
TRN4622A		VOLUME/FREQUENCY SWITCH PANEL
TRN4623A		BUTTON PANEL, CARRIER SQUELCH
TRN4624A		BUTTON PANEL, PL/DPL
TRN4644A		LENS, 2-32 FREQ.
TRN4645A		LENS, 2-32 FREQ. w/BUSY LIGHT
TRN4660A		MONITOR SWITCH w/BUTTON
TRN4661A		SINGLE DISPLAY KIT
TRN4666A		PROM, 16-CHANNEL/PL-DPL
TRN4670A		SYNTHESIZER PROM, 32-CHANNEL
TRN4671A		TUNING TOOL KIT
TRN4673A		TOP COVER
TRN5812A		BOTTOM COVER
TRN4675A		INSTALLATION KIT
TRN5369A		HARDWARE KIT
TRN5370A		PA INTERCONNECT BOARD, 25/30 W
TRN5371A		PA INTERCONNECT BOARD, 6/10 W
TRN5372A		10 W NAMEPLATE (25 kHz CHANNEL SPACING)
TRN4782A		6/10 W NAMEPLATE (12.5/20 kHz CHANNEL SPACING)
TRN5374A		25/30 W NAMEPLATE (25 kHz CHANNEL SPACING)
TRN4812A		25/30 W NAMEPLATE (12.5/20 kHz CHANNEL SPACING)
TRN4778A		TUNING PROBE ADAPTER
TSN6031A		SPEAKER
TRN5085A		GASKET, RF
TKN8249A		ASSEMBLY, PL/DPL CABLE CONNECTOR AND WIRES

MODEL	POWER (WATTS)	SQUELCH	CHANNELS	CHANNEL SPACING (kHz)
MBD14EMA1A00K	6	CARRIER	2-9	20
MBD14EMA1D00K	6	CARRIER	2-16	20
MBD14EMA1J00K	6	CARRIER	2-32	20
MBD14EMA7A00K	6	PL/DPL	2-9	20
MBD14EMA7D00K	6	PL/DPL	2-16	20
MBD14EMA7J00K	6	PL/DPL	2-32	20
MBD24EMA1A00K	10	CARRIER	2-9	25
MBD24EMA1D00K	10	CARRIER	2-16	25
MBD24EMA1J00K	10	CARRIER	2-32	25
MBD24EMA7A00K	10	PL/DPL	2-9	25
MBD24EMA7D00K	10	PL/DPL	2-16	25
MBD24EMA7J00K	10	PL/DPL	2-32	25
MBD24EMA1A22K	10	CARRIER	2-9	12.5
MBD24EMA1D22K	10	CARRIER	2-16	12.5
MBD24EMA1J22K	10	CARRIER	2-32	12.5
MBD24EMA7A22K	10	PL/DPL	2-9	12.5
MBD24EMA7D22K	10	PL/DPL	2-16	12.5
MBD24EMA7J22K	10	PL/DPL	2-32	12.5
MBD34EMA1A00K	25	CARRIER	2-9	25
MBD34EMA1D00K	25	CARRIER	2-16	25
MBD34EMA1J00K	25	CARRIER	2-32	25
MBD34EMA7A00K	25	PL/DPL	2-9	25
MBD34EMA7D00K	25	PL/DPL	2-16	25
MBD34EMA7J00K	25	PL/DPL	2-32	25
MBD34EMA1A22K	25	CARRIER	2-9	12.5
MBD34EMA1D22K	25	CARRIER	2-16	12.5
MBD34EMA1J22K	25	CARRIER	2-32	12.5
MBD34EMA7A22K	25	PL/DPL	2-9	12.5
MBD34EMA7D22K	25	PL/DPL	2-16	12.5
MBD34EMA7J22K	25	PL/DPL	2-32	12.5
MBD44EMA1A00K	30	CARRIER	2-9	25
MBD44EMA1D00K	30	CARRIER	2-16	25
MBD44EMA1J00K	30	CARRIER	2-32	25
MBD44EMA7A00K	30	PL/DPL	2-9	25
MBD44EMA7D00K	30	PL/DPL	2-16	25
MBD44EMA7J00K	30	PL/DPL	2-32	25

EPS-34256-O

ITEM	NOTE	DESCRIPTION
TAE6051A	2	ANTENNA 403-430 MHz
TAE6052A	2	ANTENNA 440-470 MHz
TFE6511A		HARMONIC FILTER/ANTENNA SWITCH RI
TFE6513A		HARMONIC FILTER/ANTENNA SWITCH RIII
TKN8171A		REMOTE CABLE (8 FT.)
TKN8175A		POWER CABLE, CONTROL HEAD (25 kHz CHANNEL SPACING)
TKN8176A		POWER CABLE, CONTROL HEAD (12.5/20 kHz CHANNEL SPACING)
TKN8266A		POWER CABLE (18 FT), REMOTE RADIO (12.5/20 kHz CHANNEL SPACING)
TKN8268A		POWER CABLE (18 FT) REMOTE RADIO (25 kHz CHANNEL SPACING)
TLE2301A	1	VCO ASSEMBLY RI
TLE2303A	1	VCO ASSEMBLY RIII
TLE2251A	1	25/30 W POWER AMPLIFIER ASSEMBLY RI
TLE2253A	1	25/30 W POWER AMPLIFIER ASSEMBLY RIII
TLE2291A		SINGLE FRONT END ASSEMBLY
TLE5461A		LOW LEVEL AMPLIFIER RIII
TLE5471A		10 W POWER AMPLIFIER RIII
TLN2348C	1	CEPT/MULTI-CODE PL/DPL ASSEMBLY
TLN2409A	1	CHASSIS ASSEMBLY
TRN5440A	1	SYNTHESIZER, STANDARD LOCK 5PPM
TMN1026A	1	MICROPHONE, STANDARD REMOTE
TMN1027A	1	MICROPHONE, SIGNALING REMOTE
TRN5521A		MAIN BOARD, 25/30 kHz CHANNEL SPACING
TRN5522A		MAIN BOARD, 12.5 kHz CHANNEL SPACING
TRN5523A		MAIN BOARD, 20 kHz CHANNEL SPACING
TRN4604A		BUSY LIGHT KIT
TRN4606B		DISPLAY BOARD, 2-32 FREQ.
TRN5241A		FRONT PANEL INTERCONNECT BOARD STANDARD
TRN5244A		FRONT PANEL INTERCONNECT BOARD, SIGNALING
TRN4620A		FRONT PANEL FRAME
TRN4622A		VOLUME/FREQUENCY SWITCH PANEL
TRN4623A		BUTTON PANEL, CARRIER SQUELCH
TRN4624A		BUTTON PANEL, PL/DPL
TRN4644A		LENS, 2-32 FREQ.
TRN4645A		LENS, 2-32 FREQ. w/BUSY LIGHT
TRN4660A		MONITOR SWITCH w/BUTTON
TRN4661A		SINGLE DISPLAY KIT
TRN4666A		PROM, 16-CHANNEL/PL-DPL
TRN4670A		PROM, 32-CHANNEL
TRN4671A		TUNING TOOL KIT
TRN4673A		TOP COVER
TRN5812A		BOTTOM COVER
TRN4675A		INSTALLATION KIT
TRN4763B		BASIC REMOTE INTERFACE BOARD
TRN4766A		REMOTE SWITCH BOARD, 2-16 FREQ.
TRN4767A		REMOTE SWITCH BOARD, 2-32 FREQ.
TRN4772A		REMOTE HARDWARE KIT
TRN5369A		HARDWARE KIT
TRN5370A		PA INTERCONNECT BOARD 25/30 W
TRN5371A		PA INTERCONNECT BOARD 6/10 W
TRN5372A		10 W NAMEPLATE (25 kHz CHANNEL SPACING)
TRN4782A		6/10 W NAMEPLATE (12.5/20 kHz CHANNEL SPACING)
TRN5374A		25/30 W NAMEPLATE (25 kHz CHANNEL SPACING)
TRN4812A		25/30 W NAMEPLATE (12.5/20 kHz CHANNEL SPACING)
TSN6031A		SPEAKER
TRN4778A		TUNING PROBE ADAPTER
TRN5085A		GASKET, RF
TKN8249A		ASSEMBLY, CABLE CONNECTOR AND WIRES
TLE5521A		10 WATT POWER AMPLIFIER RI
TLE5531A		LOW LEVEL AMPLIFIER RI

MODEL	POWER (WATTS)	SQUELCH	CHANNELS	CHANNEL SPACING (kHz)
MBT14EMA1A00K	6	CARRIER	2-9	20
MBT14EMA1D00K	6	CARRIER	2-16	20
MBT14EMA1J00K	6	CARRIER	2-32	20
MBT14EMA7A00K	6	PL/DPL	2-9	20
MBT14EMA7D00K	6	PL/DPL	2-16	20
MBT14EMA7J00K	6	PL/DPL	2-32	20
MBT24EMA1A00K	10	CARRIER	2-9	25
MBT24EMA1D00K	10	CARRIER	2-16	25
MBT24EMA1J00K	10	CARRIER	2-32	25
MBT24EMA7A00K	10	PL/DPL	2-9	25
MBT24EMA7D00K	10	PL/DPL	2-16	25
MBT24EMA7J00K	10	PL/DPL	2-32	25
MBT24EMA1A22K	10	CARRIER	2-9	12.5
MBT24EMA1D22K	10	CARRIER	2-16	12.5
MBT24EMA1J22K	10	CARRIER	2-32	12.5
MBT24EMA7A22K	10	PL/DPL	2-9	12.5
MBT24EMA7D22K	10	PL/DPL	2-16	12.5
MBT24EMA7J22K	10	PL/DPL	2-32	12.5
MBT34EMA1A00K	25	CARRIER	2-9	25
MBT34EMA1D00K	25	CARRIER	2-16	25
MBT34EMA1J00K	25	CARRIER	2-32	25
MBT34EMA7A00K	25	PL/DPL	2-9	25
MBT34EMA7D00K	25	PL/DPL	2-16	25
MBT34EMA7J00K	25	PL/DPL	2-32	25
MBT34EMA1A22K	25	CARRIER	2-9	12.5
MBT34EMA1D22K	25	CARRIER	2-16	12.5
MBT34EMA1J22K	25	CARRIER	2-32	12.5
MBT34EMA7A22K	25	PL/DPL	2-9	12.5
MBT34EMA7D22K	25	PL/DPL	2-16	12.5
MBT34EMA7J22K	25	PL/DPL	2-32	12.5
MBT44EMA1A00K	30	CARRIER	2-9	25
MBT44EMA1D00K	30	CARRIER	2-16	25
MBT44EMA1J00K	30	CARRIER	2-32	25
MBT44EMA7A00K	30	PL/DPL	2-9	25
MBT44EMA7D00K	30	PL/DPL	2-16	25
MBT44EMA7J00K	30	PL/DPL	2-32	25

EPS-34258-O

UHF *MCX100* MOBILE RADIO

CARRIER AND PL/DPL SQUELCH

EMA SERIES MODELS

REMOTE MOUNT

RI = 403-430 MHz
RIII = 440-470 MHz

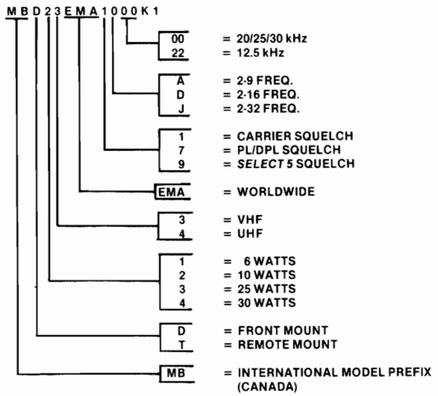
CODE:

✱ = ONE ITEM SUPPLIED PER FIVE RADIOS
● = ONE ITEM SUPPLIED WITH EACH RADIO
0 = ONE ITEM SUPPLIED DEPENDENT UPON FREQUENCY
2 = NUMBER INDICATES QUANTITY SUPPLIED

NOTES:

1. REFER TO SEPARATE BREAKDOWN CHART FOR LOWER LEVEL KITS.
2. REFER TO ANTENNA INSTRUCTION SECTION 68P81110A47.

NOMENCLATURE



UHF *MCX100* MOBILE RADIO

SELECT 5 SIGNALING

EMA SERIES MODELS

FRONT/REMOTE MOUNT

RI = 403-430 MHz
RIII = 440-470 MHz

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★ = ONE ITEM SUPPLIED PER FIVE RADIOS
● = ONE ITEM SUPPLIED WITH EACH RADIO
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2 = NUMBER INDICATES QUANTITY SUPPLIED

NOTES:

1. REFER TO SEPARATE BREAKDOWN CHART FOR LOWER LEVEL KITS.
2. REFER TO ANTENNA INSTRUCTION SECTION 68P81110A47.
3. REFER TO *SELECT 5* SUPPLEMENT MANUAL 68P81047E40 FOR KIT INFORMATION.

NOMENCLATURE

MBD23EMA1000K1

- 00 = 20/25/30 kHz
- 22 = 12.5 kHz
- A = 2-9 FREQ.
- D = 2-16 FREQ.
- J = 2-32 FREQ.
- 1 = CARRIER SQUELCH
- 7 = PL/DPL SQUELCH
- 9 = *SELECT 5* SQUELCH
- EMA = WORLDWIDE
- 3 = VHF
- 4 = UHF
- 1 = 6 WATTS
- 2 = 10 WATTS
- 3 = 25 WATTS
- 4 = 30 WATTS
- D = FRONT MOUNT
- T = REMOTE MOUNT
- MB = INTERNATIONAL MODEL PREFIX (CANADA)

ITEM	NOTE	DESCRIPTION
TAE6051A	2	ANTENNA 403-430 MHz
TAE6052A	2	ANTENNA 440-470 MHz
TFE6511A		HARMONIC FILTER/ANTENNA SWITCH RI
TFE6513A		HARMONIC FILTER/ANTENNA SWITCH RIII
TKN8171A		REMOTE CABLE (8 FT.)
TKN8175A		POWER CABLE, CONTROL HEAD (25 kHz CHANNEL SPACING)
TKN8176A		POWER CABLE, CONTROL HEAD (12.5/20 kHz CHANNEL SPACING)
TKN8159C		POWER CABLE (12.5/20 kHz CHANNEL SPACING)
TKN8266A		POWER CABLE (18 FT), REMOTE RADIO (12.5/20 kHz CHANNEL SPACING)
TKN8158C		POWER CABLE (25 kHz CHANNEL SPACING)
TKN8268A		POWER CABLE (18 FT) REMOTE RADIO (25 kHz CHANNEL SPACING)
TLE2301A	1	VCO ASSEMBLY RI
TLE2303A	1	VCO ASSEMBLY RIII
TLE2251A	1	25/30 W POWER AMPLIFIER ASSEMBLY RI
TLE2253A	1	25/30 W POWER AMPLIFIER ASSEMBLY RIII
TLE2291A	1	SINGLE FRONT END ASSEMBLY
TLE5461A		LOW LEVEL AMPLIFIER RIII
TLE5471A		10 W POWER AMPLIFIER RIII
TLN2325A	3	*SELECT 5* SINGLE BOARD ASSEMBLY
TLN2409A	1	CHASSIS ASSEMBLY
TRN5440A	1	SYNTHESIZER STANDARD LOCK, 5PPM
TMN1025A	1	MICROPHONE, SIGNALING
TMN1027A	1	MICROPHONE, SIGNALING REMOTE
TRN5521A		MAIN BOARD, 25/30 kHz CHANNEL SPACING
TRN5522A		MAIN BOARD, 12.5 kHz CHANNEL SPACING
TRN5523A		MAIN BOARD, 20 kHz CHANNEL SPACING
TRN4604A		BUSY LIGHT KIT
TRN4606B		DISPLAY BOARD, 2-32 FREQ
TRN4608A		SWITCH BOARD, 2-16 FREQ
TRN4609A		SWITCH BOARD, 2-32 FREQ
TRN5244A		FRONT PANEL INTERCONNECT BOARD, SIGNALING
TRN4620A		FRONT PANEL FRAME
TRN4622A		VOLUME/FREQUENCY SWITCH PANEL
TRN4625A	3	BUTTON PANEL, BASIC *SELECT 5*
TRN4646A	3	LENS, 2-32 FREQ. w/BUSY LIGHT AND CALL LIGHT
TRN4658A		CALL SWITCH w/BUTTON
TRN4660A		MONITOR SWITCH w/BUTTON
TRN4661A		SINGLE DISPLAY KIT
TRN4666A		PROM, 16-CHANNEL/PL-DPL
TRN4668A		PROM, *SELECT 5*
TRN4670A		PROM, 32-CHANNEL
TRN4671A		TUNING TOOL KIT
TRN4673A		TOP COVER
TRN5812A		BOTTOM COVER
TRN4675A		INSTALLATION KIT
TRN4763B		BASIC REMOTE INTERFACE BOARD
TRN4766A		REMOTE SWITCH BOARD, 2-16 FREQ.
TRN4767A		REMOTE SWITCH BOARD, 2-32 FREQ.
TRN4772A		REMOTE HARDWARE KIT
TRN4778A		TUNING PROBE ADAPTER
TRN4782A		6/10 W NAMEPLATE (12.5/20 kHz CHANNEL SPACING)
TRN4812A		25/30 W NAMEPLATE (12.5/20 kHz CHANNEL SPACING)
TRN5369A		HARDWARE KIT
TRN5370A		PA INTERCONNECT BOARD 25/30 W
TRN5371A		PA INTERCONNECT BOARD 6/10 W
TRN5372A		10 W NAMEPLATE (25 kHz CHANNEL SPACING)
TRN5374A		25/30 W NAMEPLATE (25 kHz CHANNEL SPACING)
TSN6031A		SPEAKER
TRN5085A		GASKET, RF
TKN8250A		ASSEMBLY, CABLE CONNECTOR AND WIRES
TLE5521A		10 WATT POWER AMPLIFIER RI
TLE5531A		LOW LEVEL AMPLIFIER RI

MODEL	POWER (WATTS)	CHANNELS	CHANNEL SPACING (kHz)
		FRONT MOUNT	
MBD14EMA9A00K	6	2-9	20
MBD14EMA9D00K	6	2-16	20
MBD14EMA9J00K	6	2-32	20
MBD24EMA9A00K	10	2-9	25
MBD24EMA9D00K	10	2-16	25
MBD24EMA9J00K	10	2-32	25
MBD24EMA9A22K	10	2-9	12.5
MBD24EMA9D22K	10	2-16	12.5
MBD24EMA9J22K	10	2-32	12.5
MBD34EMA9A00K	25	2-9	25
MBD34EMA9D00K	25	2-16	25
MBD34EMA9J00K	25	2-32	25
MBD34EMA9A22K	25	2-9	12.5
MBD34EMA9D22K	25	2-16	12.5
MBD34EMA9J22K	25	2-32	12.5
MBD44EMA9A00K	30	2-9	25
MBD44EMA9D00K	30	2-16	25
MBD44EMA9J00K	30	2-32	25
		REMOTE MOUNT	
MBT14EMA9A00K	6	2-9	20
MBT14EMA9D00K	6	2-16	20
MBT14EMA9J00K	6	2-32	20
MBT24EMA9A00K	10	2-9	25
MBT24EMA9D00K	10	2-16	25
MBT24EMA9J00K	10	2-32	25
MBT24EMA9A22K	10	2-9	12.5
MBT24EMA9D22K	10	2-16	12.5
MBT24EMA9J22K	10	2-32	12.5
MBT34EMA9A00K	25	2-9	25
MBT34EMA9D00K	25	2-16	25
MBT34EMA9J00K	25	2-32	25
MBT34EMA9A22K	25	2-9	12.5
MBT34EMA9D22K	25	2-16	12.5
MBT34EMA9J22K	25	2-32	12.5
MBT44EMA9A00K	30	2-9	25
MBT44EMA9D00K	30	2-16	25
MBT44EMA9J00K	30	2-32	25

Chassis Assembly Breakdown Chart

TLN2409A Chassis Assembly
- TRN5366A Synthesizer Interconnect Board
- TRN5365A Power Interconnect Board
- TRN4602A Transmitter Feedthrough Plate
- TRN5367A Chassis Hardware

INTERNAL OPTION TABLE

Option No.	Description	Kits Added	Kits Deleted	Manual Reference
	All Models			
B460	2 ppm Stability	TRN5376A	TRN5440A	This Manual
B434	Receiver Dual Front End	TLE2261A	TLE2291A	This Manual
B462	*Fast-Lok* Synthesizer	TRN5441A TLE2321A or TLE2323A	TRN5440A TLE2301A or TLE2303A	This Manual
B310	Low Range	Substitute Range I Kits		This Manual
B216	20 kHz Channel Spacing (25 kHz Models)	TRN5523A	TRN5521A	This Manual
B88	25 kHz Channel Spacing (20 kHz Models)	TRN5521A	TRN5523A	This Manual
B361	30 W RF Power (25 W Models)	none	none	This Manual
B280	25 W RF Power (30 W Models)	none	none	This Manual
	Carrier Squelch Models			
B11	Time-Out Timer (60 Seconds)	TRN5666A	none	This Manual
B287	Non-Standard Time-Out Timer	none	none	This Manual
B313	Selectable Single-Tone Encode	TLN2394B	none	This Manual
B75	Omit Time-Out Timer on Single-Tone Models	none	none	This Manual
	PL/DPL Squelch Models			
B75	Omit Time-Out Timer	none	none	—
B287	Non-Standard Time-Out Time	none	none	This Manual
B463	Selectable PL/DPL 1-10 Codes	TRN4661A TRN4663A TRN4797A	none none none	This Manual
B290	Selectable PL/DPL 1-30 Codes	TRN4661A TRN4664A TRN4797A	none none none	This Manual
B446	Decode Only	none	none	This Manual
B445	Encode Only (Front Mount)	TMN1024A	TMN1025A, TRN4660A, & TRN4604A	This Manual
	Encode Only (Remote Mount)	TMN1026A	TMN1027A, TRN4604A, & TRN4660A	This Manual
	***Select 5** Signaling Models*			
	Refer to *Select 5* Manual Supplement 68P81047E40 for *Select 5* Signaling option information.			
	*Models with **Channel Scan** Monitor Option*			
	Refer to *Channel Scan* Option Manual 68P81047E45 Supplement for *Channel Scan* Monitor option information.			

SPECIFICATION OPTION

Option No.	Description	Kits Added	Kits Deleted	Manual Reference
B114	Japan	TRN5524A	TRN5521A	This Manual
B275	Canada			
B435	France			
B436	Germany			
B437	Switzerland			
B438	Australia			
B439	South Africa			
B701	CEPT			

NOTE
Other specification options change nameplate and tune-up/alignment procedure only.

EXTERNAL OPTION TABLE

Option No.	Description	Kits Added	Kits Deleted	Manual Reference
		Antennas		
B70	Omit Antenna	none	TAE6051/2/3 (Note 1)	—
		Installation		
B71	Omit Microphone	none	Note 1	—
B87	Omit Speaker	none	TSN6031A	—
B161	Omit Battery Cable	none	Note 1	—
B65	Omit Installation Kit	none	TRN4675A	—
B90	Omit All Accessories	none	Note 1	—
B296	Mounting Tray w/Latches	TRN4678A	TRN4675A	This Manual
B297	Mounting Tray w/Right Hand Lock	TRN4679A	TRN4675A	This Manual
B298	Mounting Tray w/Left Hand Lock	TRN4680A	TRN4675A	This Manual
B113	Ignition Control PTT	TKN8177A (12.5/20 kHz Channel Spacing) Front or TKN8160A (25 kHz Channel Spacing) Front or TKN8197A (25 kHz Channel Spacing) Remote or TKN8198A (12.5/20 kHz Channel Spacing) Remote	none	This Manual
B564	Remote Speaker (17' Cable)	TSN6032A	TSN6031A	This Manual
B654	Long Control Cable (17' Cable)	TKN8172A	TKN8171A	This Manual
B301	Alternate Microphone Location	TMN1024A or TMN1025A	TMN1026A or TMN1027A	This Manual This Manual
B465	Base Station	Note 1	Note 1	

NOTE: 1. Depends on radio model.

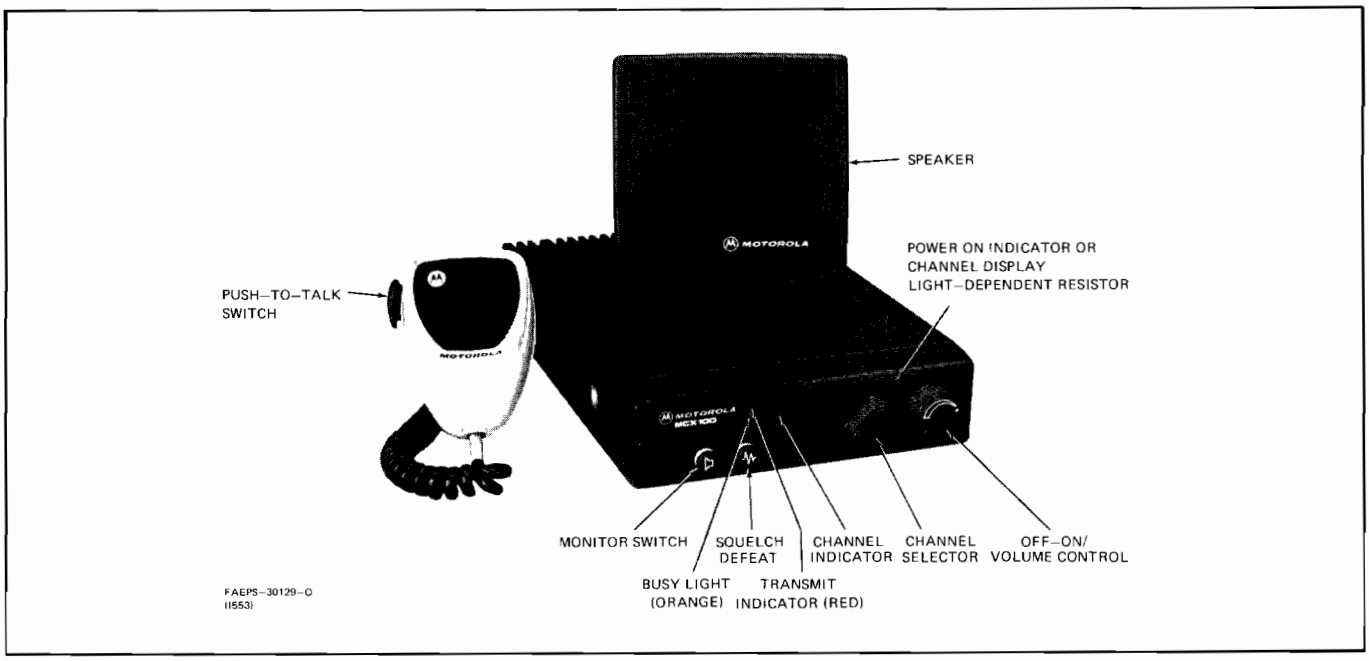


Figure 1.
*Typical **MCX100** Radio Set Controls and Indicators*

1. INTRODUCTION

1.1 The *MCX100* Radio Set has been designed to meet worldwide radio frequency specifications. The radio set operates in the UHF frequency ranges of 403-430 and 440-470 MHz, and, depending on the model used, can provide rf power output of 6, 10, 25, or 30 watts in systems employing minimum channel spacing of 12.5, 20 or 25 kHz. Models allowing use of up to 32 channels are available.

1.2 The extreme flexibility of the *MCX100* radio in various system applications is provided by the availability of microprocessor-based signaling configurations. These are *Private-Line* (PL) tone-coded squelch, *Digital Private-Line* (DPL) coded squelch, and *Select 5* five-tone sequential signaling. Options to these signaling configurations are available to further customize the radio to the individual user.

1.3 Flexibility of the radio is also enhanced by the availability of several mounting configurations and options. Models are available which allow front mounting, either from above or below or, by using a hinge mount, from the floor of the vehicle. Other models allow mounting the radio in a remote location such as the trunk or floor, using a remote control head. Special security screws and locking hardware are available for all models to provide increased security from theft.

2. *MCX100* OPTIONS

MCX100 radios can include the following options:

- Time-out-timer to limit transmission duration (standard on PL/DPL and *Select 5* models).

- Special PL/DPL squelch signaling options such as Encode Only and Selectable PL allow special operator functions. Refer to the option chart in this manual for information on manual coverage.

- Special *Select 5* signaling options (refer to *Select 5* signaling manual supplement for details). (See Table 1.)

- Widespace (dual front end) receiver allows wider receiver overall channel spacing.

- *Fast-Lok* synthesizer allows for fast channel changing (included as part of priority Channel Scan option.)

- Ignition push-to-talk control to allow monitoring of radio while preventing unauthorized use of transmitter.

- *Channel Scan* monitor to allow monitoring of several channels simultaneously.

- Hinged and locking mounting hardware for greater flexibility and security in radio installation.

- Base station accessories to allow use of radio as a base station.

Refer to the option chart in this manual for a list of available options and location of servicing information.

3. INSTRUCTION MANUALS

3.1 Installation, operation, and servicing information for the *MCX100* radio is covered in several instruction manuals, depending on the level of information required. Refer to Table 1 for a list of *MCX100* Radio Owners Manuals, Service Manuals, and Supplements. Service manuals may be ordered at time of equipment purchase, by contacting your Motorola service representative, or by writing to the following address:

Motorola, Incorporated
Communications Group Parts Department
1313 E. Algonquin Road
Schaumburg, Illinois 60196 U.S.A.

The option chart contained in this manual references manuals providing service information on particular options. The following is a brief description of the contents of manuals that may be required by the service technician.

3.2 This service manual contains all schematic diagrams, circuit board details, parts lists, and alignment information for standard carrier, tone-coded *Private-Line* squelch, and *Digital Private-Line* squelch radio models, and information on certain options available for these models.

3.3 Detailed theory of operation and maintenance procedures for the radio set are contained in a separate Theory of Operation manual.

3.4 The owner's manual packaged with each radio set provides detailed installation and operation procedures.

3.5 All information on *Select 5* signaling is contained in a supplement to this manual. The supplement contains model information, schematic diagrams, circuit board details, parts lists, theory of operation, maintenance, and troubleshooting information for all *Select 5* signaling configurations and options.

3.6 Information on *Channel Scan* monitoring is contained in a supplement to this manual. The supplement contains kit information, schematic diagrams, circuit board details, parts lists, theory of operation, operating instructions, maintenance, and troubleshooting information for all *Channel Scan* monitoring configurations.

Table 1. MCX100 Radio Service Manuals

Title	Manual Number
Instruction Manual (Theory/Maintenance)	68P81045E35
Select 5 Signaling Supplement	68P81047E40
Channel Scan Monitoring Supplement	68P81047E45
MCX100 Radio Owner's Manual, English (USA)	68P81111E81
MCX100 Radio Owner's Manual, English (International)	68P81110E80
MCX100 Radio Owner's Manual, French (Canada)	68P81110E85
MCX100 Radio Owner's Manual, French (Continental)	68P81111E54
MCX100 Radio Owner's Manual, German	68P81110E90
MCX100 Radio Owner's Manual, Spanish	68P81111E80

Note: All of the above manuals are NLA.

4. ELECTRICAL DESCRIPTION

4.1 RECEIVER

The standard *MCX100* radio receiver uses a bipolar junction transistor rf amp for high sensitivity and low noise, crystal filters for i-f selectivity, and integrated circuits for amplification, limiting, and detection. The standard front end provides a receive bandwidth of 6 MHz. An optional widespaced (dual) front end is available to allow a total receive bandwidth of 12 MHz.

4.2 TRANSMITTER

The transmitter circuitry amplifies the frequency-modulated low level rf output from the frequency synthesizer, and contains power regulation and protection circuitry for the power amplifier. A harmonic filter is used to attenuate spurious radiations, and a non-mechanical PIN diode transmit-receive switch circuit is used for reliability.

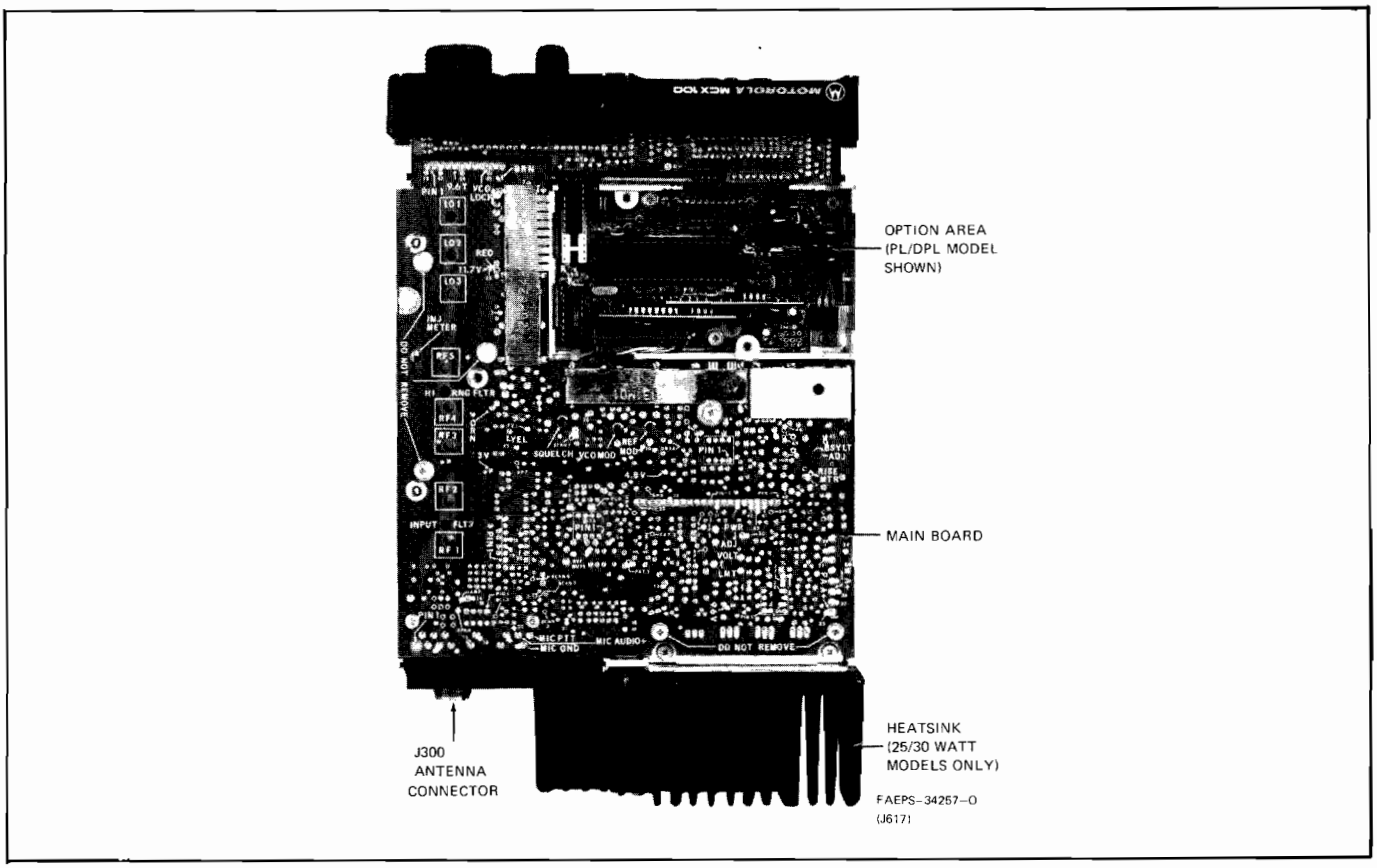


Figure 2.
*UHF **MCX100** Radio Top View with Cover Removed*

4.3 FREQUENCY SYNTHESIZER

4.3.1 In the receive mode the digital frequency synthesizer generates the low side injection signal that is applied to the mixer. During transmission the synthesizer generates the low level frequency modulated signal that is applied to the transmitter low level amplifier stage.

4.3.2 The frequency synthesizer includes a reference oscillator, a frequency modulated (in transmit mode) voltage controlled oscillator (VCO), and frequency selecting logic circuitry. The logic circuitry controls the operating frequency of the phase-locked VCO. Frequency select data from the binary-coded front panel frequency switch is applied to the programmable read-only memory (PROM) integrated circuit on the synthesizer board. The PROM is programmed with customer-specified data which determines the transmit and receive frequencies for each position.

5. PHYSICAL CHARACTERISTICS
(Refer to Figures 1, 2 and 3)

5.1 The radio set is constructed in a rugged cast metal chassis with separate top and bottom covers. The front of the radio housing contains the control knobs, buttons, and indicators. The back of the radio housing contains the connectors for external power, microphone, antenna, and external option connections. High power models (25 and 30 watts rf power) also have a heatsink on the back of the radio chassis for power transistor cooling.

5.2 Compartments inside the chassis isolate the PA, receiver front end, frequency synthesizer, option area, and main board from each other. Additional shields are mounted over sensitive components on the main board, and compartment shields are used over the synthesizer and power amplifier compartments.

5.3 The top and bottom covers are easily removed for service access. Most boards are connected to other radio circuitry with plug-in connectors, and may easily be removed from the radio for service or replacement by removing securing screws and pulling from the radio.

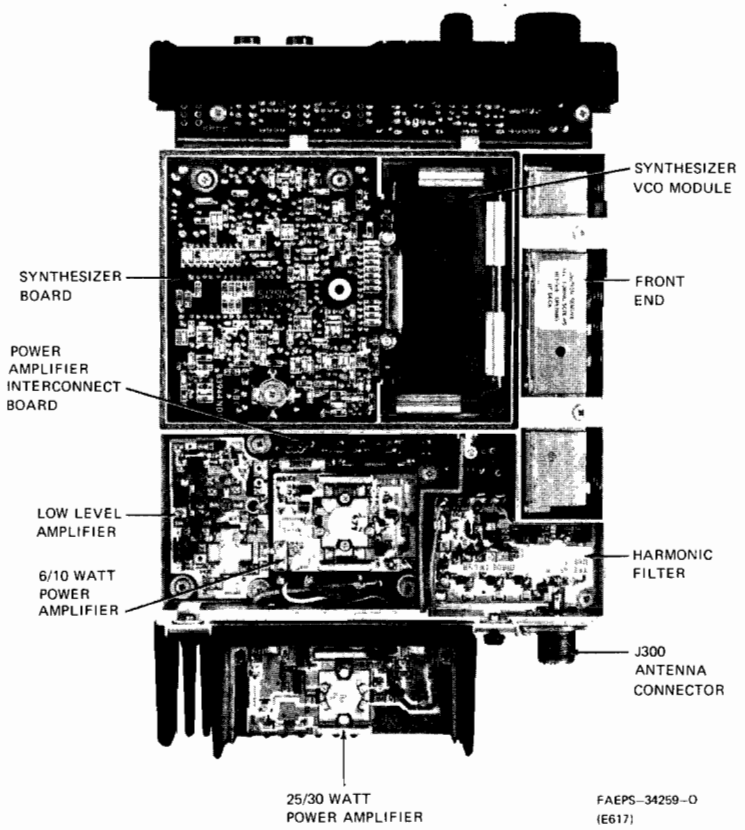


Figure 3.
*UHF **MCX100** Radio Bottom View with Cover Removed*

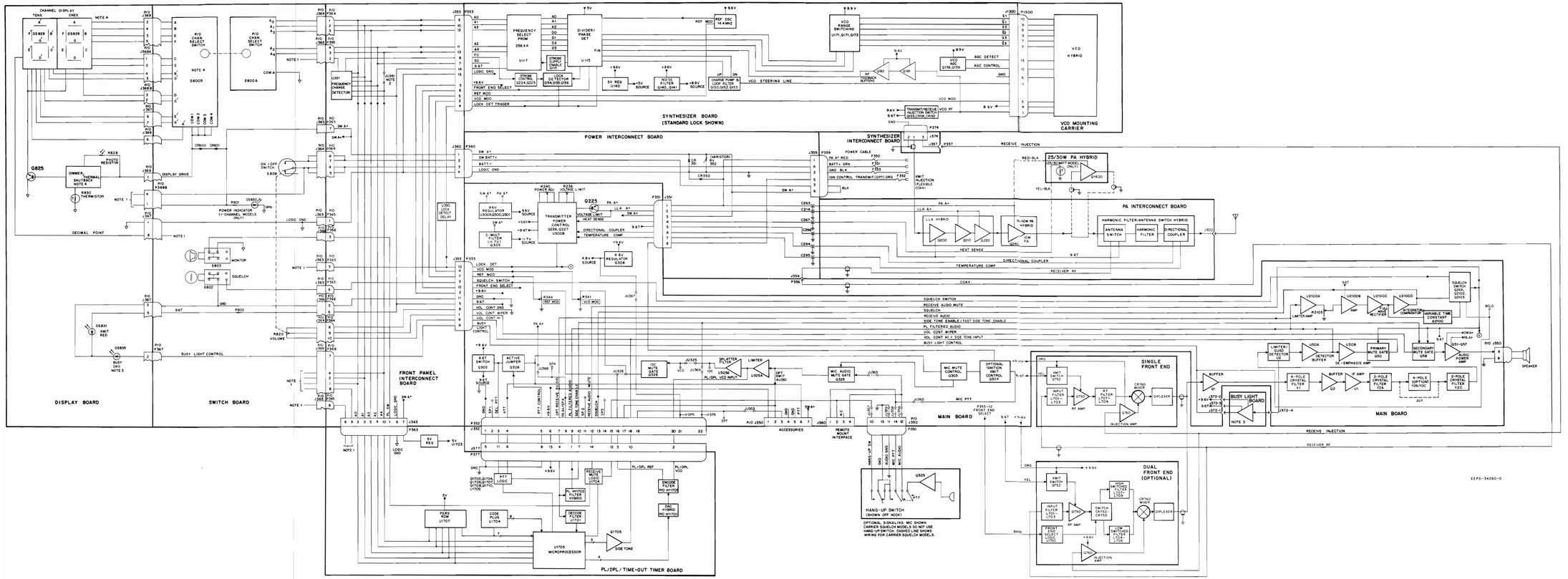
5.4 The front panel, switch, display, and circuit board assembly may easily be removed for service and testing without removing any circuit boards from the chassis.

6. SERVICE

Should you wish to purchase a service contract for your Motorola equipment, contact your Motorola service representative.

7. PREINSTALLATION TESTS

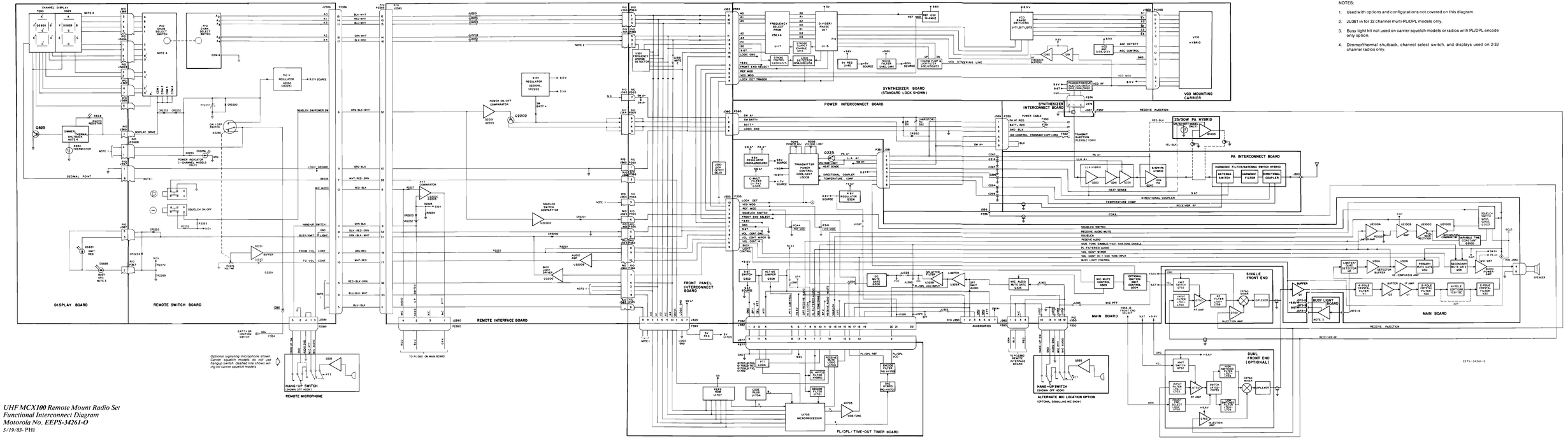
All *MCX100* radio sets are thoroughly tested and inspected before shipment to customers. It is, however, suggested the transmitter frequency, deviation, and power output be checked at the time of installation, after servicing, and periodically as required by applicable laws. It is the license holder's responsibility that the operating parameters of his station comply with applicable laws governing radio communication equipment.



NOTES:

1. Used with options and configurations not covered on this diagram.
2. JU361 in for 32 channel multi-PL/DPL models only.
3. Busy light kit not used on carrier squelch models or radios with PL/DPL encode only option.
4. Dimmer/thermal shutback, channel select switch, and displays used on 2-32 channel radios only.

UHF MCX100 Front Mount Radio Set
Functional Interconnect Diagram
Motorola No. EEPS-34260-O
5/19/83-PHI



NOTES:

1. Used with options and configurations not covered on this diagram.
2. JU361 in for 32 channel multi-PL/DPL models only.
3. Busy light kit not used on carrier squelch models or radios with PL/DPL encode only option.
4. Dimmer/thermal shutback, channel select switch, and displays used on 2-32 channel radios only.

*UHF **MCX100** Remote Mount Radio Set*
Functional Interconnect Diagram
Motorola No. EEPS-34261-O
5/19/83- PHI

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REMOVAL AND REPLACEMENT OF CHIP COMPONENTS ON CIRCUIT BOARDS

1. GENERAL

1.1 The equipment described in this instruction manual employs many chip capacitors, resistors, transistors, and diodes as circuit elements. Chip components are normally located on the solder side of those circuit boards using them.

1.2 During manufacture, chip components are positioned at the desired location on the circuit board by a three step, automated process. The first step in the process applies two epoxy glue dots to the specified chip component location on the circuit board. During the second step, the chip component is automatically (not by hand) applied to the desired location. After all chip components are located, and the epoxy glue dots have been allowed to cure, the circuit board is wave soldered in the third step of the process. The epoxy glue is provided with enough heat resistance to hold the chip components in place during the short wave soldering process.

1.3 Circuit board mounted chip components can be repaired, provided adequate care is taken to avoid "leaching" the chip component end terminations or lifting the circuit board copper pads. "Leaching" is caused by application of excessive heat to the component end terminations and is most often evidenced by failure of the chip component to take solder. Refer to Figure 1.

1.4 The chip components used in this equipment are manufactured with a plated metallic (nickel or similar metal) soldering barrier beneath the tin component end terminations. This barrier greatly reduces the possibility of the chip component being susceptible to "leaching".

1.5 As a result, the chip components used in this equipment are more durable than those previously encountered. Damage is still possible if non-temperature controlled soldering irons are used or if heat is applied to the component for a lengthy period of time. Normal 60-40 tin-lead solder may be used to solder these chip components.

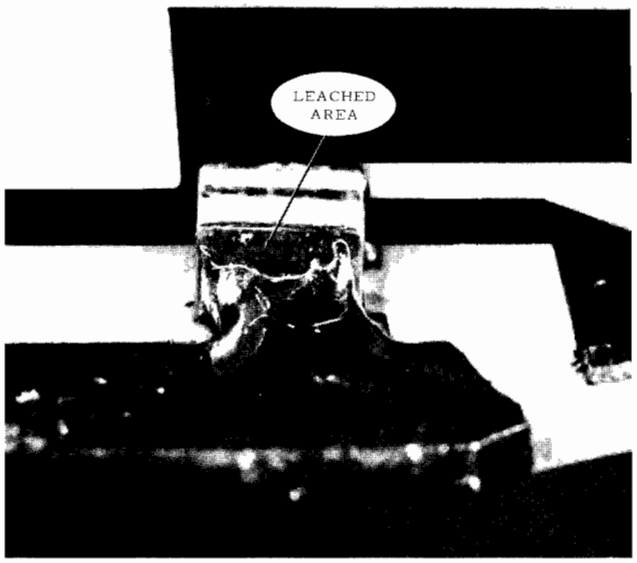

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Figure 1. Example of "Leached" Chip Component

2. CHIP COMPONENT REPAIR PROCEDURES

2.1 GENERAL

Table 1 lists the recommended tools to be used for removal and replacement of circuit board mounted chip components.

Table 1. Chip Component Servicing Tools

Type	Motorola Part Number	Minimum Specification
Heated Tweezers	1-80386A62	Temperature set at 550 °F
Soldering Iron	1-80382A44	Temperature Set at 550 °F
Tweezers	ST-492	1/16" Tips, minimum

2.2 CHIP COMPONENT REMOVAL

Chip components are very reliable. Care should be taken while troubleshooting to insure that the part in

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question is indeed defective before removal is undertaken. If a chip component is deemed defective, or is visibly damaged, it must be replaced. Several methods can be used to remove the defective part from the circuit board. The exact-method used depends upon the skill or experience of the technician, and the available service aids.

2.2.1 Heated Tweezers Method of Removal

A Heated Tweezers System (Motorola Part No. 1-80386A62) allows for easy chip component removal. The tweezers are first heated and then applied to both terminations of the chip component to be removed. After the solder is melted sufficiently, the chip components can be lifted from the circuit board. Refer to Figure 2.

NOTE

If the chip component does not easily lift up after the solder is melted, more heating time is required to soften the epoxy glue dots, which originally attached the part to the circuit board before it was soldered.

2.2.2 Two Soldering Irons Method of Removal

Two temperature controlled soldering irons (Motorola Part No. 1-80382A44) set at 550°F may be used to remove a defective chip component. This method is similar to the method described in the previous paragraph. Place the soldering irons, simultaneously, against each termination of the chip component to be removed. After heating sufficiently to melt the solder and the epoxy glue dots (as stated in the previous paragraph) lift the chip part, with the two soldering irons, off of the circuit board. Refer to Figure 3.

2.2.3 One Soldering Iron Method of Removal

Loosen the solder joints at the chip component end terminations by alternately applying enough heat with a single temperature controlled soldering iron to each joint until the solder just melts. As the solder reflows, use a pair of tweezers to twist the chip component to break the adhesive joints between the component body and the circuit board pads. Then, repeat heating if necessary, and remove the chip component.

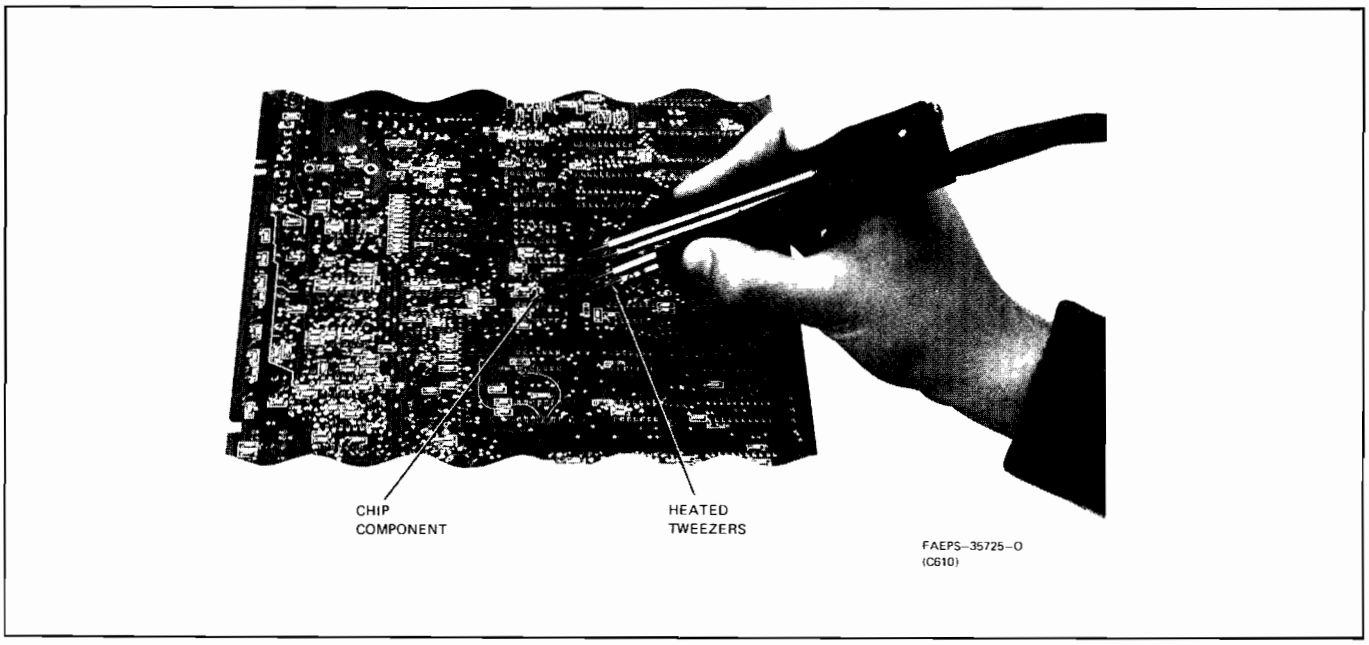

Figure 2. Removal of Chip Component Using a Heated Tweezers

2.3 CHIP COMPONENT TESTING

Once a chip diode, transistor, or resistor is removed from the circuit board it can be tested in the normal manner using any high quality ohmmeter. Chip capacitors, however, should not be reused since internal damage may still have occured when the part was removed. Chip capacitor damage may not be noticed when the part is tested at room temperature.

2.4 CHIP COMPONENT REPLACEMENT

CAUTION
The soldering instrument(s) temperature *must never* exceed 550 °F.

2.4.1 Circuit Board Preparation

Remove any excess solder from the foil location pads of the chip component by using a solder removal tool or solder braid. Any excess buildup of epoxy glue between the foil pads must also be removed to insure that the new chip component will solder properly into place. The circuit board is properly prepared when the chip component can be placed on the circuit board and the end terminations (tabs) of the chip make contact with the mounting foil. The chip should be flush with the circuit board at all points, and the foil pads should be clean and ready to accept solder.

2.4.2 Installation With Heated Tweezers

Step 1. Insure that the circuit board is prepared properly as discussed in the previous paragraph.

Step 2. Properly position (center) the new chip part on the circuit board foil pads.

Step 3. Heat the tweezers to 550 °F, and sparingly apply 60-40 tin-lead solder to the tabs of the chip part.

Step 4. Insure proper solder wetting at the tabs of the chip part and on the circuit board foils before removing the tweezers.

Step 5. Allow the chip part to cool.

Step 6. Visually inspect the chip part to insure that good solder wetting occured and no visible damage to the chip part exists.

2.4.3 Installation With Temperature Controlled Soldering Iron

Step 1. Insure that the circuit board is prepared properly as discussed in the previous paragraph.

Step 2. Properly position (center) the new chip part on the circuit board foils.

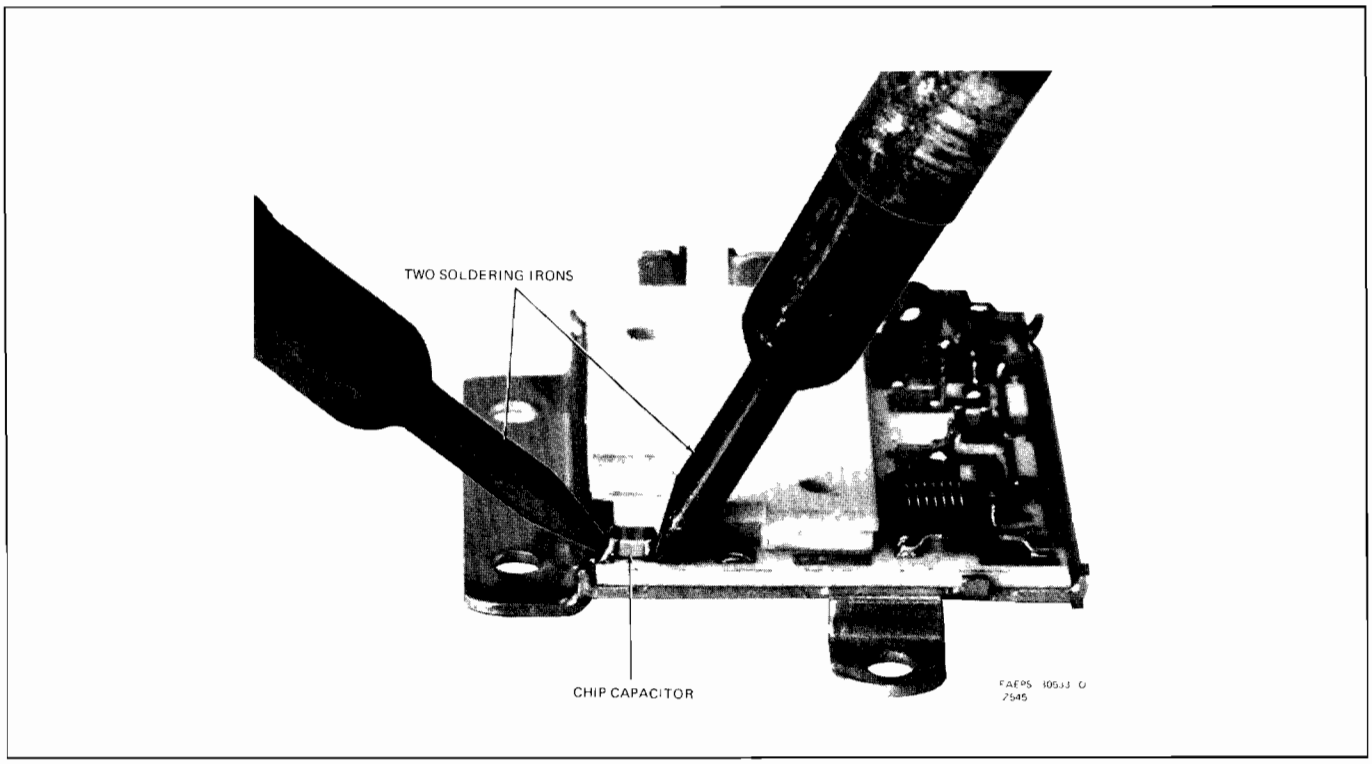

Figure 3. Removal of Chip Component with Two Soldering Irons

Step 3. Heat the soldering iron and apply a small amount of 60-40 tin-lead solder to the tip.

Step 4. Hold the chip part in place with a tweezers or a plastic tuning tool (with metal tip) while soldering one tab of the chip part to the circuit board foil.

Step 5. Insure proper solder wetting at the tab of the chip part being soldered and on the circuit board foil pads before removing the soldering iron.

Step 6. Allow the chip part to cool.

Step 7. Solder the remaining tab(s) of the chip part in the normal manner.

Step 8. Visually inspect the chip part to insure that good solder wetting occured and no visible damage to the chip part exists.

MOTOROLA INC.
Communications Sector

SAFE HANDLING OF CMOS INTEGRATED CIRCUIT DEVICES

Many of the integrated circuit devices used in communications equipment are of the CMOS (Complementary Metal Oxide Semiconductor) type. Because of their high open circuit impedance, CMOS ICs are vulnerable to damage from static charges. Care must be taken in handling, shipping, and servicing them and the assemblies in which they are used.

Even though protection devices are provided in CMOS IC inputs, the protection is effective only against overvoltage in the hundreds of volts range such as are encountered in an operating system. In a system, circuit elements distribute static charges and load the CMOS circuits, decreasing the chance of damage. *However, CMOS circuits can be damaged by improper handling of the modules even in a system.*

To avoid damage to circuits, observe the following handling, shipping, and servicing precautions.

1. Prior to and while servicing a circuit module, particularly after moving within the service area, momentarily touch *both* hands to a bare metal earth grounded surface. This will discharge any static charge which may have accumulated on the person doing the servicing.

NOTE
Wearing Conductive Wrist Strap (Motorola No. RSX-4015A) will minimize static buildup during servicing.

WARNING
When wearing Conductive Wrist Strap, be careful near sources of high voltage. The good ground provided by the wrist strap will also increase the danger of lethal shock from accidentially touching high voltage sources.

2. Whenever possible, avoid touching any electrically conductive parts of the circuit module with your hands.

3. Normally, circuit modules can be inserted or removed with power applied to the unit. However, check the INSTALLATION and MAINTENANCE sections of the manual as well as the module schematic diagram to insure there are no objections to this practice.

4. When servicing a circuit module, avoid carpeted areas, dry environments, and certain types of clothing (silk, nylon, etc.) because they contribute to static buildup.

5. All electrically powered test equipment should be grounded. *Apply* the *ground lead* from the test equipment to the circuit module *before* connecting the *test probe*. Similarly, *disconnect* the *test probe prior* to removing the *ground lead.*

6. If a circuit module is removed from the system, it is desirable to lay it on a conductive surface (such as a sheet of aluminum foil) which is connected to ground through 100k of resistance.

WARNING
If the aluminum foil is connected directly to ground, be cautious of possible electrical shock from contacting the foil at the same time as other electrical circuits.

7. When soldering, be sure the soldering iron is grounded.

8. Prior to connecting jumpers, replacing circuit components, or touching CMOS pins (if this becomes necessary in the replacement of an integrated circuit device), be sure to discharge any static buildup as described in procedure 1. Since voltage differences can exist across the human body, it is recommended that only one hand be used if it is necessary to touch pins on the CMOS device and associated board wiring.

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9. When replacing a CMOS integrated circuit device, leave the device in its metal rail container or conductive foam until it is to be inserted into the printed circuit module.

10. All low impedance test equipment (such as pulse generators, etc.) should be connected to CMOS device inputs after power is applied to the CMOS circuitry. Similarly, such low impedance equipment should be disconnected before power is turned off.

11. Replacement modules shipped separately from the factory will be packaged in a conductive material. Any modules being transported from one area to another should be wrapped in a simlar material (aluminum foil may be used). NEVER USE NON-CONDUCTIVE MATERIAL for packaging these modules.

UHF *MCX100* RADIO ALIGNMENT

1. INTRODUCTION

Alignment of the UHF *MCX100* radio consists of four procedures which should be performed in the following sequence:

- receiver alignment
- transmitter alignment
- oscillator frequency adjustment
- deviation adjustment

2. RECOMMENDED TEST EQUIPMENT

Refer to the following table which lists the test equipment which should be used for performing the procedures presented in this manual.

*Recommended Test Equipment for **MCX100** Radio Servicing*

General Type	Application	Recommended Model	Minimum Specifications
AC-DC VOM	DC voltage measurements, general	Motorola T1010 or R1026	Measurement range: 0-15 V dc Sensitivity: 20,000 ohms/volt
DC Multimeter	DC voltage readings requiring a high input resistance meter	Motorola S1063	Measurement range: 0-15 V dc Input resistance: 11 megohms
AC Voltmeter	Audio voltage measurements	Motorola S1053	Measurement range: 0-10 V ac Input resistance: 10 megohms
RF Voltmeter	RF voltage measurements	Motorola S1339	Measurement range: 100 uV-3 V from 1 MHz-512 MHz Inputs: 50 ohm & high impedance
Tuning Probe Adapter	Single & Dual Front End Alignment	Motorola TRN4778	
Oscilloscope	Waveform observation	Motorola R1028 or R1029	Vertical sensitivity: 5 mV-10 V/division Horizontal time base: 0.2 usec.-0.5 sec/division
RF Wattmeter	Transmitter output power measurement	Motorola S1350 w/appropriate element & T1013 RF dummy load	Measurement range: 0-250 watts
Frequency Meter	Transmitter frequency measurement	Model R1200 Service Monitor w/high stability oscillator (X suffix) option. Frequency calibration recommended every 6 months or less.	Measurement range: 403-512 MHz frequency resolution: 10 Hz
Deviation Meter	Transmitter modulation deviation measurement	Motorola R1200 Service Monitor w/ RTC4000 Deviation Meter and SLN6381 Audio Frequency Synthesizer (audio synthesizer required only for DPL radios).	Measurement range: 0 to + /-10 kHz deviation Frequency range: 402-512 MHz
RF Signal Generator	Receiver alignment and troubleshooting	Motorola R1200 Service Monitor w/attenuator	Frequency range: 403-512 MHz Output Level: 0.1 uV 1.0 V Must be capable of at least ±3 kHz deviation when modulated by 1 kHz tone.
Audio Signal Generator	Audio circuit troubleshooting	Motorola S1067	Frequency range: 20 Hz-20 kHz Output level: 50 mV-1 V
PL Tone Generator (Note 1)	Tone coded *Private-Line* decoder troubleshooting	Motorola R1100	Frequency range: 10 Hz-9999 Hz Output level:0-3 V rms

*Recommended Test Equipment for **MCX100** Radio Servicing (Cont'd.)*

General Type	Application	Recommended Model	Minimum Specifications
DPL Test (Note 2)	*Digital Private-Line* encoder-decoder troubleshooting	Motorola SLN6413	
Standard Test Receiver	*Digital Private-Line* modulation adjustment	Motorola R1200 Service Monitor	
Speaker/Load	Receiver alignment & measurement	TSN6031A Speaker Kit w/ RPX4134A Modulation Kit	
Tuning Tool Kit	Receiver & Transmitter Alignment	Motorola TRN4671A	
DC Power Supply	DC power for shop service	Motorola R1011	1-20 V dc 0-40 A
Front Panel Extender Cables	Troubleshooting	Motorola RTK4036A	
Metric Nutdriver Kit	Radio Assembly/Disassembly	RSX4048A	

Notes:
1. Required for tone-coded *Private-Line* models only.
2. Required for *Digital Private-Line* models only.

NOTE

All test equipment, with the exception of the DPL test set, tuning tool kit, tuning probe adaptor, dc power supply, front panel extender cables, and nut driver set may be replaced by the Motorola R2001 System Analyzer.

3. RECEIVER ALIGNMENT

3.1 440-470 MHZ (RANGE 3) RF DECK ALIGNMENT (SINGLE FRONT END)

Step 1. Using a screw driver, carefully turn the slugs of coils L701, L702, L703, L707, L708, and L709 clockwise (inward) until the adjusting screws are flush with the torque nuts on the rf deck housing. (Refer to Figure 1. for coil locations.)

Step 2. Set the channel selector switch to any channel programmed into the radio.

Step 3. Connect an ac voltmeter across the audio output of the radio set. The audio output must be terminated in either the recommended 2-ohm speaker/audio load (refer to test equipment list) or a 2-ohm resistor.

Step 4. Depress the squelch button and monitor button (if used), so that noise is heard in the speaker (if used). The meter across the 2-ohm load indicates noise level.

Step 5. Adjust the volume control until a comfortable noise level is reached. If a 2-ohm load is used, adjust the volume control for an indication of approximately 1 volt across the load.

Step 6. Adjust L5 (quad coil) until maximum noise level is obtained from the speaker, or the highest reading on the voltmeter is obtained. (See Figure 1 for L5 location.)

Step 7. Refer to label on the cover (inside) of the radio for the tune-up frequency. If the label is not supplied or is missing, contact your Motorola representative for information. The tune-up frequency is not necessarily the midpoint of the frequency range.

Step 8. Connect an rf signal generator to the antenna connector (through a 6 dB attenuator). Set the rf generator to the tune-up frequency, and set the generator output level to +5 dBm (398 mV).

Step 9. Press the tuning probe adaptor (Motorola No. TRN4778) onto the probe of the rf voltmeter as shown in Figure 2.

Step 10. Place the radio into the position shown in Figure 1 and insert the tuning probe into the input filter (INPUT FLTR) metering point. Connect the ground clip to the radio chassis.

Step 11. Hold the probe in position and adjust L701 out (counterclockwise) until reading is obtained on the voltmeter.

Step 12. Adjust L702 until a dip in the voltmeter reading is obtained.

Step 13. Decrease signal generator output to -10 dBm (71 mV). Insert tuning probe into high range filter (HI RNG FILTER) metering point as shown in Figure 1.

Step 14. Adjust L707 for a peak voltmeter reading.

Step 15. Adjust L703 for a peak voltmeter reading.

Step 16. Re-adjust L707 for a peak voltmeter reading.

Step 17. Adjust L708 for a dip in voltmeter reading.

Step 18. Adjust L709 for a peak voltmeter reading.

Step 19. Re-tune L703 for a peak voltmeter reading.

Step 20. Remove the 6 dB attenuator from the signal generator output. The rf deck is now aligned. Continue with Receiver Adjustments paragraph 3.4.

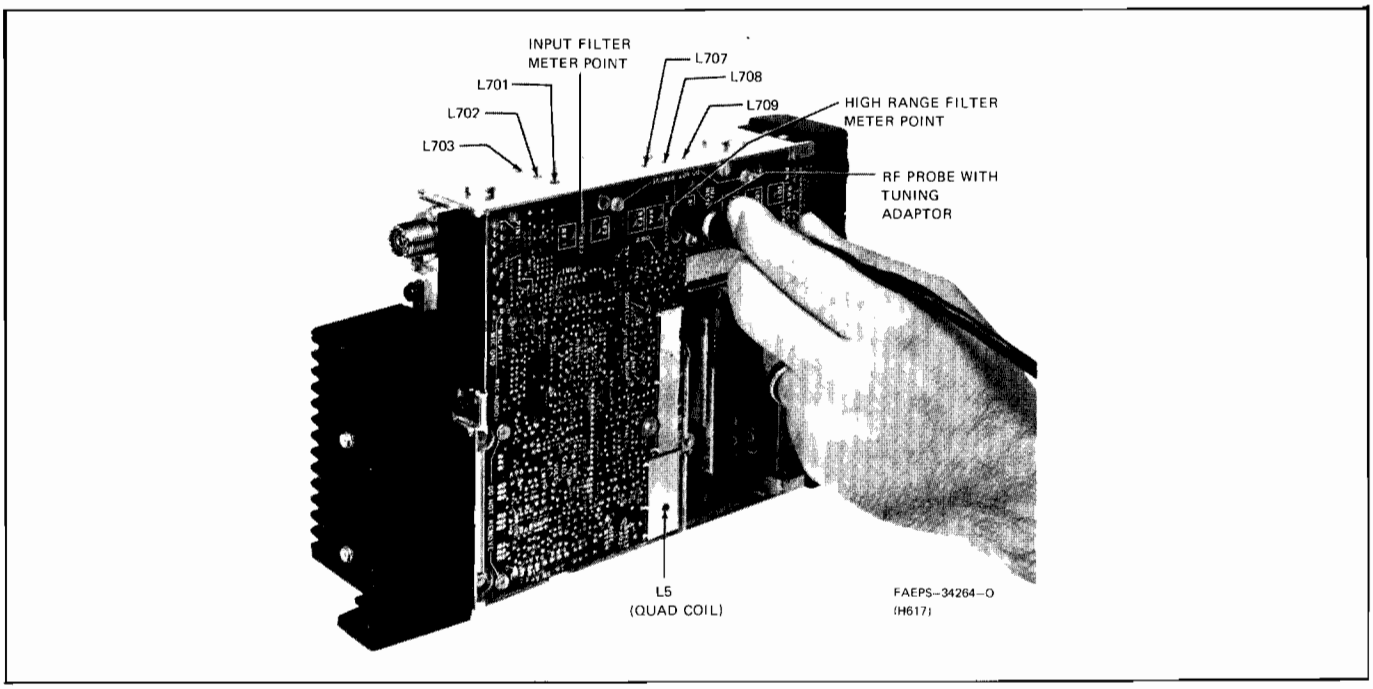


Figure 1. Main Board Side Tuning Probe Positions

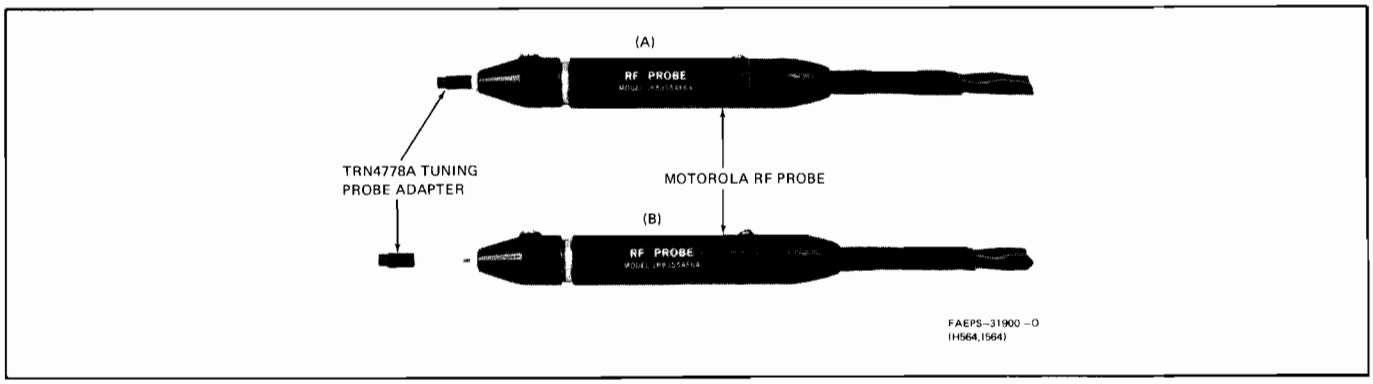


Figure 2. MCX100 Alignment Probe (A) RF Probe with Tuning Adaptor in position (B) RF Probe and Tuning Adaptor separated

3.2 440-470 MHZ (RANGE 3) RF DECK ALIGNMENT (DUAL FRONT END)

Step 1. Carefully turn the slugs of the nine rf deck coils (L701 through L709) clockwise until the adjusting screws are flush with the torque nut on the rf deck housing. (Refer to Figure 3 for L701-709 locations.)

Step 2. Set the channel selector switch to the highest frequency channel programmed into the radio.

Step 3. Connect an ac voltmeter across the audio output of the radio set. The audio output must be terminated in either the recommended 2-ohm speaker/audio load (refer to test equipment list) or a 2-ohm resistor.

Step 4. Depress the squelch button and monitor button (if used), so that noise is heard in the speaker (if used). The meter across the 2-ohm load indicates noise level.

Step 5. Adjust the volume control until a comfortable noise level is reached. If a 2-ohm load is used, adjust the volume control for an indication of approximately 1 volt across the load.

Step 6. Adjust L5 (quad coil) until maximum noise level is obtained from the speaker, or the highest reading on the voltmeter is obtained. (Refer to Figure 1 for L5 location.)

Step 7. Refer to label on the cover (inside) of the radio for the three tune-up frequencies. If the label is not supplied or is missing, contact your Motorola representative for information.

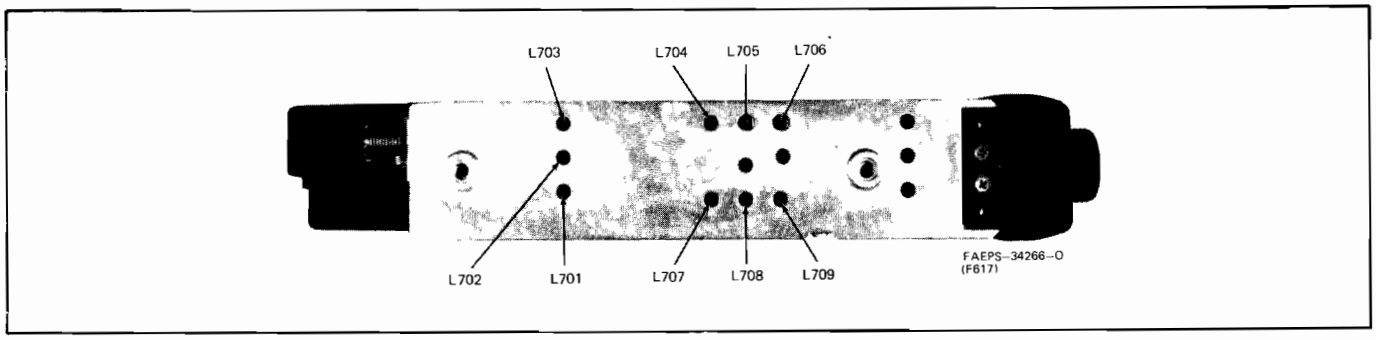


Figure 3. Dual Front End Alignment Points

Step 8. Connect the rf signal generator to the antenna connector (through a 6 dB attenuator). Set the rf generator to the input filter tune-up frequency, and set the generator output level to +5 dBm (398 mV).

Step 9. Press the tuning probe adaptor (Motorola No. TRN4778) onto the probe of the rf voltmeter as shown on Figure 2.

Step 10. Place the radio into the position shown in Figure 1, and insert the tuning probe into the input filter (INPUT FLTR) metering point. Connect the ground clip to the radio chassis.

Step 11. Hold the probe in position and adjust L701 out (counterclockwise) until a peak reading is obtained on the voltmeter.

Step 12. Adjust L702 until a dip in the voltmeter reading is obtained.

Step 13. Change the signal generator output to high filter tune-up frequency, and move meter probe to high range filter (HI RNG FLTR) metering point as shown in Figure 1.

Step 14. Decrease the signal generator output to -10 dBm (71 mV). Adjust L707 for a peak reading on the voltmeter.

Step 15. Adjust L703 for a peak voltmeter reading. If a peak cannot be obtained, set the tuning slug so that L703 and 702 tuning slugs are approximately at the same height with respect to the torque nut.

Step 16. Re-adjust L707 for a peak voltmeter reading.

Step 17. Adjust L708 for a dip in voltmeter reading.

Step 18. Adjust L709 for a peak voltmeter reading.

Step 19. Re-adjust L703 for a peak voltmeter reading.

Step 20. Set the radio channel selector to lowest receive frequency.

Step 21. Set the rf signal generator to low filter tune-up frequency.

Step 22. Place the radio into the position shown in Figure 4, and insert the tuning probe into the low filter metering point. Connect the ground clip to the radio chassis.

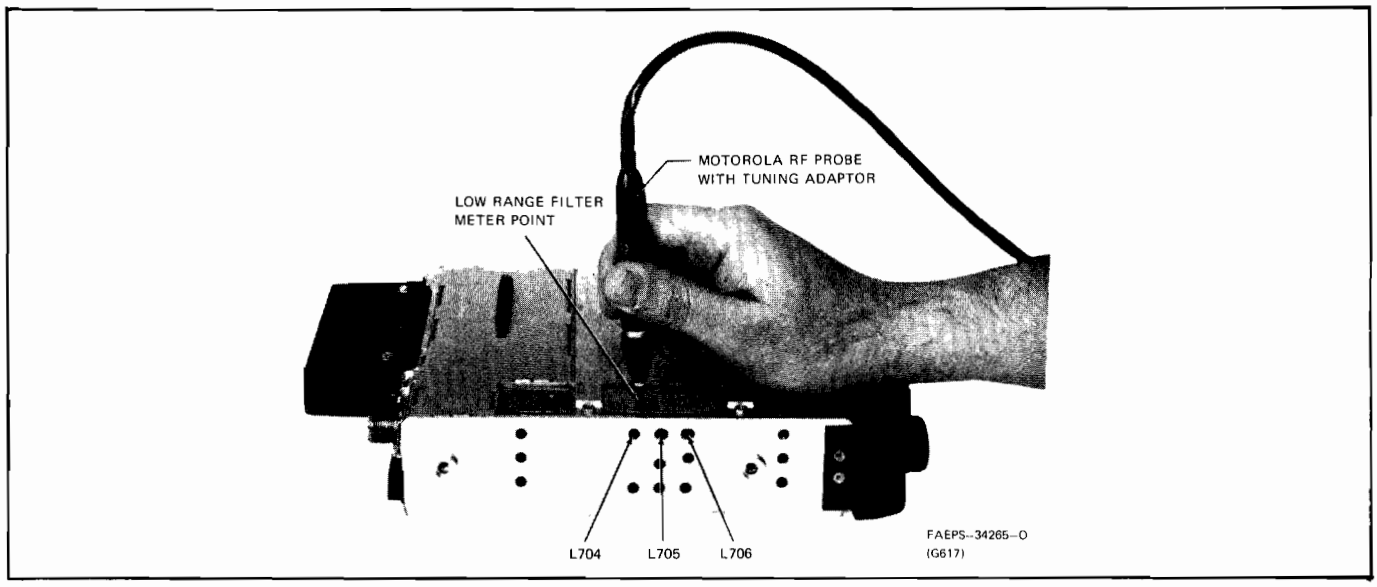


Figure 4. Low Filter Tuning.

Step 23. Adjust L704 out for a peak voltmeter reading.

Step 24. Adjust L705 for a dip in voltmeter reading.

Step 25. Adjust L706 for a peak voltmeter reading.

Step 26. Remove the 6 dB attenuator from the rf signal generator output. The rf deck is now aligned. Continue with Receiver Adjustments paragraph 3.4.

3.3 OSCILLATOR FREQUENCY ADJUSTMENT (See Figure 5.)

CAUTION

Make sure the radio antenna connector (J300) is terminated into 50 ohms.

Step 1. Set the channel selector switch to channel 1.

Step 2A. (For PL/DPL units only.) Disconnect connector J377 from the PL/DPL board to disable the encoder modulation. Key the transmitter to generate an unmodulated carrier.

Step 2B. (For other units.) Key the transmitter to transmit an unmodulated carrier.

Step 3. Adjust reference oscillator warp adjustment until the proper frequency indication ±100 Hz is obtained.

NOTE

If Step 3 cannot be performed do to insufficent transmitter power output, perform Steps 1,2 and 3 of section 4.1. Then repeat Step 3 above.

Step 4. Set the channel selector switch to channel 2 and check the transmit frequency.

Step 5. Repeat the procedure until all the channels have been checked.

Step 6. Once the oscillator frequency adjustment procedure has been completed, reconnect J377 if it was disconnected in Step 2A.

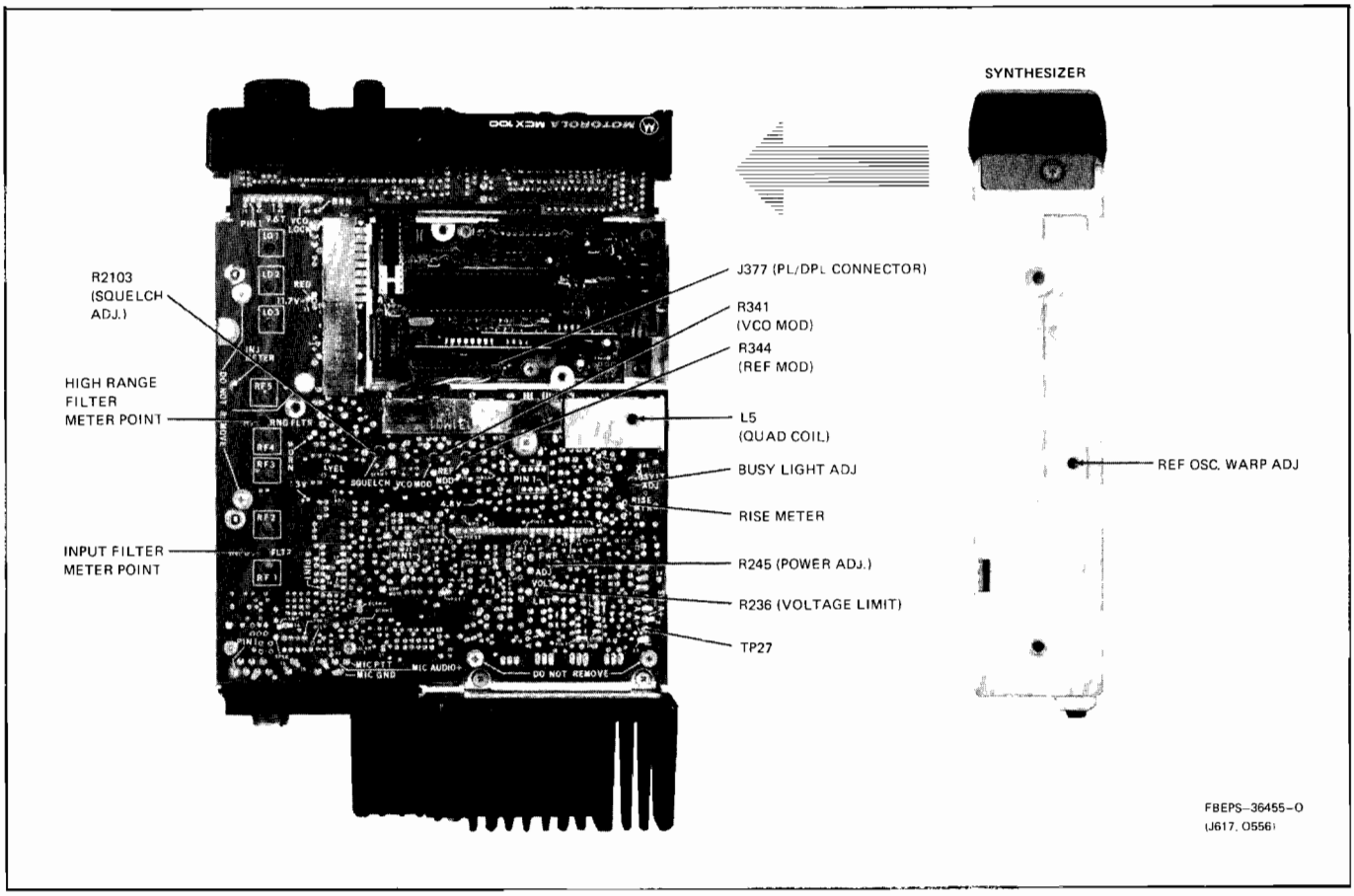


Figure 5. MXC100 Radio Alignment Test Points

3.4 RECEIVER ADJUSTMENTS
(Refer to Figure 5 for adjustment locations.)

Step 1. Set the signal generator to provide an output of 1 mV with 1 kHz modulation at 60 percent of the full rated system deviation. With the volume control set for a comfortable listening level, very slowly adjust L5 (quad coil) until a maximum tone level is obtained from the speaker (or a maximum indication across a 2-ohm load, if such a load is used).

Step 2. Set the generator to provide an unmodulated, on-frequency output signal that causes 10 dB of noise quieting (with a 1 Vac noise reference).

Step 3. Turn R2103 (SQUELCH ADJ. potentiometer) fully counterclockwise and set the squelch pushbutton on the front panel to the OUT position.

Step 4. Turn R2103 clockwise until the speaker noise mutes; then *very slowly* turn it counterclockwise until the speaker noise just stays unmuted.

Step 5. Reduce the signal generator output level to zero and then *very slowly* increase it until the speaker unmutes. Verify that the noise quieting (at squelch opening) is between 9 and 11 dB.

Step 6. (For PL/DPL or *Select 5* radio sets only.) Using the signal generator, apply an on-frequency, unmodulated output signal that produces 23 dB of noise quieting. Adjust R1202 (BUSY LIGHT ADJ. potentiometer) until the busy light on the front panel just turns on.

Step 7. Check radio on all channels for 20 dB quieting sensitivity. The quieting level should not exceed 0.35 uV on any channel.

Table 1. Power Amplifier Adjustments

Specification	Power Rating (Watts)	Power Level (Watts)	Maximum Minimum	Supply Voltage (Volts)
FTZ	6.0	6.0	maximum	12.60
CEPT	10.0	10.0	minimum	13.20
CEPT	25.0	25.0	minimum	13.20
CEPT	30.0	30.0	minimum	13.20
EIA/DOC	10.0	11.0	minimum	13.80
EIA/DOC	30.0	31.0	minimum	13.60
PGD	25.0	25.0	maximum	13.80
PGD	10.0	10.0	maximum	13.80
JRRB	10.0	10.0	maximum	13.80
JRRB	30.0	30.0	maximum	13.60

4. TRANSMITTER ALIGNMENT

Refer to Figure 5 for the various test points referred to in the following procedure.

4.1 POWER LEVEL ADJUSTMENT

CAUTION

Receiver alignment must be completed before power level adjustments.

NOTE

Key the radio ONLY while making an adjustment. The adjustments should be done at the appropriate supply voltage level specified in Table 1.

Step 1. Preset R236 (voltage limit potentiometer) by turning it fully clockwise. Preset R245 (power adjust potentiometer) by turning it fully counterclockwise.

Step 2. Refer to Table 1 and find the power set level which corresponds to the specification and power rating of the unit being adjusted.

Step 3. Select any transmit channel. Key the radio and adjust R245 (power adjust potentiometer) for the power set level determined in Step 2.

Step 4. Switch through all the transmit channels and record the channel which gives the maximum or minimum power level, as specified in Table 1.

Step 5. Switch through all the transmit channels while observing the dc voltage indication at TP27 (P351-2). Record the voltage level and channel for the channel that gives the highest voltage level. If this voltage level is greater than 9 V dc, proceed to step 8, do not perform steps 6 and 7.

Step 6. On the channel with the highest voltage level found in Step 5, turn R236 fully counterclockwise and R245 fully clockwise.

Step 7. Adjust R236 for a DC voltage level at TP27 that is 3 volts higher than the level recorded in Step 5.

Step 8. Switch to the channel that was determined in Step 4 and repeat Step 3 on this channel.

Step 9. Verify that all the transmit channels have the proper output power level.

4.2 DEVIATION ADJUSTMENT

NOTE

It is important that deviation be checked on all the transmit channels to ensure that no over-deviation occurs on any channel.

Refer to Table 2. Determine the type of radio and perform the indicated steps.

Table 2.

Radio Type	Steps
Carrier Squelch	1 thru 8 and 12.
PL	1 thru 10 Repeat 3, 8, 9, and 10 12.
DPL	1 thru 9, 11. Repeat 3, 8, 9, and 11 12.
Selectable PL/DPL or Selectable DPL	Select any DPL code 1 thru 9, 11. Repeat 3, 8, 9, and 11 12.
Selectable PL	Select the lowest PL tone frequency, 1 thru 10. Repeat 3, 8, 9, and 10 12.

Step 1. Set the channel selector switch to any available channel on the radio set.

Step 2. Turn R344 (REF MOD potentiometer) to a mid-position setting.

Step 3. Connect the audio oscillator output leads to the microphone audio input, as explained below:

- hot lead to J350-12
- ground lead to J350-11.

Step 4. Set the audio oscillator to 1000 Hz and adjust its output level to 800 mVrms.

Step 5. Using the appropriate rf load, key the transmitter and observe the deviation level. Readjust audio oscillator level per Step 4 if necessary.

Step 6. Adjust R341 (VCO MOD potentiometer) until the rated system deviation level is obtained. (See Table 3.)

NOTE

For PL/DPL radios, DO NOT defeat PL and/or DPL encoder output.

Table 3. System Deviation Settings

Channel Spacing	Main Board Kit No.	Deviation
25 or 30 kHz	TRN5521A	4.6 kHz
20 kHz	TRN5523A	3.7 kHz
12.5 kHz	TRN5522A	2.2 kHz
Japan	TRN5524A	4.8 kHz

Step 7. Set the radio set to the other transmit channels and record the deviation level obtained on each. Make a note of the channel having the highest deviation level. If more than one channel produces the same maximum deviation level, note the channel with the highest frequency among those having the maximum deviation level.

Step 8. Set the radio to the channel noted in Step 7. Adjust R341 (VCO MOD potentiometer) to obtain the correct deviation shown in Table 3.

Step 9. (For PL/DPL models only). Disconnect the audio oscillator. From the recorded data of Step 7, calculate the average level of deviation for all the transmit channels. Select a channel with PL (for PL radios) or DPL (for DPL radios) that has an average level of deviation. If more than one channel has an average level of deviation, select the higher frequency channel.

Step 10. (PL models only) Adjust R344 (REF MOD potentiometer) to obtain a 600 Hz deviation level.

Step 11. (DPL models only) Connect a direct-coupled input lead of an oscilloscope to the digital output of a standard test receiver. Adjust the REF MOD potentiometer (R344) until the best eye pattern symmetry is obtained. Refer to Figure 6. Check all other channels equipped with DPL and verify that all the eye patterns are similar.

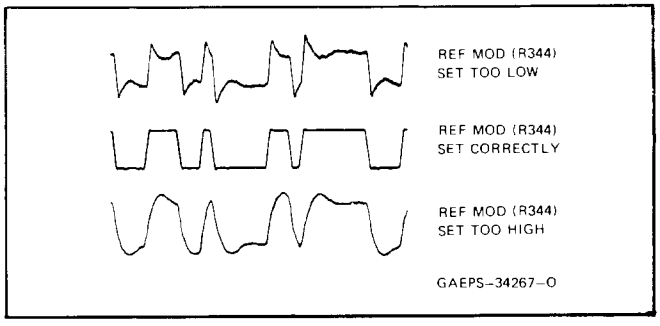
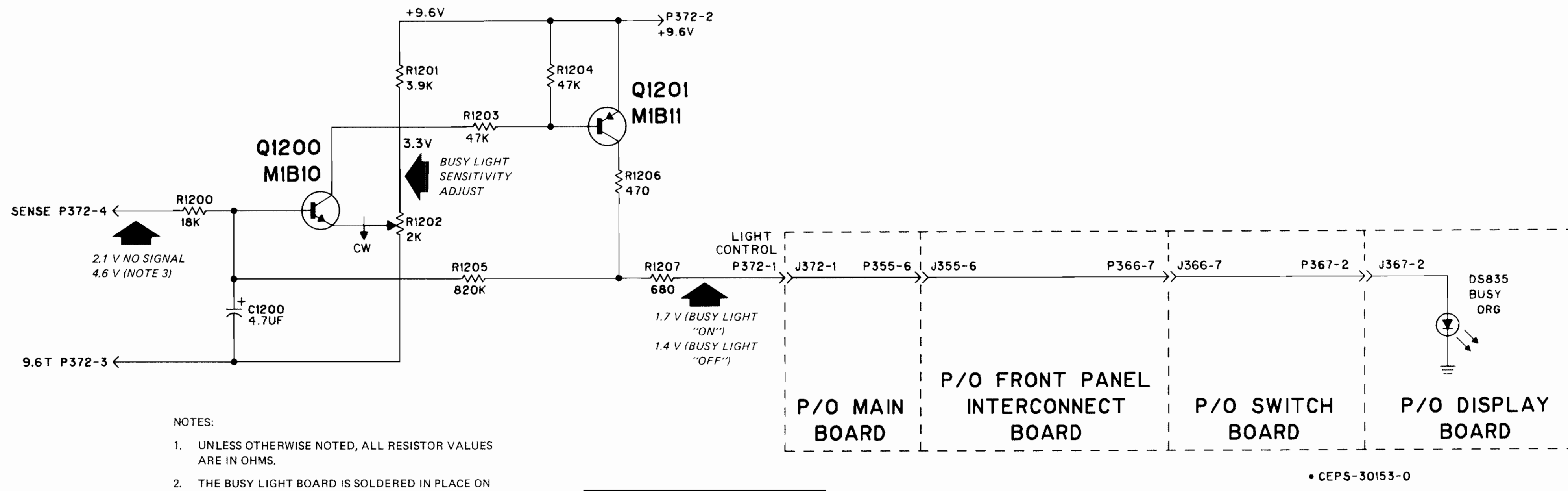


Figure 6. Examples of "Eye Pattern" Symmetry

Step 12. Check the deviation level on all the transmit channels and verify that it does not exceed the limits given in Table 3.

Note: The German-language section on UHF Alignment is omitted.

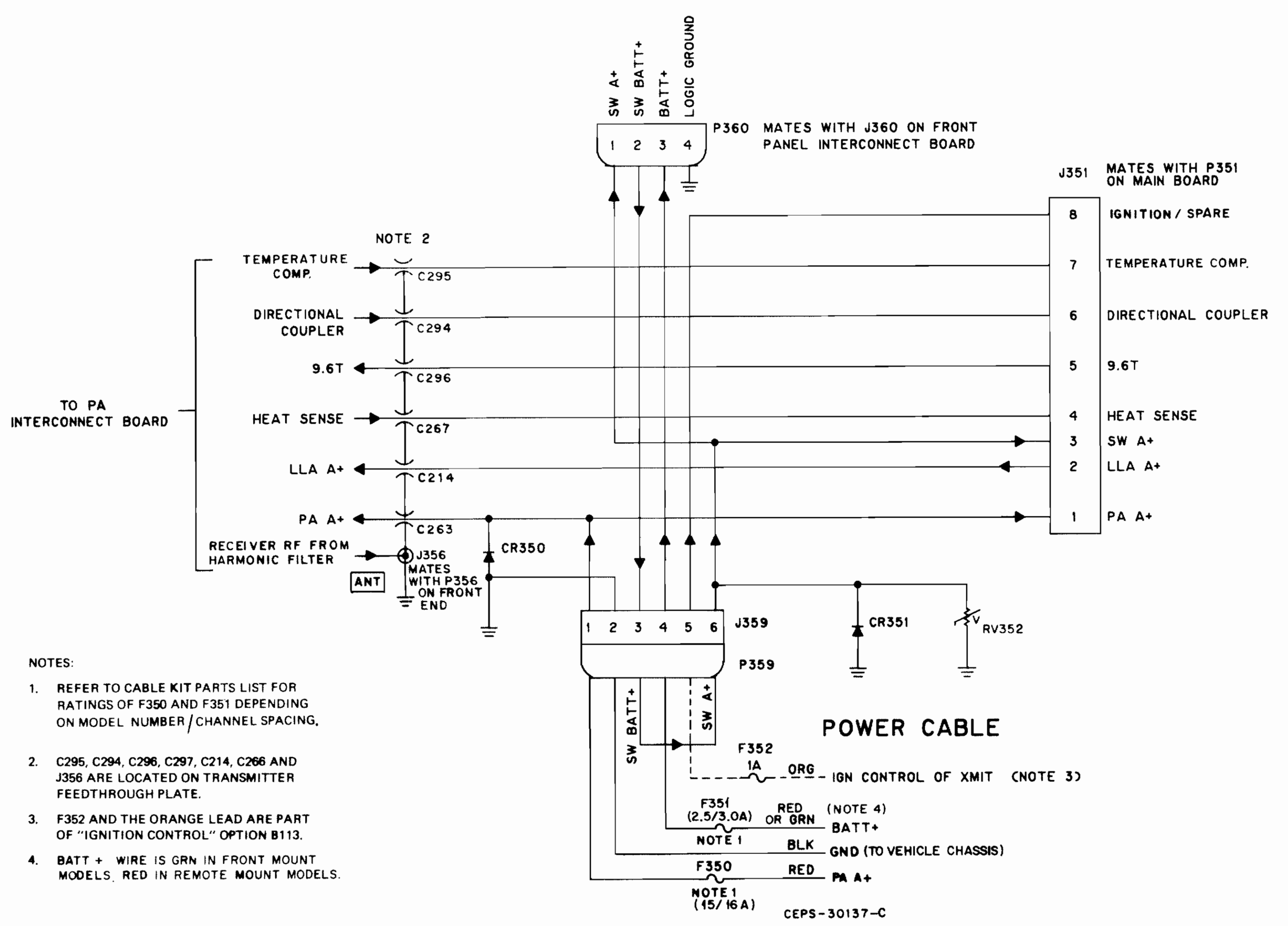
BUSY LIGHT

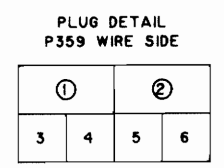


NOTES:

1. UNLESS OTHERWISE NOTED, ALL RESISTOR VALUES ARE IN OHMS.
2. THE BUSY LIGHT BOARD IS SOLDERED IN PLACE ON THE MAIN BOARD AT THE FOUR CONNECTION POINTS.
3. VOLTAGE MEASURED WITH −50 DBM ON-CHANNEL, UNMODULATED SIGNAL AT THE ANTENNA INPUT VOLTAGES ARE TYPICAL.

POWER INTERCONNECT BOARD AND POWER CABLE





NOTES:

1. REFER TO CABLE KIT PARTS LIST FOR RATINGS OF F350 AND F351 DEPENDING ON MODEL NUMBER / CHANNEL SPACING.
2. C295, C294, C296, C297, C214, C266 AND J356 ARE LOCATED ON TRANSMITTER FEEDTHROUGH PLATE.
3. F352 AND THE ORANGE LEAD ARE PART OF "IGNITION CONTROL" OPTION B113.
4. BATT + WIRE IS GRN IN FRONT MOUNT MODELS. RED IN REMOTE MOUNT MODELS.

parts list

TRN5521A Main Board, 25/30 kHz
TRN5522A Main Board, 12.5 kHz
TRN5523A Main Board, 20 kHz
TRN5524A Main Board, Japan — PL-8267-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed: uF ± 10%; 50 V: unless otherwise stated
C1 thru 3	21-11021E25	.002
C4	21-11022G34	15 pF ± 5%
C5 thru 11	21-11021E25	.002
C12	21-11022G34	15 pF ± 5%
C13	21-11022G25	8 pF ± 0.5 pF
C14	21-11021E26	.005
C15	21-11021E25	.002
C16	21-82450B33	0.56 pF ± 5%; 500 V
C17	21-00020M26	150 pF ± 5%; 100 V
C18, 19	21-11021E25	.002
C20	21-11022G27	9 pF ± 0.5 pF (TRN5524A only)
C21	21-11021E26	.005
C22	21-11021E25	.002
C23	21-11021E09	470 pF
C24, 25	21-82450B33	0.56 pF ± 5%; 500 V (TRN5521A, TRN5523A, TRN5524A)
C26	21-11022G05	1.5 pF ± 0.25 pF (TRN5524A only)
C27, 28	21-11021E25	.002
C29	21-11022G34	15 pF ± 5%; (TRN5524A only)
C50, 51	23-11019A26	22 ± 20%; 16 V
C52		NOT USED
C53	21-11021E09	470 pF
C54	8-11023B09	.0047
C55	8-11023B03	.0015
C56	23-11019A09	1 ± 20%
C57, 58	23-11019A26	22 ± 20%; 16 V
C59	8-11023B17	.022
C60	23-11019A26	22 ± 20%; 16V
C61, 62	21-11022M42	100 pF ± 5%
C63	23-83210A19	500 + 100-10%; 20 V
C64	8-11023B17	.022
C65	23-84613M02	22 ± 20%; 25 V
C66, 67	21-11022M42	100 pF ± 5%
C68	8-84637L22	0.22; 100 V
C69,70	23-11019A26	22 ± 20%; 16V
C225, 226	21-11022M42	100 pF ± 5%
C227	23-11019A26	22 ± 20%; 16 V
C228	8-11023B13	.01
C229	8-11023B23	.068
C230	8-11023B09	.0047
C300	23-11019A26	22 ± 20%
C301	21-11022M42	100 pF ± 5%
C302	21-11021E25	.002
C303	23-84613M02	22 ± 20%; 25 V
C304	8-11023B13	.01
C305	23-84613M03	47 ± 20%; 16 V
C306	21-11022M42	100 pF ± 5%
C307	23-84613M02	22 ± 20%; 25 V
C325	21-11022M42	100 pF ± 5%
C326	8-11023A11	.0068 ± 5%
C327	23-11019A09	1 ± 20%
C328	8-11023B01	.001
C329	8-11023B05	.0022
C330	21-00020M26	150 pF ± 5%; 100 V (TRN5524A only)
	or 21-11022G52	80 pF ± 5%; (TRN5521A, TRN5522A, TRN5523A)
C331	23-11019A45	100 ± 20%; 16 V
C332	21-11022M42	100 pF ± 5%
C333	8-11023B18	.027 (TRN5521A, TRN5522A, TRN5523A)
C334	21-11025A01	.01 ± 20%; 25 V
C335, 336	23-11019A26	22 ± 20%; 16 V
C2100	8-11023B21	.047
C2101	23-11019A09	1 ± 20%
C2102	8-11023B01	.001
C2103	8-11023B09	.0047
C2104, 2105	21-11022M42	100 pF ± 5%
C2106	23-11019A26	22 ± 20%; 16 V
C2107	8-11023B17	.022
C2108	23-11019A07	0.47
C2109	23-11019A09	1 ± 20%
C2110	8-11023B13	.01 (TRN5521A, TRN5523A, TRN5524A)
		diode: (see note)
CR50, 51	48-84399M01	silicon
CR52, 53	48-83654H02	silicon
CR225 thru 229	48-84399M01	silicon
CR300	48-84399M01	silicon
CR301		NOT USED
CR302 thru 305	48-84399M01	silicon
CR325	48-84399M01	silicon
CR2102 thru 2106	48-84399M01	silicon
CR2107, 2108	48-83654H01	silicon
		connector, receptacle:
J350	1-80731D28	assembly, 14-contact
J380	28-84318M10	male; 4-contact
		coil, rf:
L1 thru 4	24-82723H35	choke; 23 uH
L5	24-84972A57	8-1/2 turns coded GRN
L6,7	24-82723H35	choke; 23 uH
L50	24-82190C15	choke;1.2 uH
L325	24-82415N02	choke; 10 mH (TRN5521A, TRN5522A, TRN5523A)
		connector, plug:
P351	28-82647K03	male, 8-contact
P352	28-84318M01	male, 22-contact
P355	28-82502M04	male, 12-contact
		transistor: (see note)
Q1, 2	48-869839	field-effect, type M9839
Q50, 51, 52	48-02081B11	PNP; type M1B11
Q53	48-02081B10	NPN; type M1B10
Q54	48-869807	PNP; type M9807
Q55	48-02081B10	NPN; type M1B10
Q56	48-869806	NPN; type M9806
Q57	48-02081B11	PNP; type M1B11
Q58	48-02081B10	NPN; type M1B10
Q225	48-84411L10	PNP; type M1110
Q226	48-02081B10	NPN; type M1B10
Q227	48-02081B11	PNP; type M1B11
Q300	48-869807	PNP; type M9807
Q301	48-02081B10	NPN; type M1B10
Q302	48-869641	PNP; type M9641
Q303, 305 thru 308	48-02081B10	NPN; type M1B10
Q325	48-02081B11	PNP; type M1B11
Q326	48-02081B10	NPN; type M1B10
Q2100 thru 2103	48-02081B10	NPN; type M1B10
		resistor, fixed ± 5%; 1/4 W: unless otherwise stated
R1	6-11020A29	150
R2	6-11020A47	820
R3	6-11020A49	1k
R4	6-11020A29	150
R5	6-11020A35	270
R6,7	6-11020A47	820
R8	6-11020A43	560
R9	6-11020A35	270
R10	6-11020A85	33k
R11	6-11009C71	8.2k
R12	6-11020A65	4.7k (TRN5524A only)
R13	6-11020A35	270 (TRN5524A only)
R14	6-11020A65	4.7k (TRN5524A only)
R50	6-11020A57	2.2k (TRN5522A only)
	or 6-11020A61	3.3k (TRN5523A only)
	or 6-11020A65	4.7k (TRN5521A, TRN5524A)
R51	6-11020A83	27k
R52	6-11020A75	12k
R53	6-11020A91	56k
R54	6-11020B02	150k
R55	6-11020B18	680k
R56	6-11020A71	8.2k
R57	6-11020B14	470k
R58, 59	6-11020A73	10k
R60	6-11020A43	560
R61, 62	6-11020A89	47k
R63	6-11020A87	39k
R64	6-11020A97	100k
R65	6-11020A81	22k
R66	6-11020A73	10k
R67	6-11020A61	3.3k
R68	6-11020A29	150
R69	6-11020A49	1k
R70, 71	6-11020A43	560
R72	6-11020A35	270
R73	6-11020A79	18k
R74	6-11020A29	150
R75	6-11020A91	56k
R76	6-11020A57	2.2k
R77	6-11020A65	4.7k
R78, 79	17-82036G59	0.18 ± 10%; 1 W
R225	6-11020A25	100
R226	6-11020A49	1k
R227	6-11020A25	100
R228	6-11020A65	4.7k
R229	6-11020A67	5.6k
R230	6-11020A61	3.3k
R231	6-11020A73	10k
R232	6-11020A47	820
R233	6-11020A59	2.7k
R234	6-11020A75	12k
R235	6-11020A71	8.2k
R236	18-84944C02	variable; 25k ± 20%
R237, 238	6-11020A77	15k
R239	6-11020A73	10k
R240	6-11020A85	33k
R241	6-11020A89	47k
R242	6-11020A63	3.9k
R243	6-11020A81	22k
R244	6-11020A75	12k
R245	18-84944C02	variable; 25k ± 20%
R246	6-11020A72	9.1k
R247	6-11020A57	2.2k
R300	6-11020A53	1.5k
R301	6-11020A37	330
R302	6-11020A45	680
R303	6-11020A75	12k
R304	6-11020A76	13k
R305	6-11020A51	1.2k
R306	6-11020A73	10k
R307	6-10621C87	9090 ± 1%
R308	6-10621C91	10.0k ± 1%
R309		NOT USED
R310	6-11020A27	120
R311	6-11020A43	560
R312	6-11020A89	47k
R314	6-11020A45	680
R315		NOT USED
R316	6-11020A65	4.7k
R317	6-11020A53	1.5k
R318	6-11020A77	15k
R319	6-11020A73	10k
R320, 321	6-11020A01	10
R325	6-11020A43	560
R326, 327	6-11020A73	10k
R328	6-11020A65	4.7k (TRN5521A, TRN5522A, TRN5523A)
	or 6-11020A55	1.8k (TRN5524A)
R329	6-11020A86	36k (TRN5521A, TRN5522A, TRN5523A)
	or 6-11020A91	56k (TRN5524A)
R330	6-11020B17	620k (TRN5521A, TRN5522A, TRN5523A)
	or 6-11020B14	470k (TRN5524A)
R331	6-11020A65	4.7k (TRN5521A, TRN5522A, TRN5523A)
	or 6-11020A61	3.3k (TRN5524A)
R332	6-11020A73	10k (TRN5521A, TRN5522A, TRN523A)
	or 6-11020A77	15k (TRN5524A)
R333	6-11020A73	10k (TRN5521A, TRN5522A, TRN5523A)
	or 6-11020A77	15k (TRN5524A)
R334	6-11020A86	36k (TRN5521A, TRN5522A, TRN5523A)
	or 6-11020A93	68k (TRN5524A)
R335	6-11020A98	110k (TRN5521A, TRN5522A, TRN5523A)
	or 6-11020A92	62k (TRN5524A)
R336	6-11020A98	110k (TRN5521A, TRN5522A, TRN5523A)
	or 6-11020A92	62k (TRN5524A)
R337	6-11020A57	2.2k
R338, 339	6-11020A97	100k
R340	6-11020A73	10k (TRN5521A, TRN5524A)
	or 6-11020A75	12k (TRN5523A)
	or 6-11020A83	27k (TRN5522A)
R341	18-84944C03	variable, 10k ± 20%
R342	6-11020A57	2.2k (TRN5522A, TRN5523A)
	or 6-11020A59	2.7k (TRN5521A, TRN5524A)
R343	6-11020A01	10
R344	18-84944C03	variable, 10k ± 20%
R345	6-11020A49	1k
R346	6-1102057	2.2k
R347	6-11020A25	100
R348	6-11020A73	10k
R349	6-11020A25	100
R2100, 2101	6-11009C57	2.2k
R2102	6-11009C85	33k
R2103	18-84944C01	variable, 2k ± 20%
R2104	6-11020A57	2.2k
R2105	6-11009C53	1.5k (TRN5521A, TRN5523A, TRN5524A)
	or 6-11009C69	6.8k (TRN5522A)
R2106		NOT USED
R2107, 2108	6-11020A53	1.5k
R2109	6-11020A93	68k (TRN5522A)
	or 6-11020A89	47k (TRN5523A)
	or 6-11020A85	33k (TRN5521A, TRN5522A)
R2110	6-11020A93	68k (TRN5522A)
	or 6-11020A89	47k (TRN5523A)
	or 6-11020A85	33k (TRN5521A, TRN5524A)
R2111	6-11020A85	33k
R2112	6-11020A81	22k
R2113	6-11020A29	150
R2114	6-11020A55	1.8k
R2115	6-11020A85	33k
R2116	6-11020B02	150k
R2117	6-11020A73	10k
R2118	6-11020A55	1.8k
R2119	6-11020A47	820
R2120	6-11020A89	47k
R2121	6-11020A65	4.7k
R2122	6-11020A79	18k
R2123	6-11020A76	13k
R2124	6-11020A73	10k
R2125	6-11020A53	1.5k
R2126	6-11020A51	1.2k
		thermistor:
RT2106	6-82557J06	16k @ 25 °C
		integrated circuit (see note)
U1	51-83629M47	wideband amplifier
U2	51-84561L84	limiter/detector
U50	51-82609M33	dual operational amplifier
U300, 325	51-82609M33	dual operational amplifier
U2100	51-83629M06	quad operational amplifier
		voltage regulator: (see note)
VR54	48-82256C15	Zener type; 5.1 V
VR225	48-82256C33	Zener type; 2.6 V
VR301	48-83461E40	Zener type; 5.1 v ± 1%
VR353	48-82256C11	Zener type; 10 V
VR354	48-82256C20	Zener type; 27 V
VR355	48-82256C11	Zener type; 10 V
VR2100, 2101	48-82256C33	Zener type; 2.6 V
		crystal: (see note)
Y1A, B	48-05535C11	filter matched pair: BRN-GRN (TRN5522A)
	or 48-05535C06	filter matched pair: RED-YEL (TRN5523A)
	or 48-05535C05	filter matched pair: BLK-ORG (TRN5521A, TRN5524A)
Y2A, B	48-05535C07	filter matched pair: BLU-VIO (TRN5524A only)
Y2A, D	48-05535C07	filter matched pair: BLU-VIO (TRN5521A)
	or 48-05535C11	filter matched pair: BRN-GRN (TRN5522A)
	or 48-05535C08	filter matched pair: GRY-WHT (TRN5523A)
Y2C, D	48-05535C07	filter matched pair: BLU-VIO (TRN5524A)
		mechanical parts
	3-84208M03	SCREW, tapping: M2.5 x 0.45 x 6.0; 4 used
	3-84208M01	SCREW, tapping: M3 x 0.5 x 8.0; 2 used
	4-490124	WASHER, flat, 0.092 x .250"; 2 used
	4-84152B01	WASHER, shoulder, nylon; 4 used
	14-05160A01	INSULATOR,crystal; 4 used on (TRN5521A, TRN5522A, TRN5523A) 6 used on (TRN5524A)
	14-84123M01	INSULATOR, shield (for 26-84132M01)
	14-84124M01	INSULATOR, shield; 2 used (for 26-82437N01, and 2)
	14-84391F01	INSULATOR, transistor; 4 used
	1-80737D85	SHIELD, detector input with spring
	1-80737D84	SHIELD, first buffer (Q1) with spring
	1-80737D83	SHIELD, second buffer (Q2) with spring
	26-82437N01	SHIELD, solder side (Y1)
	26-82437N02	SHIELD, solder side (Y2)
	26-84130M01	SHIELD, coil (L5)
	26-84132M01	SHIELD, detector solder side
	26-84104M01	HEAT SINK, main board audio/regulator
	39-10184A10	CONTACT, pin (bubble); 3 used
	43-84136M01	SPACER, standoff; 3 used
	46-84135M01	GUIDE, circuit board

TKN8159C Power Cable (Front Mount 12.5/20 kHz Channel Spacing Models) — PL-7266-E

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		fuse:
F350	65-84711C16	16A
F351	65-84711C07	2.5A
		mechanical parts
P359	15-84192M01	HOUSING, connector; 6-contact
	1-02700B85	ASSEMBLY, fusholder; 3 used
	1-80733D11	ASSEMBLY, black wire and terminal: includes:
	9-84151B03	TERMINAL, female (small); 2 used
	1-80733D20	ASSEMBLY. red wire and terminal (short) includes:
	5-82050H04	EYELET
	14-84710C01	BODY, fuse holder
	41-84707C01	SPRING
	29-82607B03	LUG, ring
	1-80733D21	ASSEMBLY, red wire and terminal (long) includes:
	29-84151L05	TERMINAL, female (large)
	1-80733D22	ASSEMBLY, green wire and terminal (short) includes:
	5-82050H04	EYELET
	14-84710C01	BODY, fuse holder
	41-84707C01	SPRING
	29-865065	LUG, ring
	1-80733D23	ASSEMBLY, green wire and terminal (long) includes:
	9-84151B03	TERMINAL, female (small)
	1-80733D25	ASSEMBLY, black wire and terminal (long) includes:
	29-84151L05	TERMINAL, female (large)

TRN4602A Transmitter Feedthrough Plate — PL-7166-A

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed:
C214, 263, 267, 294, 295, 296	21-84874K01	470 pF ± 20%; 250 V; feed-thru
		connector, receptacle:
J356	9-83663C01	female; single contact
		mechanical parts
	3-84208M01	SCREW, machine: M3 x 0.5 x 8; feed-thru
	4-84207E02	SOLDER RING
	29-84322M01	TERMINAL, pin; feed-thru, 6 used
	64-84212M01	PLATE, feed-thru

TKN8158C Power Cable (Front Mount 25 kHz Channel Spacing Models) — PL-7165-F

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		fuse:
F350	65-4165	15A
F351	65-20404	3A; 250 V
		mechanical parts
P359	15-84192M01	HOUSING, connector; 6-contact
	14-82883A01	INSULATOR, fuseholer; 3 used
	42-82884A01	CLIP, fuseholder; 3 used
	1-80733D11	ASSEMBLY, black wire and terminal; includes:
	9-84151B03	TERMINAL, female (small); 2 used
	1-80733D12	ASSEMBLY, red wire and terminal (short) includes:
	42-82884A01	CLIP, fuse holder
	29-82607B03	LUG, ring
	14-82882A01	BODY, fuse holder
	41-82885A01	SPRING, fuse holder
	1-80733D13	ASSEMBLY, red wire and terminal (long) includes:
	29-84151L05	TERMINAL, female (large)
	1-80733D14	ASSEMBLY, green wire and terminal (short) includes:
	42-82884A01	CLIP, fuse holder
	29-865065	LUG, ring
	14-82882A01	BODY, fuse holder
	41-82885A01	SPRING, fuse holder
	1-80733D15	ASSEMBLY, green wire and terminal (long) includes:
	9-84151B03	TERMINAL, female (small)
	1-80733D17	ASSEMBLY, black wire and terminal (long) includes:
	29-84151L05	TERMINAL, female (large)

TKN8177A Ignition Control PTT (Front Mount 12.5/20 kHz Channel Spacing Models) — PL-7267-B

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		fuse:
F352	65-84711C02	1A
		transistor: (see note)
Q304	48-02081B10	NPN; type M1B10
		resistor, fixed:
R313	6-11020A73	10k ± 5%; 1/4 W
		mechanical parts
	1-02700B85	ASSEMBLY, fuse holder includes:
	3-84708C01	SCREW, set
	14-84709C01	CAP, fuse holder
	29-84706C01	TERMINAL
	1-80733D26	ASSEMBLY, orange wire and eyelet (short) includes:
	5-82050H04	EYELET
	1-80733D27	ASSEMBLY, orange wire and terminal (long) includes:
	9-84151B03	TERMINAL
	14-84710C01	BODY, fuse holder
	41-84707C01	SPRING, fuse holder
	42-10217A02	STRAP, cable harness

TRN4604A Busy Light Board — PL-7170-A

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed:
C1200	23-84665F21	4.7 uF ± 10%; 50 V
		light emitting diode:
DS835	48-84404E10	orange
		connector, pin:
P372	28-84318M04	male; single contact; 4 used
		transistor: (see note)
Q1200	48-02081B10	NPN; type M1B10
Q1201	48-02081B11	PNP; type M1B11
		resistor, fixed: ± 5%; 1/4 W: unless otherwise stated
R1200	6-11020A79	18k
R1201	6-11020A63	3.9k
R1202	18-84944C01	variable; 2k
R1203, 1204	6-11020A89	47k
R1205	6-11020B20	820k
R1206	6-11020A41	470
R1207	6-11020A45	680
		mechanical part
	43-84137M02	SPACER, LED

note: For optimum performance, diodes, transistors, and integrated circuits must be ordered by Motorola part numbers.

MAIN BOARD AND POWER INTERCONNECT BOARD

POWER CABLES
BUSY LIGHT

FUNCTION

The main board contains receiver circuitry, transmitter audio and power control circuitry, and voltage regulation for transmitter and receiver circuits. The power interconnect board provides power distribution for the radio set and feedthrough interconnect from the main to the power amplifier circuitry.

TKN8160A Ignition Control PTT (Front Mount 25 kHz Channel Spacing) — PL-7216-C

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		fuse:
F352	65-52281	1A
		transistor: (see note)
Q304	48-02081B10	NPN; type M1B10
		resistor, fixed:
R313	6-11020A73	10k ± 5%; 1/4 W
		mechanical parts
	1-80733D18	ASSEMBLY, orange wire and clip includes:
	42-82884A01	CLIP, fuse holder
	1-80733D19	ASSEMBLY, orange wire and terminal; includes:
	9-84151B03	TERMINAL
	14-82882A01	BODY, fuse holder
	14-82883A01	CAP, fuse holder
	41-82885A01	SPRING, fuse holder
	42-82884A01	CLIP, fuse holder
	42-10217A02	STRAP, cable harness

note: For optimum performance, diodes, transistors, and integrated circuits must be ordered by Motorola part numbers.

TRN5365A Power Interconnect Board — PL-7167-B

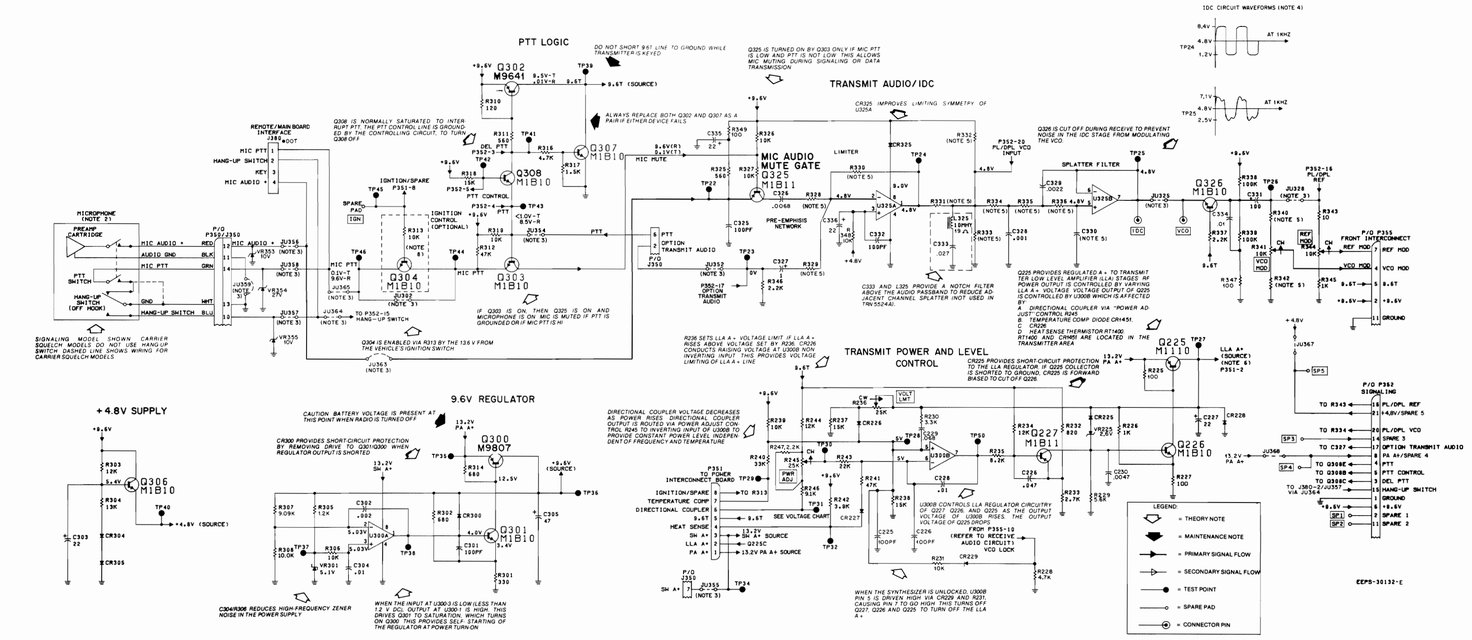
REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		diode: (see note)
CR350	48-82525G13	silicon
CR351	48-82525G19	silicon
RV352	6-84357M01	varistor, metal oxide
		connector, receptacle:
J351	9-83497F10	female; 8-contact
J359	—	includes: (see note 2)
	29-3053	LUG, solder; 2 used
	29-84134M01	TERMINAL, short; 4 used

notes:

1. For optimum performance, diodes, transistors, and integrated circuits must be ordered by Motorola part numbers.
2. For parts not listed in the above parts list refer to the radio set mechanical parts list section.

MAIN BOARD AND POWER INTERCONNECT BOARD

TRANSMITTER



NOTES:

1. Unless otherwise noted, resistor values are in ohms, capacitor values in microfarads, inductor values are in microhenries.
2. Refer to Microphone instruction section for preamplifier information.
3. Refer to Jumper Table.
4. Measured with 800 millivolts rms, 1 kHz input to "MIC AUDIO +" input (J350-12) with "MIC PTT" (J350-14) grounded.
5. Refer to Parts List for component values.
6. LLA refers to low level rf amplifier stage.
7. Voltage notations:
   (T) = Transmitter Keyed
   (R) = Receive (Transmitter Unkeyed)
8. R313 and Q304 are part of "Ignition Control" Option B113.

Transmitter Jumper Table

Jumper	Function	Location
JU302	Cut For Ignition PTT Control Option B113	Q304
JU325	Cut For DVP Voice Privacy Operation	U325B-7
JU328	Install For Special Applications Only	R340
JU352	Cut For Alternate Use of J350-2	J350-2
JU354	Cut For Alternate Use of J350-6	J350-6
JU355	Cut For Alternate Use of J350-7	J350-7
JU356	Cut For Alternate Use of J350-12	J350-12
JU357	Cut For Alternate Use of J350-10	J350-10
JU358	Cut For Alternate Use of J350-14	J350-14
JU359	Cut For Alternate Use of J350-11	J350-11
JU363	Cut For Alternate Use of J350-12 And J380-4 (MIC AUDIO +)	Q325-E
JU364	Cut For Alternate Use of J350-10 And J380-2 (Hang-Up Switch)	P352-15
JU365	Cut For Alternate Use of J350-14 And J380-1 (MIC PTT)	Q304-E
JU367	Cut For Alternate Use of P352-21	P352-21
JU368	Install For DVP Voice Privacy Operation	P352-8

Component Designation

Transmit Audio/IDC	325-349
9.6 V Regulator, 4.8 V Regulator and PTT Logic	300-324
Transmit Power & Level Control	2125-249 and U300B

Integrated Circuit Chart

Reference Number	Type Number	V+ Pin	V− Pin	Description
U300, U325	09M33	8	4	Dual Op Amp

TP31 Voltage Chart

Output Power	TP31 Voltage
0 Watts	2.0 V
10 Watts	1.6 V
30 Watts	1.3 V

parts list

TKN8173B Power Cable Remote Mount (CUA Models) PL-7464-C

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		fuse:
F350	65-10266	10A, 32 V
F351	65-20404	3A; 250 V
F353	65-10266	10A; 32 V
		mechanical parts
P359	15-84192M01	HOUSING, connector; 6-contact
	14-82883A01	INSULATOR, fuseholder; 3 used
	42-82884A01	CLIP, fuseholder; 3 used
	1-80733D11	ASSEMBLY, black wire and terminal, includes:
	9-84151B03	TERMINAL, female (small); 2 used
	1-80734D03	ASSEMBLY, red wire (short remote) includes:
	14-82882A01	BODY, fuseholder
	29-832116	LUG, ring tongue (3/8" stud)
	41-82885A01	SPRING, fuseholder
	14-84710C01	BODY, fuseholder
	1-80734D04	ASSEMBLY, red wire #18 (short remote) includes:
	14-82882A01	BODY, fuseholder
	29-865065	LUG, ring tongue (3/8" stud)
	41-82885A01	SPRING, fuseholder
	42-82884A01	CLIP, fuseholder
	1-80734D05	ASSEMBLY, black wire (short remote) includes:
	14-82882A01	BODY, fuseholder
	29-832116	LUG, ring tongue (3/8" stud)
	41-82884A01	CLIP, fuseholder
	41-82885A01	SPRING, fuseholder
	1-80734D06	ASSEMBLY, red wire (long remote) includes:
	29-84151L05	TERMINAL, female (large)
	1-80734D07	ASSEMBLY, red wire #18 (long remote) includes:
	9-84151B03	RECEPTACLE, female; single contact
	1-80734D08	ASSEMBLY, black wire (long remote) includes:
	29-84151L05	TERMINAL, female (large)
	14-82883A01	CAP, fuseholder; 3 used
	42-10217A02	STRAP, cable harness; 6 used
	42-10217A14	STRAP, tie; 0.140 x 5.50
	42-82884A01	CLIP, fuse; 3 used

TKN8174B Power Cable Remote Mount (EMA Models) PL-7465-B

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		fuse:
F350	65-84711C06	10A
	or 65-84711C04	6.3A
F351	65-84711C07	2.5A
F353	65-84711C06	10A
	or 65-84711C04	6.3A
		mechanical parts
P359	15-84192M01	HOUSING, connector; 6-contact
	29-832116	LUG, ring tongue (3/8" stud)
	1-02700B85	ASSEMBLY, fuseholder; 3 used
	1-80733D11	ASSEMBLY, black wire and terminal, includes:
	9-84151B03	TERMINAL, female (small); 2 used
	1-80734D09	ASSEMBLY, red wire (short remote) includes:
	5-82050H04	EYELET, special
	14-84710C01	BODY, fuseholder
	29-832116	LUG, ring tongue (3/8" stud)
	41-84707C01	SPRING, fuseholder
	1-80734D10	ASSEMBLY, red wire #18 (short remote) includes:
	5-82050H04	EYELET, special; 0.121 x 0.101
	14-84710C01	BODY, fuseholder
	29-865065	LUG, ring tongue (3/8" stud)
	41-84707C01	SPRING, fuseholder
	1-80734D11	ASSEMBLY, black wire (short remote) includes:
	5-82050H04	EYELET, special; 0.121 x 0.101
	14-84710C01	BODY, fuseholder
	29-832116	LUG, ring tongue (3/8" stud)
	41-84707C01	SPRING, fuseholder
	1-80734D12	ASSEMBLY, red wire #18 (long remote) includes:
	29-84151L05	TERMINAL, female (large)
	1-80734D13	ASSEMBLY, red wire #18 (long remote) includes:
	9-84151B03	RECEPTACLE, female; single contact
	1-80734D14	ASSEMBLY, black wire (long remote) includes:
	29-84151L05	TERMINALS, female (large)
	42-10217A02	STRAP, cable harness; 6 used
	42-10217A14	STRAP, tie; 2 used

TKN8197A Ignition Control PTT Remote (CUA Model) PL-7468-A

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		fuse:
F352	65-52281	1A
		transistor: (see note)
Q304	48-02081B10	NPN; type M1B10
		resistor:
R313	6-11020A73	10k ±5%; 1/4 W
		mechanical parts
	1-80732D45	ASSEMBLY, org. wire and terminal (long) includes:
	9-84151B03	RECEPTACLE, contact; female
	1-80733D18	ASSEMBLY, org. wire and terminal (short) includes:
	42-82884A01	CLIP, fuseholder
	14-82882A01	BODY, fuseholder
	14-82883A01	CAP, fuseholder
	41-82885A01	SPRING, fuseholder
	42-10217A02	STRAP, cable harness
	42-82884A01	CLIP, fuseholder

TKN8198A Ignition Control PTT Remote (EMA Model) PL-7469-A

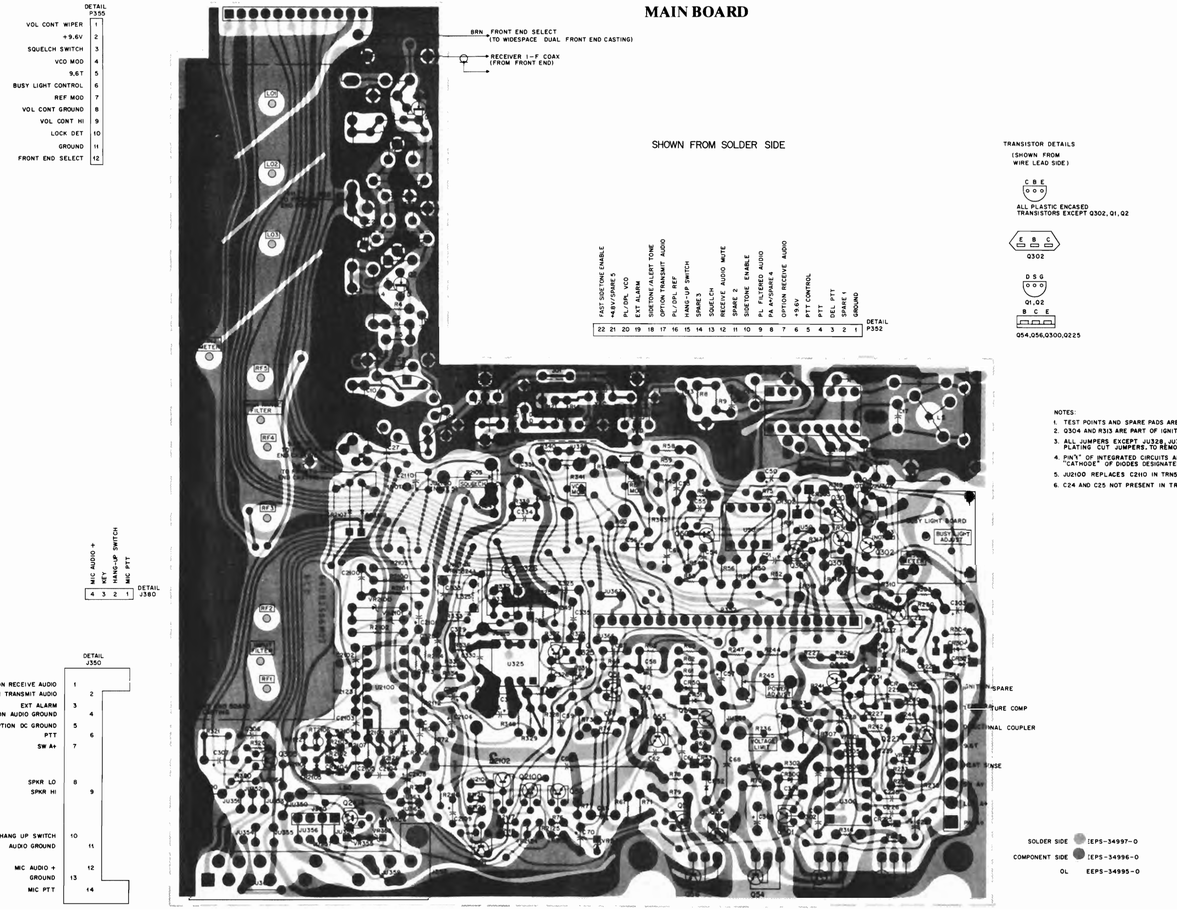
REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		fuse:
F352	65-84711C02	1A
		transistor: (see note)
Q304	48-02081B10	NPN; type M1B10
		resistor:
R313	6-11020A73	10k ±5%; 1/4 W
		mechanical parts
	1-02700B85	ASSEMBLY, cap; fuseholder
	1-80733D26	ASSEMBLY, org. wire and terminal (short) includes:
	5-82050H04	EYELET, special; 0.121 x 0.101
	1-80732D46	ASSEMBLY, org. wire and terminal (long) includes:
	9-84151B03	RECEPTACLE, contact; female
	42-10217A02	STRAP, cable harness
	14-84710C01	BODY, fuseholder
	41-84707C01	SPRING

note: For optimum performance, diodes, transistors, and integrated circuits must be ordered by Motorola part numbers.

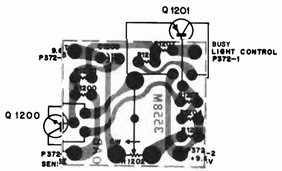
MAIN BOARD AND POWER INTERCONNECT BOARD

CIRCUIT BOARD DETAILS

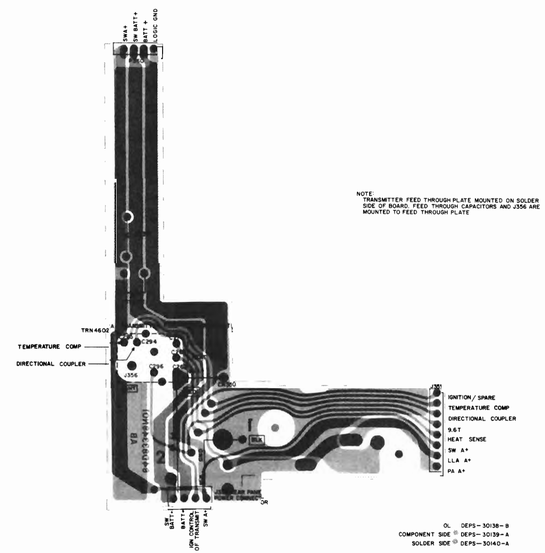
MAIN BOARD



BUSY LIGHT BOARD

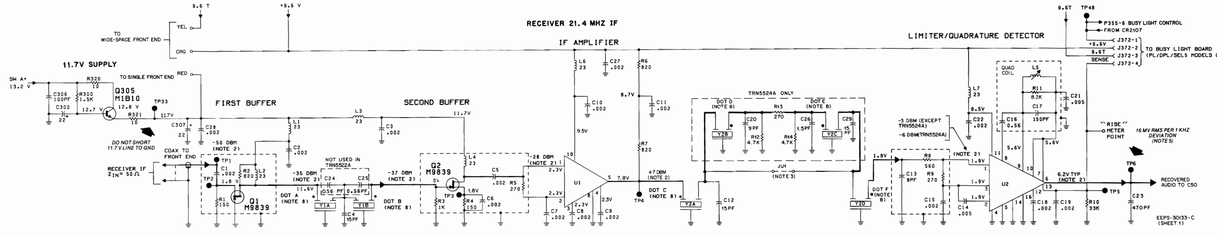


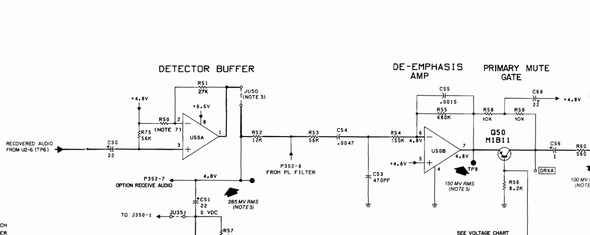
POWER INTERCONNECT BOARD

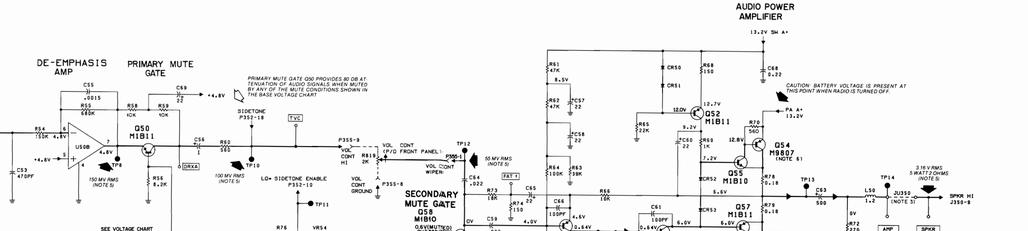


MAIN BOARD, POWER INTERCONNECT BOARD

RECEIVER







MAIN BOARD AND POWER INTERCONNECT BOARD
RECEIVER

NOTES:

1. Unless otherwise noted, resistor values are in ohms, capacitor values are in microfarads, inductor values are in microhenries.
2. Measured with -50 dBm 21.4 MHz unmodulated signal at I-f input or with an unmodulated on-channel signal at the antenna input at a level of -60 dBm (VHF radios without widespaced receive option) or -53 dBm (all UHF radios, or VHF radios with widespaced receive option).
3. Refer to Jumper Table.
4. Measured with squelch adjust control R2103 set for opening sensitivity of 10 dB quieting.
5. Measured with 1 mV on-channel signal at antenna input modulated with 1 kHz tone at 3 kHz deviation (TRN5521A or TRN5524A), 2.4 kHz deviation (TRN5523A) or 1.5 kHz deviation (TRN5522A), and volume control adjusted for 5 watt audio output.
6. Mounted on heat sink, must be insulated from ground.
7. Refer to parts list for component value.
8. Refer to Table 1 for crystal filter coding.

Table 1. Crystal Filter Coding

Kit No.	Channel Spacing	Color Dot A	B	C	D	E	F
TRN5521A	25/30	BLK	ORG	BLU	—	—	VIO
TRN5522A	12.5	BRN	GRN	BRN	—	—	GRN
TRN5523A	20	RED	YEL	GRY	—	—	WHT
TRN5524A	20/25 (Japan)	BLK	ORG	BLU	VIO	BLU	VIO

Table 2. Receiver Jumper Table

Jumper	Function	Location
JU1	Cut For 12-Pole I-F (TRN5524A Only)	Y2
JU50	Cut For Special Applications Only	U50A
JU350	Cut For Special Applications Only	J350-9
JU351	Cut For Alternate Use of J350-1	J350-1
JU353	Cut For Alternate Use of J350-3	J350-3
JU352	Cut For Alternate Use of J350-5	J350-5
JU366	Cut For Alternate Use of P352-22	Q58-B
JU2100	Install For TRN5522A Only	Replaces C2110
JU2101	Cut For *DVP* Voice Privacy Operation	Q2102-B

Integrated Circuit Chart

Reference Number	Type Number	V – Pin	V + Pin	Description
U1	29M47	8	10	Wideband Amp
U2	M6164	4/14	11	Limiter/Quadrature Detector
U50	09M53	4	8	Dual Op Amp
U2100	29M06	7	11	Quad Op Amp

Component Designations

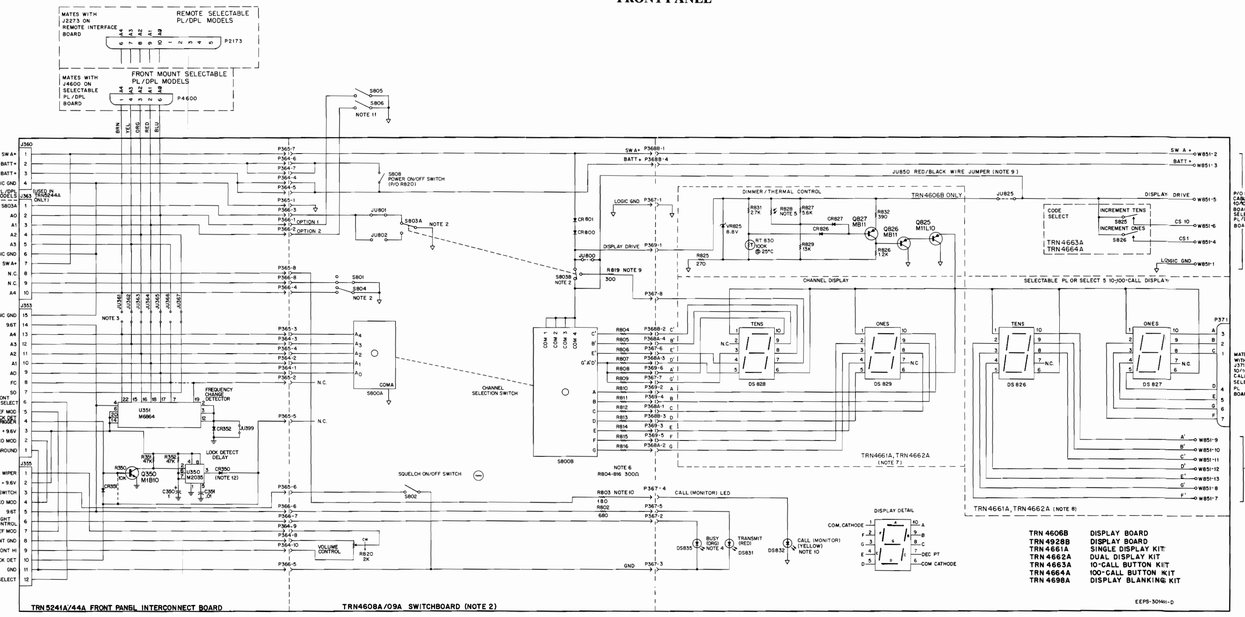
I-F	01-49
Receiver Audio	50-99
Squelch	2100-2149

TP9 Mute Voltage Chart

Condition	TP9 Volts DC
Unsquelched	4.2
Carrier Squelch Mute	8.4
PL/DPL Squelch Mute	9.0
"Select 5" Squelch Mute	9.0
Transmit	9.0
VCO Unlocked	9.0

FRONT PANEL BOARDS

SCHEMATIC DIAGRAM



NOTES:

1. Resistor values given in ohms.
2. All pushbutton switches are shown in the "OUT" position. Function and position of switches designated S801, S803, and S804 change with option/model configuration. Refer to signaling switch chart.
3. Refer to jumper chart.
4. Busy light not used in carrier squelch or encode only models. DS835 is part of Busy Light Kit TRN4604A.
5. R828 value is greater than 200k when dark, nominal 30k at 1 footcandle.
6. R806-R809 in 32-channel models only (TRN4609A).
7. DS828, DS829 used in models with 10 or more channels only (TRN4662A). DS829 used in models with 2 to 9 channels only (TRN4661A).
8. DS826 and DS827 used in models with Select 5 signaling 100-call option or selectable PL/DPL squelch 30-code option. DS827 used in models with Select 5 signaling 10-call option or selectable PL/DPL squelch 10-code option.
9. For display blanking JU800 and JU825 are cut, and wire jumper JU850 is added between display board and switch board. Resistor R819 is added (p/o TRN4698A Display Blanking Kit).
10. Call light DS832 and resistor R803 are part of Select 5 and PL/DPL Scan Base option board kits. DS832 is referenced CALL for Select 5 and MONITOR for Scan Base.
11. S805 and S806 are mounted directly to front panel. Refer to thumbwheel switch manual section for kit and part numbers.
12. CR350 removed for use with FAST-LOK Synthesizer.

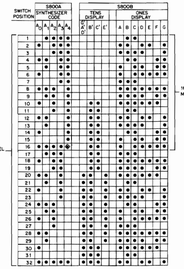
Jumper Chart

JU361	In for 17-32 channel, multi PL/DPL only
JU362	Cut for selectable PL/DPL squelch option
JU363	Cut for selectable PL/DPL squelch option
JU364	Cut for selectable PL/DPL squelch option
JU365	Cut for selectable PL/DPL squelch option
JU366	In for special applications
JU367	Cut for special applications
JU399	Cut for dash mount *Channel-Scan* radios
JU800	Cut for display blanking with TRN4698A Kit
JU825	Cut for display blanking with TRN4698A Kit
JU850	In for display blanking (p/o TRN4698A Kit)
JU801	In when S803 is latching switch
JU802	In when S803 is momentary contact switch

SIGNALING SWITCH CHART

SWITCH DESIGNATION	SYMBOL	TYPE	BUTTON/SWITCH KIT	FUNCTION
S801		LATCHING	TRN4660A	SELECT 5 MONITOR
S803		LATCHING	TRN4660A	PL/DPL MONITOR
		LATCHING	TRN4656A	SECONDARY CALL/ EXTERNAL ALARM
		MOMENTARY	TRN4658A	SELECT 5 CALL
		MOMENTARY	TRN4657A	SINGLE TONE REPEATER
S804		MOMENTARY	TRN4658A	SELECT 5 CALL
		MOMENTARY	TRN4659A	5-TONE REPEATER
S805		MOMENTARY	NOTE 13	SINGLE TONE REPEATER
S806		MOMENTARY	NOTE 13	2-SINGLE TONE REPEATER

SWITCH CONTACT TABLE



SWITCH CONNECTION DETAIL

NOTES :
1. 'S' & 'D' AND 'C' USED IN 32-CHANNEL MODELS ONLY
2. NC DENOTES NOT CONNECTED.

CEPS-30142-O

FRONT PANEL BOARDS

CIRCUIT BOARD DETAILS AND PARTS LISTS

parts list

TRN4606B Display Board, 2-32F
TRN4928B Display Board, 2-32F w/Thumbwheel Switches — PL-7174-C

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		diode: (see note)
CR826, 827	48-84399M01	silicon
		light emitting diode:
DS831	48-84404E03	red (transmit indicator)
DS832	48-84404E05	yellow, (Select 5 & Channel Scan base models only)
		connector, receptacle:
J367	9-83880M02	female; 8-contact
J368A, 368B	9-83880M04	female; 4-contact
J369	9-83080M03	female; 6-contact
		transistor: (see note)
Q825	48-84411L10	PNP; type M1110
Q826, 827	48-02081B11	PNP; type MB11
		resistor, fixed: ± 5%; 1/4 W: unless otherwise stated
R825	6-11009C35	270
R826	6-11020A51	1.2k
R827	6-11020A67	5.6k
R828	6-84292M01	light dependent
R829	6-11009C76	13k
R831	6-11020A59	2.7k
R832	6-11020A39	390
		thermistor:
RT830	6-38600K05	100k @ 25°C
		voltage regulator:
VR825	48-82256C56	Zener type; 8.8 V
		mechanical parts
	43-84063M01	SPACER, wire (TRN4606B only)
	4-84345A15	WASHER, insulating
	43-84137M02	SPACER, LED

notes:
1. For optimum performance, diodes, transistors, and integrated circuits must be ordered by Motorola part numbers.

TRN4698A Display Blanking Kit — PL-7516-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		resistor, fixed:
R819	6-11020A36	300 ± 5%; 1/4 W
		jumper, wire:
JU850	30-10286B95	wire (3.25")

TRN4608A Front Mount Switch Board, 16 Channel
TRN4609A Front Mount Switch Board, 32 Channel — PL-7188-B

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		diode: (see note)
CR801, 802	48-82466H13	silicon
		connector, receptacle:
J364	9-83880M01	female; 10-contact
J365, 366	9-83880M02	female; 8-contact
		connector, plug:
P367	28-84528K15	male; 8-contact
P368A, 368B	28-84528K17	male; 4-contact
P369	28-84528K16	male; 6-contact
		resistor, fixed:
R802	6-11009C45	680 ± 5%; 1/4 W
R803	6-11009C31	180 ± 5%; 1/4 W (Select 5 & Channel Scan base models only)
R804, 805, 810 thru 816	6-11009C36	300 ± 5%; 1/4 W
R806 thru 809	6-11009C36	300 ± 5%; 1/4 W (TRN4609A)
R820	18-84075M01	variable; 2k ± 20%; .05 W; includes S808
		switch:
S800	40-82270M01 or 40-82270M02	rotary; 16-position (TRN4608A) rotary; 32-position (TRN4609A)
S802	40-84330M02	spst, squelch

notes:
1. For optimum performance, diodes, transistors, and integrated circuits must be ordered by Motorola part numbers.
2. For parts not listed in the above parts list refer to the radio set mechanical parts list section.

TRN4656A Secondary Call/External Alarm Switch w/Button
TRN4657A Single Tone Repeater Switch w/Button
TRN4658A *Select 5* Call Switch w/Button
TRN4659A 5-Tone Repeater Access Switch w/Button
TRN4660A Monitor Switch w/Button — PL-7200-B

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		switch:
S801 or 803	40-84330M02	dpdt, latching
S803, 804	40-84330M01	dpdt, momentary contact

note: Refer to exploded view details for button illustration and part numbers.

TRN4661A Single Display
TRN4662A Dual Display — PL-7175-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		light emitting diode:
DS828, 829	48-83477K04	7-segment (DS828 in TRN4662A only)

note: For parts not listed in the above parts list refer to the radio set mechanical parts list section.

TRN4663A 10-Call Button w/Switch
TRN4664A 100-Call Button w/Switch — PL-7515-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		connector, plug:
P371	28-82502M03	male; 7-contact
		switch:
S805, 806	40-82473N01	dual spst; circuit board dome contact

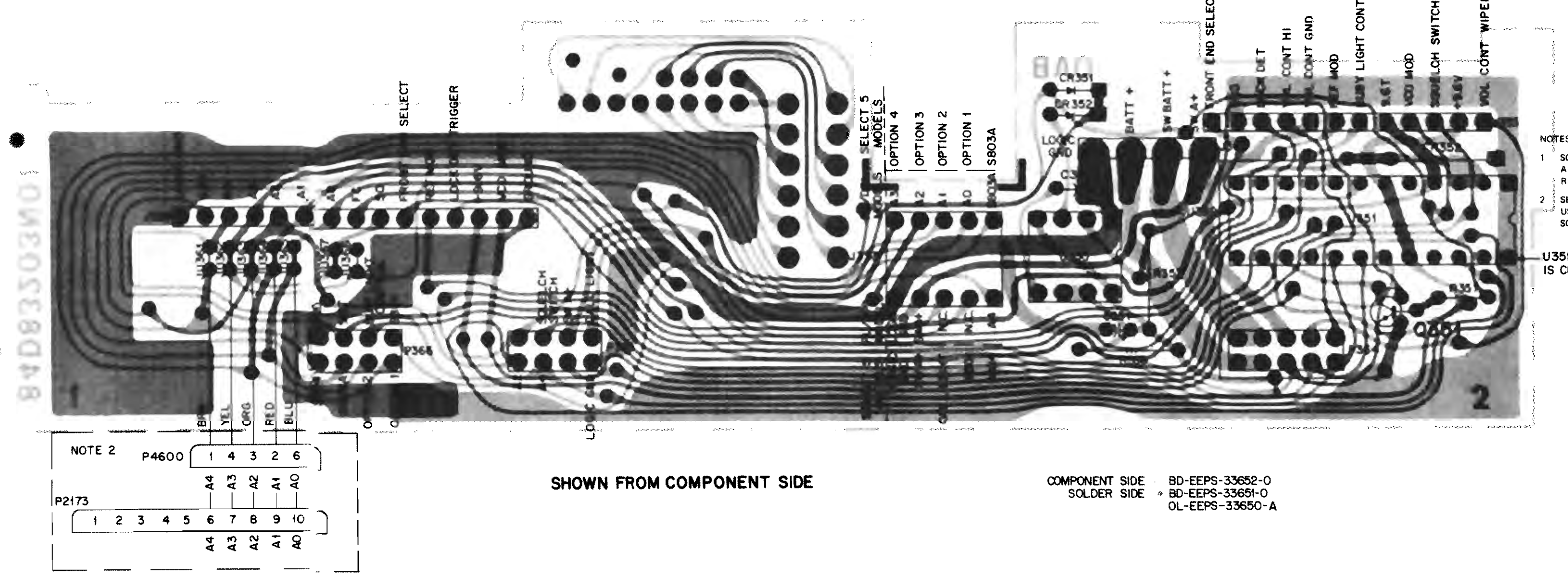
note: Refer to *Select 5* signaling exploded view detail for mechanical parts.

TRN5241A Front Panel Interconnect Board (Standard)
TRN5244A Front Panel Interconnect Board (Signaling) — PL-7809-A

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor:
C350	23-82397D36	1 uF ± 10%, 50 V
C351	21-11025A01	.01 uF ± 20%, 25 V
		diode: (see note)
CR350, 351	48-83654H01	silicon
CR352	48-82178A06	germanium
		connector, receptacle:
J353	1-80731D21	ASSEMBLY synthesizer connector includes:
	15-84164M01	HOUSING, socket
	30-84165M01	CABLE, 15 cond; flat with terminal
	39-84323M01	CONTACT, 15 used
J355	9-82846L03	female; 12-contact
J363	9-83880M01	female; 10-contact (TRN5244 only)
		connector, plug:
J360	28-83878M01	male; 4-contact
P364	28-84528K14	male; 10-contact
P365, 366	28-84528K15	male; 8-contact
		transistor: (see note)
Q350	48-2081B10	NPN; type M1B10
		resistor, fixed: ± 5%; 1/4 W:
R350	6-11009C73	10k
R351, 352	6-11009C89	47k
		integrated circuit: (see note)
U350	51-84561L23	type 61L23, timer
U351	51-84768F54	type 68F54, freq. change det.

note: For optimum performance, diodes, transistors, and integrated circuits must be ordered by Motorola part numbers.

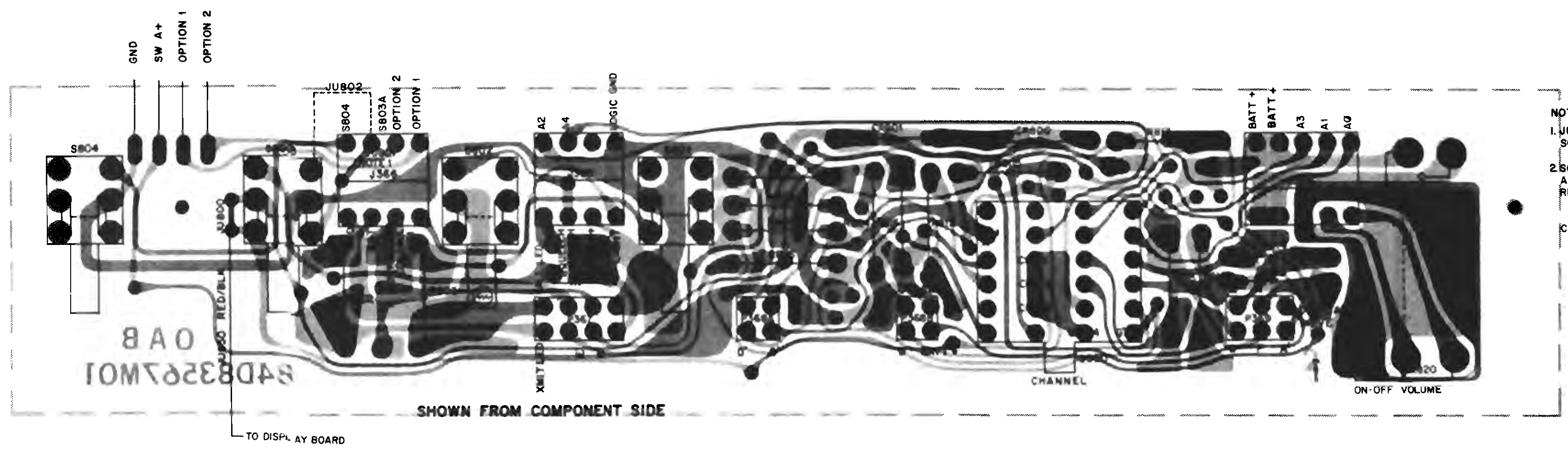
TRN5241A/44A FRONT PANEL INTERCONNECT BOARD (LATER VERSION)



NOTES
1 SOME MODELS MAY NOT HAVE ALL COMPONENTS SHOWN. REFER TO SCHEMATIC DIAGRAM
2 SELECTABLE PL-DPL MODELS USE P2173 OR P4600. REFER TO SCHEMATIC DIAGRAM

U351-24 IS CUT

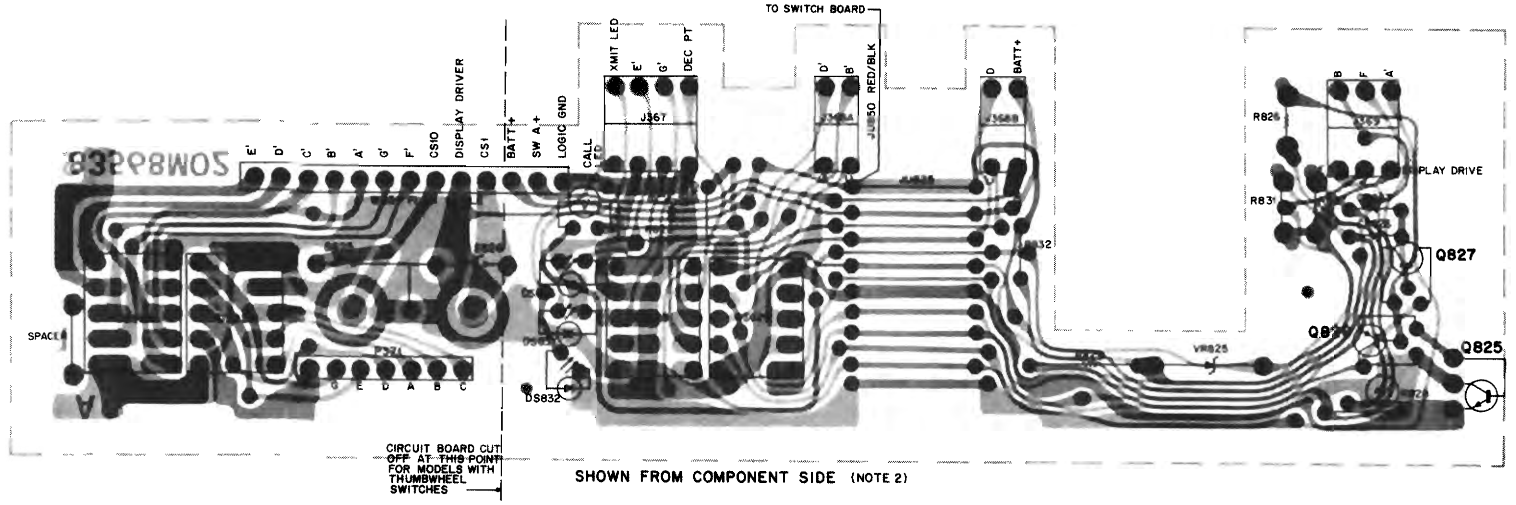
SWITCH BOARD



NOTES:
1. JU801 IS PLATING ON SOLDER SIDE OF BOARD.
2. SOME MODELS MAY NOT HAVE ALL COMPONENTS SHOWN REFER TO SCHMATIC DIAGRAM

OL DEPS-30150-C
COMPONENT SIDE DEPS-30151-A
SOLDER SIDE DEPS-30152-A

MULTI-CHANNEL DISPLAY BOARD



NOTES:
1. ALL MODELS MAY NOT HAVE ALL COMPONENTS SHOWN. REFER TO SCHEMATIC DIAGRAM.
2. DISPLAYS MOUNTED ON SOLDER SIDE OF BOARD.

OL DEPS-30146-C
COMPONENT SIDE DEPS-30147-A
SOLDER SIDE DEPS-30148-B

FUNCTION

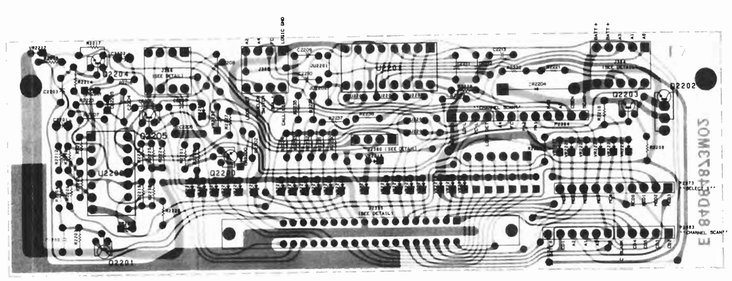
Provides channel selection and display, and all controls and indicators.

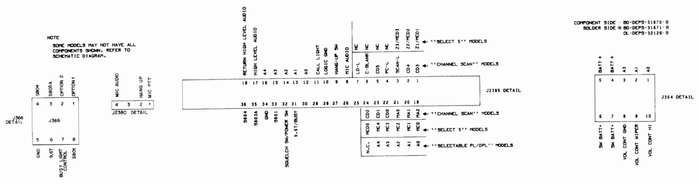
REMOTE FRONT PANEL BOARDS

CIRCUIT BOARD DETAILS
AND PARTS LISTS

68P81047E26-C
(Sheet 1 of 4)
1/19/83· PHI

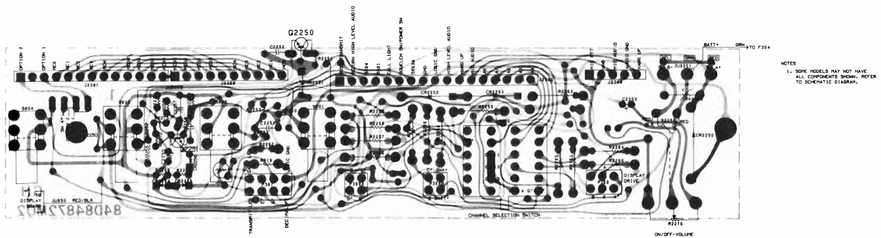
REMOTE INTERFACE BOARD





SHOWN FROM COMPONENT SIDE

REMOTE SWITCH BOARD



SHOWN FROM COMPONENT SIDE

COMPONENT SIDE: 80-D6PS-31873-A
SOLDER SIDE: 80-D6PS-31874-A
DL-D6PS-31872-B

parts list

TKN8171A Remote Control Cable (8 ft.)
TKN8172A Remote Control Cable (17 ft.) PL-7463-A

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		connector, plug:
P2385	28-82004N01	male, flat; 2 x 18 contact
P2386	9-84319M04	female; 17-contact
P2387	9-84319M05	female; 13-contact
		mechanical parts
	15-84994M01	COVER, plug (set of 2)
	42-10217A02	STRAP, cable harness
	42-84995M01	CLIP, plug retainer (see note)

note: Refer to Radio Set Mechanical Parts List/Exploded View section.

TKN8176A Remote Control Head Power Cable (EMA Models) PL-7467-B

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		fuse:
F351	65-84711C02	1A
		mechanical parts
	1-02700B85	ASSEMBLY, fuse holder
	1-80733D22	ASSEMBLY, green wire and terminal short includes:
	5-82050H04	EYELET, special 0.121 x 101
	14-84710C01	BODY, fuse holder
	29-865065	LUG, ring tongue; 3/8" stud
	41-84707C01	SPRING, fuse holder
	1-80734D02	ASSEMBLY, green wire long includes:
	29-82141N01	TERMINAL

TRN4766A Remote Switch Board, 16 Channel
TRN4767A Remote Switch Board, 32 Channel PL-7461-B

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed:
C2250	23-11037A27	22 uF ± 20%; 25 V
C2251	8-11017B06	.01 uF ± 10%; 50 V
C2252	21-11022M42	100 pF ± 5%; 50 V
C2253, 2254, 2255	23-11037A27	22 uF ± 20%; 25 V
C2256	21-11022M42	100 pF ± 5%; 50 V
C2257	21-11021E09	470 pF ± 10%; 50 V
		diode: (see note)
CR2250	48-82525G19	silicon
CR2252, 2253	48-82466H13	silicon
CR2254, 2255, 2256	48-84399M01	silicon
		connector, plug:
J2386	28-84318M13	male, 17-contact
J2387	28-84318M12	male, 13-contact
J2388	28-84318M03	male, 10-contact
J2389	28-84318M11	male, 5-contact
P367	28-84528K15	male, 8-contact
P368A, 368B	28-84528K17	male, 4-contact
P369	28-84528K16	male, 6-contact
		transistor: (see note)
Q2250	48-869648	NPN; type M9648
Q2251	48-02081B10	NPN; type M1B10
		resistor, fixed: ± 5%; 1/4 W: unless otherwise stated
R2251	6-11020A43	560
R2252	6-11020A49	1k
R2253	6-11020A73	10k
R2254, 2255	6-11009C36	300
R2256 thru 2259	6-11009C36	300 (TRN4767A only)
R2260 thru 2266	6-11009C36	300
R2267	6-11020A34	240
R2269, 2270	6-11020A37	330
R2271, 2272	6-11020A89	47k
R2273	6-11020A73	10k
R2274	6-11020A49	1k
R2275	6-11020A73	10k
R2276	18-84075M01	variable; 2k (includes switch S2250)
		varistor:
RV2250	6-84357M01	metal oxide
		switch:
S800	40-82270M01 or 40-82270M02	16 position (TRN4766A) 32 position (TRN4767A)
S801	40-84330M02	latching
S2250	—	p/o R2276
		voltage regulator: (see note)
VR2251	48-82256C11	Zener type; 10 V
		mechanical part
	39-10184A10	PIN, bubble; 3 used

note: For optimum performance, diodes, transistors, and integrated circuits must be ordered by Motorola part numbers.

TKN8195A Cable Remote Multicall Interconnect PL-7530-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		connector, receptacle:
P2273, 2373	9-84319M02	female, 10-contact
		mechanical part
	42-10217A02	STRAP, cable harness WHT; 2 used

TKN8196A Cable, Remote *Channel Scan* Interconnect PL-7541-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		connector, receptacle:
P2283	9-84319M07	female; 11-contact
P2284	9-84319M08	female; 12-contact
P2383	9-84319M07	female; 11-contact
P2384	9-84319M08	female; 12-contact
		connector, plug
J2383	28-83186M04	male, right angle; 11-contact
J2384	28-83186M05	male, right angle; 12-contact
		non-referenced items
	1-80732D48	CABLE, remote *Channel Scan* interconnect 11-cond; includes ref. items: P2383, P2283, and
	42-10217A02	STRAP, cable harness WHT; 2 used
	1-80732D49	CABLE, remote *Channel Scan* interconnect 12-cond; includes ref. items P2384, P2284, and
	42-10217A02	STRAP, cable harness WHT; 2 used

TRN4763B Basic Remote Interface Board
TRN4764B Universal Remote Interface Board PL-7462-C

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor:
C2200	21-11022M42	100 pF ± 5%; 50 V
C2201, 2202	23-11037A27	22 uF ± 20%; 25 V
C2203	21-11022M42	100 pF ± 5%; 50 V
C2204	8-11017B14	.047 uF 10%, 50 V
C2205	23-11037A27	22 uF ± 20%; 25 V
C2206-2208	21-11022M42	100 pF ± 5%; 50 V
C2209-2213	21-11025A01	.01 uF ± 20%; 25 V
		diode: (see note)
CR2200, 2201, 2203	48-84399M01	silicon
CR2204	48-82525G19	silicon
CR2205	48-84399M01	silicon
		connector, receptacle:
J364	9-83880M01	female; 10-contact
J365, 366	9-83880M02	female; 8-contact
J2273	28-84318M03	male; 10-contact (TRN4764A only)
J2283	28-84318M14	male; 11-contact (TRN4764A only)
J2284	28-84318M15	male; 12-contact (TRN4764A only)
J2380	28-84318M10	male; 4-contact
J2385	9-82003N01	female; 36-contact
		connector, plug:
P380, 2380	9-84319M06	female; 4-contact
		transistor: (see note)
Q2200, 2201	48-02081B10	NPN; type M1B10
Q2202	48-869806	NPN; type M9806
Q2203	48-02081B11	PNP; type M1B11
Q2204, 2205	48-02081B10	NPN; type M1B10
		resistor, fixed: ± 5%; 1/4 W: unless otherwise stated
R2200	6-11020A49	1k
R2201	6-11020A65	4.7k
R2202	6-11020A21	68
R2203	6-11020A65	4.7k
R2204	6-11020A73	10k
R2205	6-11020A75	12k
R2206	6-11020A73	10k
R2207	6-11020A61	3.3k
R2208	6-11020A45	680
R2209	6-11020A57	2.2k
R2210	6-11020A45	680
R2211, 2212	6-11020A73	10k
R2213	6-11020A75	12k
R2214	6-11020A49	1k
R2215	6-11020A43	560
R2216	6-11020A57	2.2k
R2217	6-11020A73	10k
R2218	6-11020A81	22k
R2219	6-11020A76	13k
R2220	6-11020A51	1.2k
R2221	6-11020A33	220
R2222	6-11020A51	1.2k
R2223	6-11020A61	3.3k
R2224	6-11020A83	27k
R2225	6-11020A45	680
R2226	6-11020A61	3.3k
R2227	6-11020A73	10k
R2229-2234	6-11020A89	47k (TRN4764B only)
R2235-2239	6-11020A25	100
		integrated circuit: (see note)
U2200	51-83629M06	type 29M06; quad op amp
U2201	51-83627M62	three-state buffer (TRN4764B only)
		voltage regulator: (see note)
VR2202	48-82256C15	Zener type; 5.1 V
VR2204-2218	48-82256C11	Zener type; 10 V
VR2219	48-82256C14	Zener type; 15 V (TRN4764B only)
VR2220-2231	48-82256C11	Zener type; 10 V (TRN4764A only)
VR2232	48-82256C26	Zener type; 3.3 V
		mechanical parts
	1-80732D47	ASSEMBLY INTERCONNECT CABLE; includes:
	42-10217A02	STRAP, cable harness; 3 used; includes reference items P380, P2380

note: For optimum performance, diodes, transistors, and integrated circuits must be ordered by Motorola part numbers.

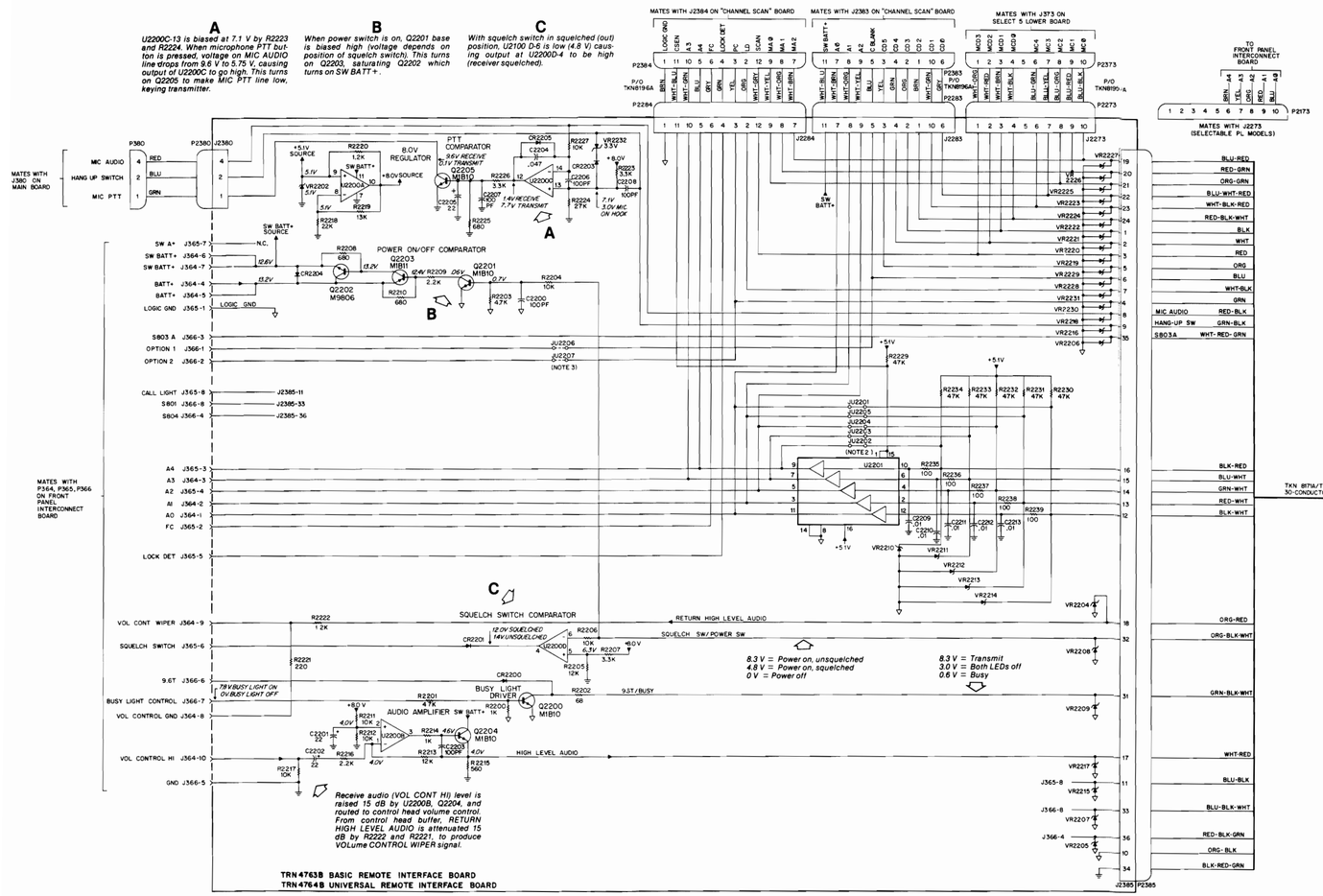
TKN8175A Remote Control Head Power Cable (CUA Models) PL-7466-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		fuse:
F351	65-52281	1A
		mechanical parts
	1-80733D14	ASSEMBLY, green wire and terminal (short) includes:
	14-82882A01	BODY, fuse holder
	29-865065	LUG, ring tongue (3/8" stud)
	41-82885A01	SPRING, fuse holder
	42-82884A01	CLIP, fuse holder
	1-80734D01	ASSEMBLY, green wire long remote; includes:
	29-82141N01	TERMINAL
	14-82883A01	CAP, fuse holder
	42-82884A01	CLIP, fuse holder

REMOTE FRONT PANEL BOARDS

REMOTE INTERFACE BOARD

REMOTE INTERFACE BOARD AND CABLE



NOTES:

1. Resistor values given in ohms, capacitor values given in microfarads (uF), unless otherwise stated.
2. JU2201-JU2205 cut for Channel Scan monitoring models only.
3. JU2206, JU2207 IN for special options only.

P2387 Line Name Chart

Pin No.	Option Configuration: Select 5 With Thumbwheel Switch Options	Select 5 With 10/100-Call	Selectable PL/DPL	Channel Scan Monitoring
1	N.C.	N.C.	N.C.	PC
2	N.C.	N.C.	N.C.	CD5
3	N.C.	N.C.	N.C.	C BLANK
4	MC0	N.C.	A0	MA2
5	MC1	N.C.	A1	MA1
6	MC2	N.C.	A2	MA0
7	MC3	MC3	A3	CD0
8	MC4	MC4	A4	CD1
9	N.C.	N.C.	N.C.	LD
10	MCD0	MCD0	N.C.	CD2
11	MCD1	MCD1	N.C.	CD3
12	MCD2	MCD2	N.C.	CD4
13	MCD3	MCD3	N.C.	SCAN
Mating Connector and Destination	J2387 Remote Switch Board	J1387 Remote 10/100 Call Board	J3387 Remote Selectable PL/DPL Board	J4387 Remote Display Buffer Board

LEGEND:
- THEORY NOTE
- SIGNAL FLOW
- PIN AND SLEEVE CONNECTION
- GROUND
- LOGIC GROUND
- CIRCUIT BOARD SOLDER CONNECTION

FUNCTION

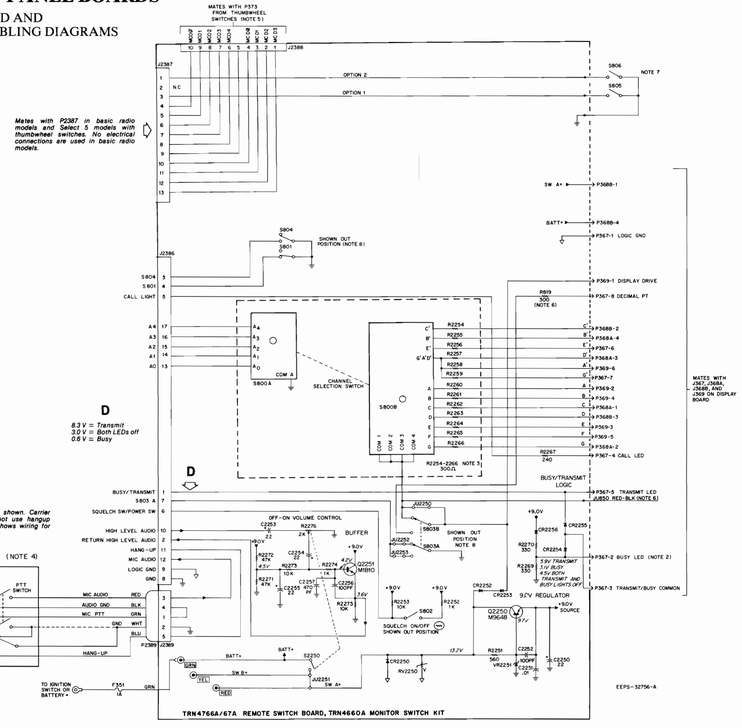
Allows radio set to be mounted in remote location such as under seat or in trunk, and be controlled from the vehicle dashboard.

Refer to Front Panel Boards section 68P81045E84 for information on Front Panel Interconnect Board and Display Boards. These are the same in Remote Mount radios as those used in Front Mount radios.

REMOTE FRONT PANEL BOARDS

REMOTE SWITCH BOARD AND
REMOTE RADIO SET CABLING DIAGRAMS

REMOTE SWITCH BOARD



NOTES:

1. Resistor values given in ohms, capacitor values given in microfarads (uF), unless otherwise stated.
2. Busy light not used in carrier squelch or PL squelch with encode only models.
3. R2256-R2259 in 32-channel models only (TRN4767A).
4. Refer to Microphone instruction section for parts list and information.
5. J2388 used in "Select 5" signaling models with thumbwheel switch options only.
6. For display blanking option JU2250 and JU825 (display board) are cut, and wire jumper JU850 is added between display board and switch board. R819 is added (part of TRN4698A Display Blanking Kit).
7. S805 and S806 are mounted directly to front panel; Refer to signaling switch chart for function and kits.
8. Function and position of switches designated S801, S803, and S804 change with option or model configuration. Refer to Signaling Switch Chart.

SIGNALING SWITCH CHART

Switch Desig.	Symbol	Type	Button/Switch Kit	Function
S801		Latching	TRN4660A	Select 5 Monitor
S803		Latching	TRN4660A	PL/DPL Monitor
		Latching	TRN4656A	Secondary Call/ External Alarm
		Momentary	TRN4658A	Select 5 Call
	1	Momentary	TRN4657A	Single Tone Repeater
S804		Momentary	TRN4658A	Select 5 Call
	GRAY	Momentary	TRN4659A	5-Tone Repeater
S805	I	Momentary	TRN4994A & TRN6468A	Single Tone Repeater
S806	II	Momentary	TRN4994A & TRN6468A	2-Single Tone Repeater

JUMPER CHART

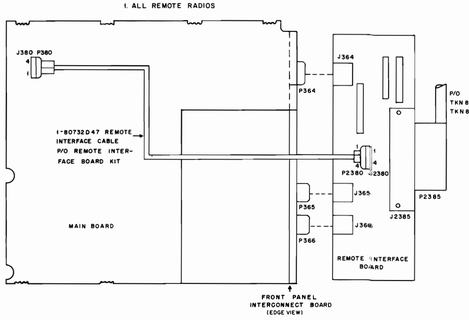
JU2250	Cut For Display Blanking Option
JU2251	Cut For Option
JU2252	IN When S803 Is Latching Switch
JU2253	IN When S803 Is Momentary Contact Switch

LEGEND

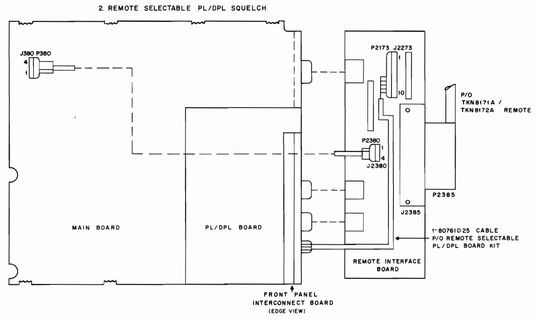
- THEORY NOTE
- SIGNAL FLOW
- PIN AND SLEEVE CONNECTION
- LOGIC GROUND
- GROUND
- CIRCUIT BOARD SOLDER CONNECTION
- WIRE JUMPER
- PLATED JUMPER

REMOTE RADIO SET CABLING

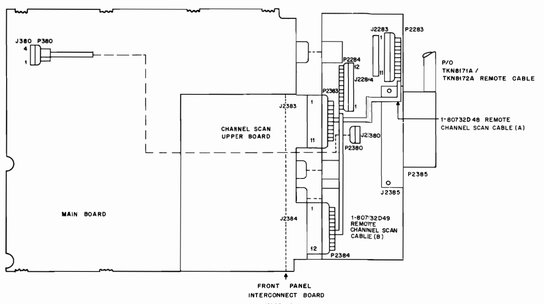
1. ALL REMOTE RADIOS



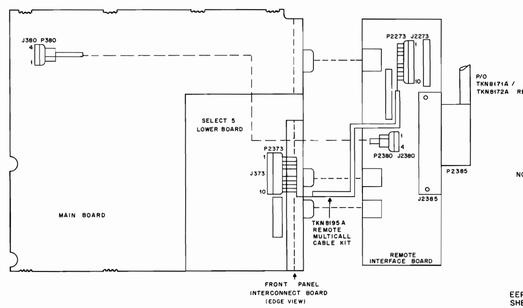
2. REMOTE SELECTABLE PL/DPL SQUELCH



3. REMOTE CHANNEL SCAN MONITOR



4. REMOTE SELECT 5 SIGNALING WITH MULTICALL



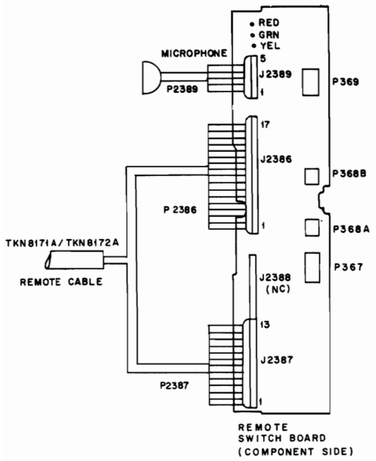
NOTES:

1. REFER TO APPROPRIATE SCHEMATIC DIAGRAMS FOR CABLE WIRE COLORS, SIGNAL NAMES, AND PARTS LISTS.
2. THIS DRAWING ILLUSTRATES REMOTE RADIO INTER CABLING AND INTERCONNECTION. NON-RELATED CONNECTIONS NOT SHOWN. PARTS SHOWN ARE FOR ORIENTATION.

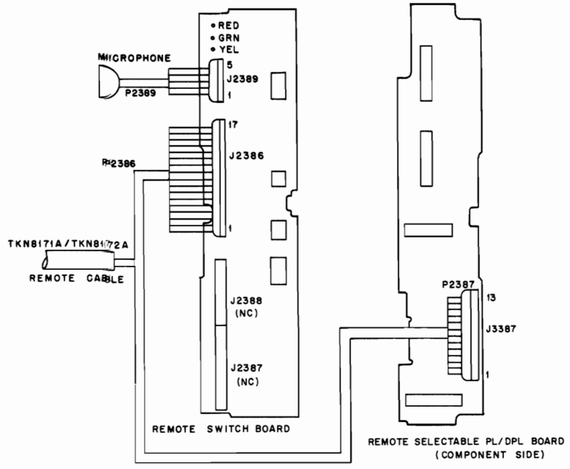
EEPS-32610-O
SHEET 1 OF 2

REMOTE CONTROL HEAD CABLING

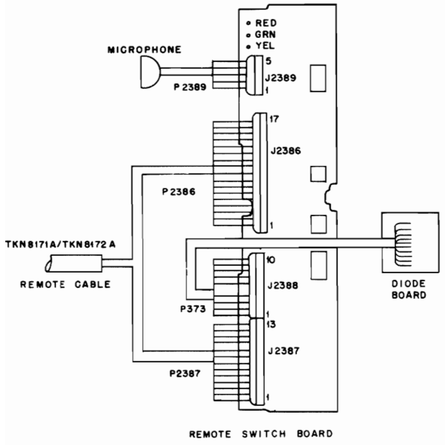
5. BASIC REMOTE CONTROL HEAD



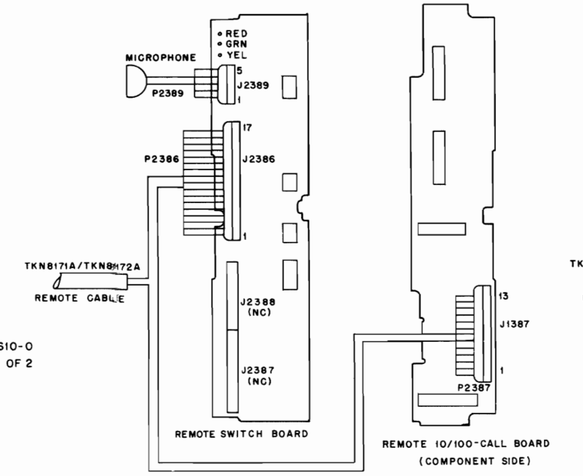
6. REMOTE SELECTABLE PL/DPL



7. REMOTE SELECT 5
WITH THUMBWHEEL SWITCHES

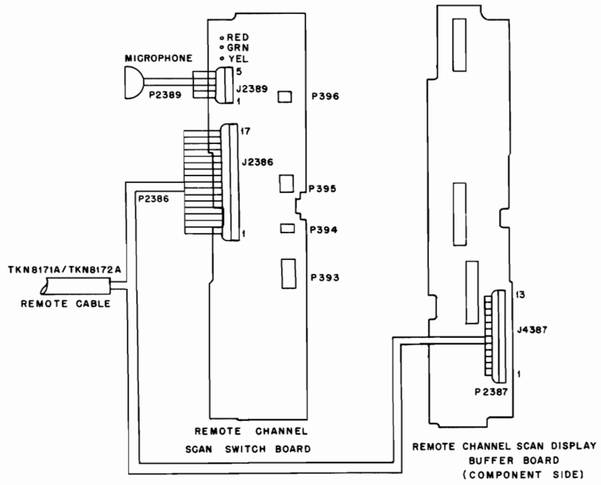


8. REMOTE SELECT 5 WITH 10/100-CALL



*EEPS-32610-0
SHEET 2 OF 2

9. REMOTE CHANNEL SCAN

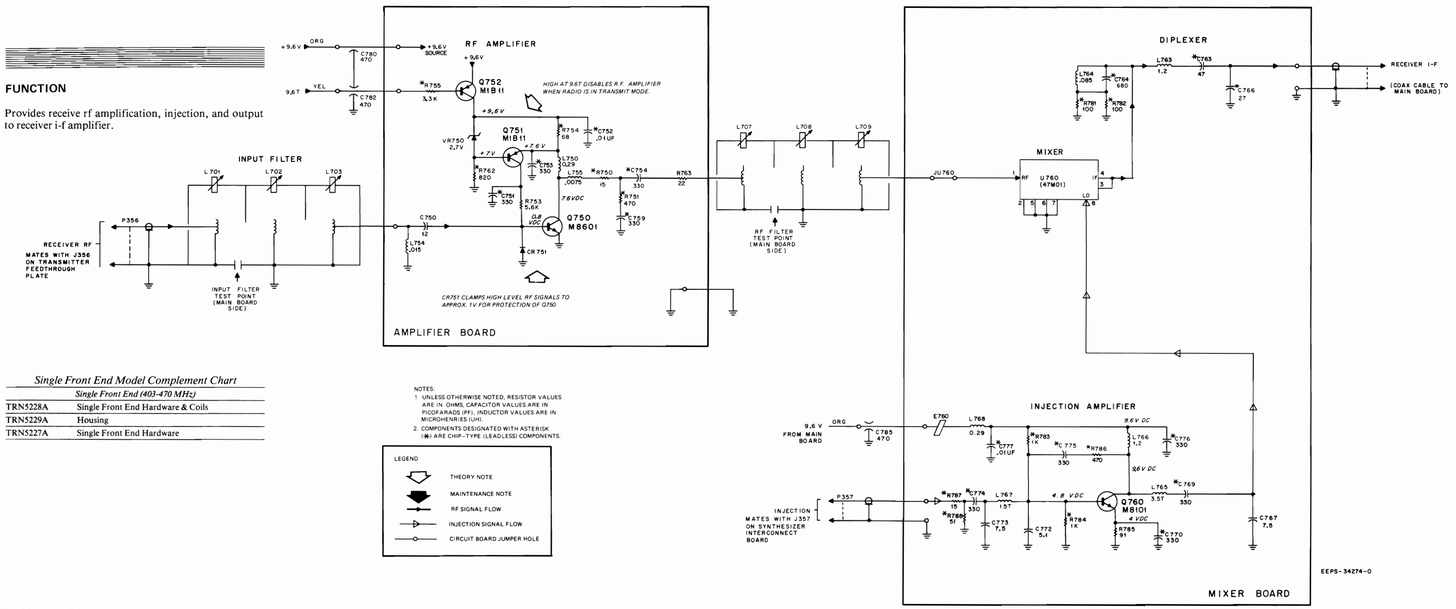


SINGLE FRONT END

MODEL TLE2291A (403-470 MHz)

FUNCTION

Provides receive rf amplification, injection, and output to receiver i-f amplifier.



NOTES:

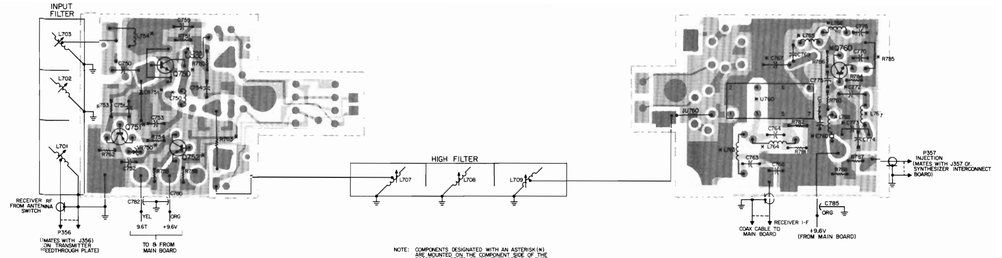
1. UNLESS OTHERWISE NOTED, RESISTOR VALUES ARE IN OHMS, CAPACITOR VALUES ARE IN PICOFARADS (PF), INDUCTOR VALUES ARE IN MICROHENRIES (UH).
2. COMPONENTS DESIGNATED WITH ASTERISK (*) ARE CHIP-TYPE (LEADLESS) COMPONENTS.

LEGEND

- THEORY NOTE
- MAINTENANCE NOTE
- RF SIGNAL FLOW
- INJECTION SIGNAL FLOW
- CIRCUIT BOARD JUMPER HOLE

Single Front End Model Complement Chart

	Single Front End (403-470 MHz)
TRN5228A	Single Front End Hardware & Coils
TRN5229A	Housing
TRN5227A	Single Front End Hardware



NOTE: COMPONENTS DESIGNATED WITH AN ASTERISK (*) ARE MOUNTED ON THE OPPOSITE SIDE OF THE BOARD AS SHOWN. COMPONENTS ARE CHIP TYPE AND ARE MOUNTED ON THE SOLDER SIDE.

SHOWN FROM COMPONENT SIDE

SOLDER SIDE - 80-DEPS-34281-O
COMPONENT SIDE - 80-DEPS-34280-O
OL-DEPS-34275-O

parts list

TRN5228A Single Front End Hardware & Coils — PL-8095-O

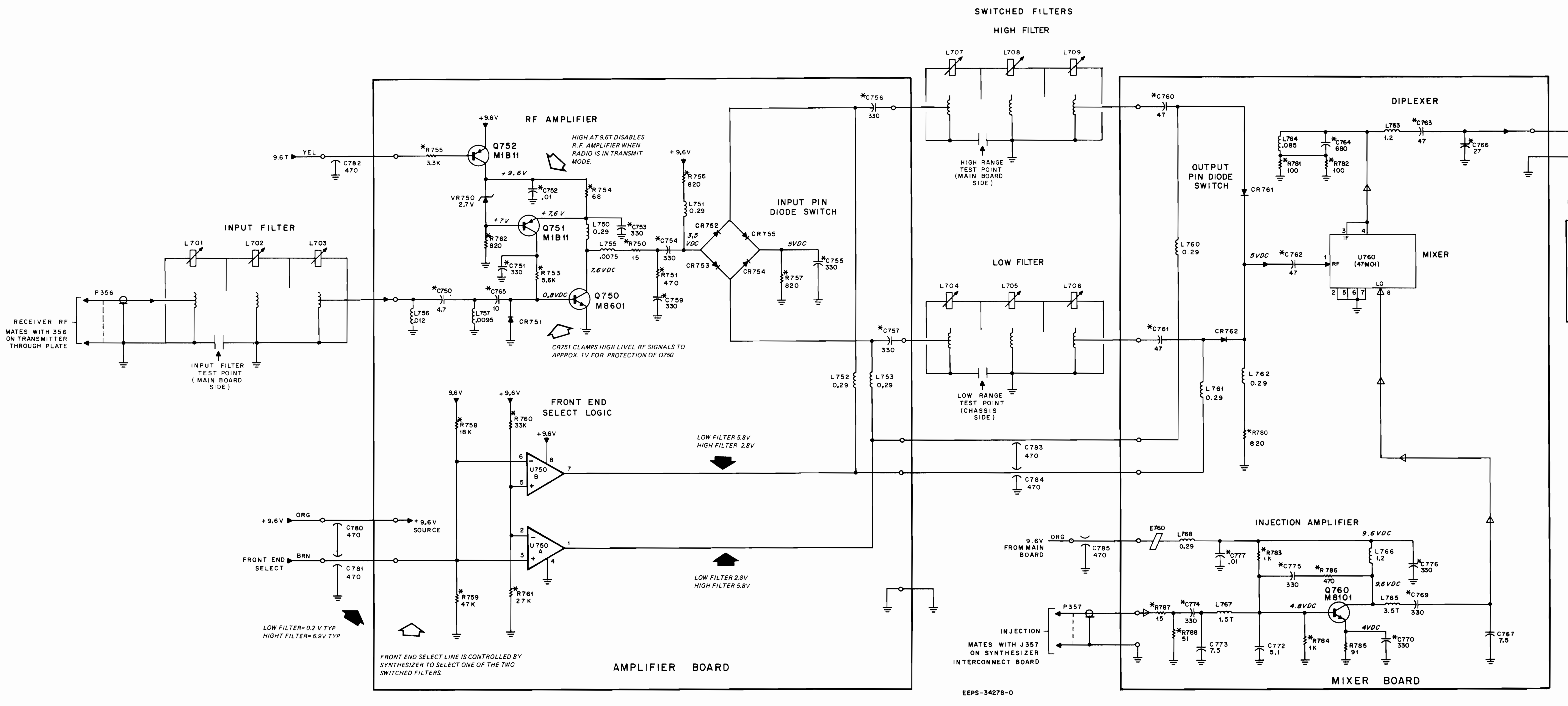
REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed:
C750	21-11022G32	12 pF ± 5%; 50 V
C751	21-11032A03	330 pF ± 10%; 50 V (chip)
C752	21-11032A21	.01 uF ± 10%; 50 V (chip)
C753, 754	21-11032A01	330 pF ± 10%; 50 V (chip)
C759	21-11032A03	330 pF ± 10%; 50 V (chip)
C763	21-11031B31	47 pF ± 5%; 50 V (chip)
C764	21-11031F59	680 pF ± 5%; 50 V (chip)
C766	21-11031A25	27 pF ± 5%; 50 V (chip)
C767	21-11022G24	7.5 pF ± 0.5 pF; 50 V
C769, 770	21-11032A03	330 pF ± 10%; 50 V (chip)
C772	21-11022G18	5.1 pF ± 0.5 pF; 50 V
C773	21-11022G24	7.5 pF ± 0.5 pF; 50 V
C774, 775, 776	21-11032A03	330 pF ± 10%; 50 V (chip)
C777	21-11032A21	.01 uF ± 10%; 50 V (chip)
C780	21-84874K01	470 pF ± 20%; 500 V; feed-thru
C782	21-84874K01	470 pF ± 20%; 500 V; feed-thru
C785	21-84874K01	470 pF ± 20%; 500 V; feed-thru
		diode; (see note)
CR751	48-83654H01	silicon
		coil, rf:
L701	24-00077M03	input helical
L702	24-00077M01	input helical
L703	24-00077M02	input helical
L707	24-00077M21	helical high
L708	24-00077M01	helical high
L709	24-00077M22	helical high
L750	24-82723H20	choke; 0.29 uH
L754, 755	24-00080M05	choke; .015 uH
L763	24-82723H01	choke; 1.2 uH
L764	24-82723H13	choke; 085 uH
L765	24-00080M06	3.5 turns
L766	24-82723H01	choke; 1.2 mH
L767	24-00080M07	1.5 turns
L768	24-82723H20	choke; 0.29 uH
		connector, plug:
P356, 357	28-82365D03	male; single contact
		transistor; (see note)
Q750	48-00086M01	NPN; type M8601
Q751, 752	48-02081B11	PNP; type M1B11
Q760	48-00081M01	NPN; type M8101
		resistor, fixed: ± 5%; 1/8 W: unless otherwise stated
R750	6-11024A05	15 (chip)
R751	6-11024A41	470 (chip)
R753	6-11024A67	5.6k (chip)
R754	6-11024A21	3.3k (chip)

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
R755	6-11024A61	3.3k (chip)
R762	6-11024A47	820 (chip)
R763	6-185A09	22
R781, 782	6-11024A25	100 (chip)
R783, 784	6-11024A49	1k (chip)
R785	6-11020A24	91; 1/4 W
R786	6-11024A41	470 (chip)
R787	6-11024A05	15 (chip)
R788	6-11024A18	51 (chip)
		integrated circuit: (see note)
U760	51-00047M01	mixer
		voltage regulator: (see note)
VR750	48-82256C33	Zener type; 2.7 V
		mechanical parts
	3-84208M01	SCREW, taprite: M3 x 0.5 x 8; 2 used
	3-84208M03	SCREW, taprite: M2.5 x 0.5 x 6; 6 used
	15-84118M01	HOUSING, cover
	30-83361G01	CABLE, coaxial
	30-83794C01	CABLE, coaxial

note: For optimum performance, diodes, transistors, and integrated circuits must be ordered by Motorola part numbers.

TRN5227A Single Front End Hardware — PL-8094-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
	2-84723E02	NUT, tension; 8-32; 6 used
	3-84208M01	SCREW, taprite: M3 x 0.5 x 8; 3 used
	3-84208M03	SCREW, taprite: M2.5 x 0.5 x 6; 11 used
	3-84569G02	SCREW, machine: 8-32 x 7/16"; 6 used
	15-84119M02	HOUSING
	54-00068M01	CAUTION, label



LEGEND:

(open arrow)	THEORY NOTE
(solid arrow)	MAINTENANCE NOTE
(arrow line)	RF SIGNAL FLOW
(open arrow line)	INJECTION SIGNAL FLOW
(circle line)	CIRCUIT BOARD JUMPER HOLE

NOTES:
1. UNLESS OTHERWISE NOTED, RESISTOR VALUES ARE IN OHMS, CAPACITOR VALUES ARE IN PICOFARADS (PF), INDUCTOR VALUES ARE IN MICROHENRIES (UH).
2. COMPONENTS DESIGNATED WITH ASTERISK (✱) ARE CHIP–TYPE (LEADLESS) COMPONENTS.

parts list

TRN5220A Dual Front End Hardware and Coils PL-8097-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed:
C750	21-11031A09	4.7 pF ± 0.25 pF; 50 V (chip)
C751	21-11032A03	330 pF ± 10%; 50 V (chip)
C752	21-11032A21	.01 uF ± 10%; 50 V (chip)
C753 thru 757	21-11032A03	330 pF ± 10%; 50 V (chip)
C759	21-11032A03	330 pF ± 10%; 50 V (chip)
C760 thru 763	21-11031B31	47 pF ± 5%; 50 V (chip)
C764	21-11031F59	680 pF ± 5%; 50 V (chip)
C765	21-11031A15	10 pF ± 0.5 pF; 50 V (chip)
C766	21-11031A25	27 pF ± 5%; 50 V (chip)
C767	21-11022G24	7.5 pF ± 0.5 pF; 50 V
C769, 770	21-11032A03	330 pF ± 10%; 50 V (chip)
C772	21-11022G18	5.1 pF ± 0.5 pF; 50 V
C773	21-11022G24	7.5 pF ± 0.5 pF; 50 V
C774 thru 776	21-11032A03	330 pF ± 10%; 50 V (chip)
C777	21-11032A21	.01 uF ± 10%; 50 V (chip)
C780 thru 785	21-84874K01	470 pF ± 20%: 500 V; (feedthru)
		diode: (see note)
CR751	48-83654H01	silicon
CR752 thru 755	48-00082M01	silicon
CR761, 762	48-00087M01	silicon
		coil, rf:
L701	24-00077M03	input, helical
L702	24-00077M01	input, helical
L703	24-00077M02	input, helical
L704	24-00077M11	injection, helical low
L705	24-00077M01	injection, helical low
L706	24-00077M11	injection, helical low
L707	24-00077M21	helical high
L708	24-00077M01	helical high
L709	24-00077M22	helical high
L750 thru 753	24-82723H20	choke; 0.29 uH
L755	24-00080M05	choke; .015 uH
L756	24-00080M11	choke; 0.012 uH
L757	24-00090M07	choke; 0.0095 uH
L760 thru 762	24-82723H20	choke; 0.29 uH
L763	24-82723H01	choke; 1.2 uH
L764	24-82723H18	choke; .085 uH
L765	24-00080M06	3.5 turns
L766	24-82723H01	choke; 1.2 uH
L767	24-00080M07	1.5 turns
L768	24-82723H20	choke; 0.29 uH
		connector, plug:
P356, 357	28-82365D03	male; single contact
		transistor: (see note)
Q750	48-00086M01	NPN; type M8601
Q751, 752	48-02081B11	PNP; type M1B11
Q760	48-00081M01	NPN; type M8101

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		resistor, fixed: ± 5%; 1/8 W: unless otherwise stated
R750	6-11024A05	15 (chip)
R751	6-11024A41	470 (chip)
R753	6-11024A67	5.6k (chip)
R754	6-11024A21	68 (chip)
R755	6-11024A61	3.3k (chip)
R756, 757	6-11024A47	820 (chip)
R758	6-11024A79	18k (chip)
R759	6-11024A89	47k (chip)
R760	6-11024A85	33k (chip)
R761	6-11024A83	27k (chip)
R762	6-11024A47	820 (chip)
R780	6-11024A47	820 (chip)
R781, 782	6-11024A25	100 (chip)
R783, 784	6-11024A49	1k (chip)
R785	6-11020A24	91; 1/4 W
R786	6-11024A41	470 (chip)
R787	6-11024A05	15 (chip)
R788	6-11024A18	51 (chip)
		integrated circuit: (see note)
U750	51-80067C03	dual operation amplifier
U760	51-00047M01	mixer
		voltage regulator: (see note)
VR750	48-82256C33	Zener type; 2.7 V
		mechanical parts
	3-84208M03	SCREW, taptite; M2.5 × 5 × 6; 6 used
	15-84118M01	COVER, tuning
	76-83960B01	FERRITE, bead
	30-83361G01	CABLE, coaxial
	30-83794C01	CABLE, coaxial

note: For optimum performance, diodes, transistors, and integrated circuits must be ordered by Motorola part numbers.

TRN5227A Dual Front End Hardware Kit PL-8096-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
	2-84773E02	NUT, tension: 8-32: 9 used
	3-84208M01	SCREW, taptite: M3 × 0.5 × 8; 2 used
	3-84208M03	SCREW, taptite: M2.5 × 0.5 × 6; 11 used
	3-84589G02	SCREW, machine: 8-32 × 7/16"; 9 used
	54-00068M01	CAUTION, label

DUAL FRONT END

MODELS TLE2261A (403-470 MHz)

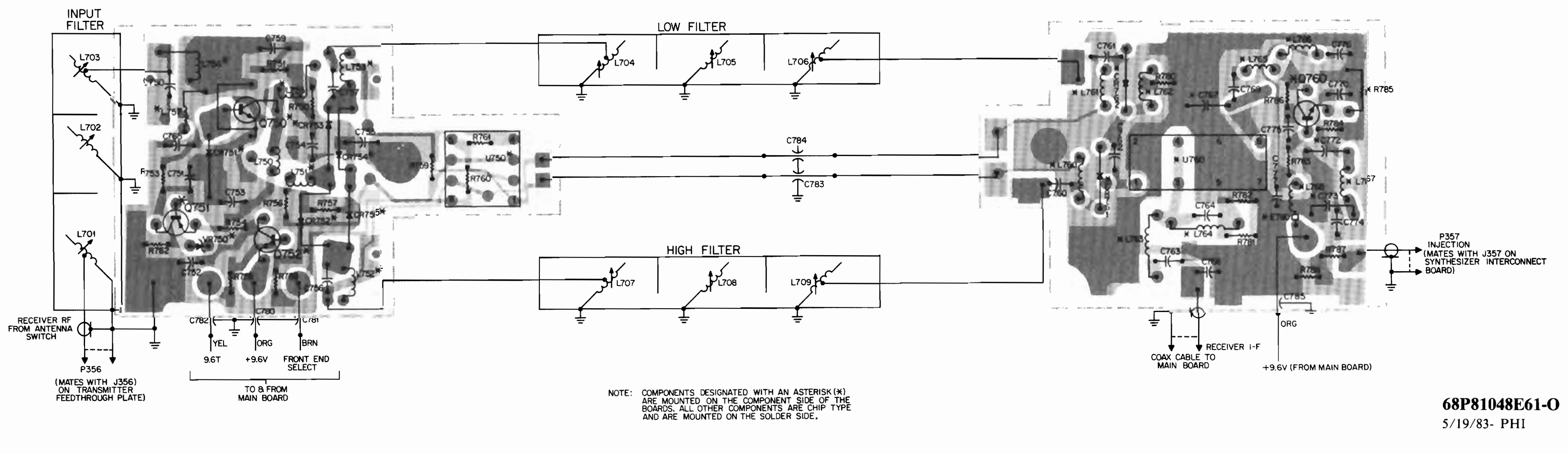
FUNCTION

Provides extended frequency coverage by switching between two three-cell helical filters. The filters may be tuned independently within the operating frequency of the radio. Switching between the ranges is controlled by the Front End Select line from the synthesizer.

Output is at the receiver intermediate frequency (i-f).

Widespace Dual Front End
Model Complement Chart

TLE2261A Dual Front-End (403-470 MHz)	
TRN5220A	Hardware and Coils
TRN5221A	Housing
TRN5227A	Dual Front End Hardware



NOTE: COMPONENTS DESIGNATED WITH AN ASTERISK (✱) ARE MOUNTED ON THE COMPONENT SIDE OF THE BOARDS. ALL OTHER COMPONENTS ARE CHIP TYPE AND ARE MOUNTED ON THE SOLDER SIDE.

SHOWN FROM COMPONENT SIDE

SOLDER SIDE = 8D-DEPS-34281-O
COMPONENT SIDE = 8D-DEPS-34280-O
OL-DEPS-34279-O

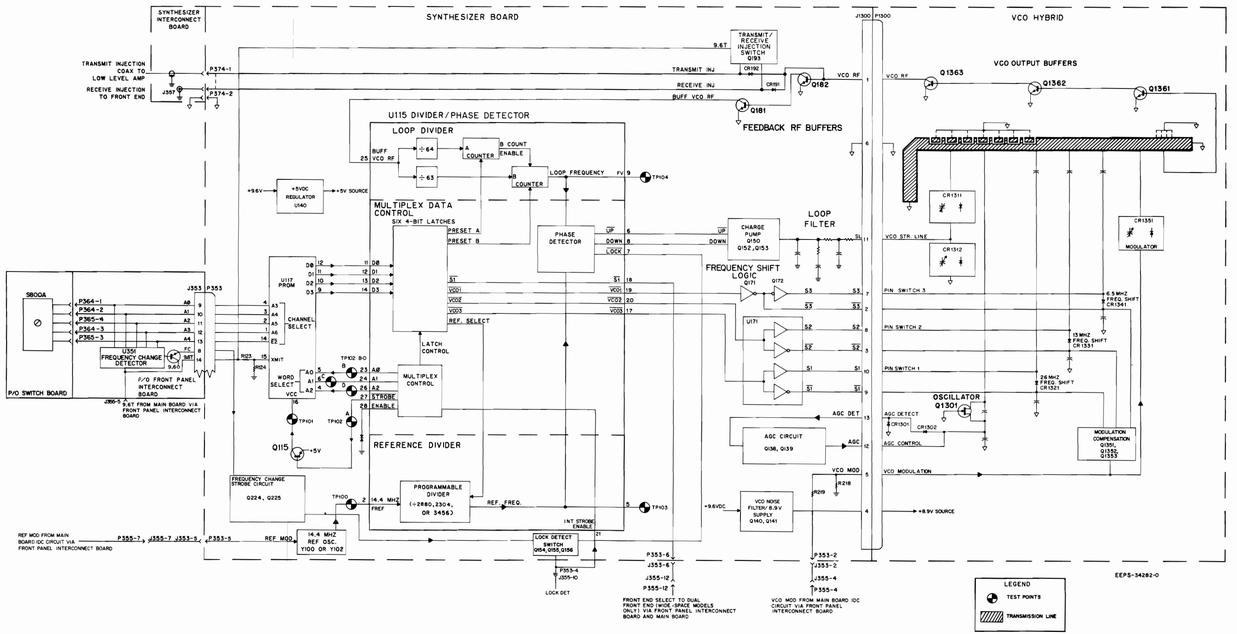
DUAL FRONT END

68P81048E61-O
5/19/83- PHI

STANDARD LOCK FREQUENCY SYNTHESIZER

FUNCTIONAL INTERCONNECT DIAGRAM AND PARTS LIST

SYNTHESIZER FUNCTIONAL INTERCONNECT DIAGRAM



68P81048E62-O
(Sheet 1 of 3)
5/19/83- PHI

parts list

TRN5440A Standard Lock Synthesizer Board (5 ppm)
TRN5376A Standard Lock Synthesizer Board (2 ppm) PL-8025-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed: pF ± 5%; 50 V: unless otherwise stated
C105	21-11031A26	30
C106	21-11032A21	.01 uF ± 10%
C109	21-11031A26	30
C110	21-11031A39	100
C111	21-11032A21	.01 uF ± 10%
C112	21-11032A21	.01 uF ± 10%
C113	21-11025A01	1.0 uF ± 20%; 25 V (TRN5376A only)
C114	21-84511B01	100; 10% (TRN5376A only)
C115	21-11031A39	100
C116	21-11031A26	30
C117	21-11032A21	.01 uF ± 10%
C118	21-11031A39	100
C119, 120	21-11032A21	.01 uF ± 10%
C121	21-11031A39	100
C122	21-11032A21	.01 uF ± 10%
C124	21-11032A21	.01 uF ± 10%
C125	21-11031A26	30 pF
C126	21-11031A26	30 pF
C127	21-11031A39	100
C128	21-11031A26	30
C129	21-11031A39	100
C130	21-11031A26	30
C133	21-11031A26	30
C134	23-11019A09	1 uF ± 20%
C135	23-11019A17	4.7 uF ± 20%
C136	21-11032A21	.01 uF ± 10%
C140	21-11032A21	.01 uF ± 10%
C141	21-11031A26	30
C142, 143	23-11019A27	22 uF ± 20%
C144	21-11032A21	.01 ± 10%
C145	21-11031A26	30
C146, 147	21-11032A21	.01 uF ± 10%
C148	23-8239701E	22 uF ± 20%; 15 V
C149	23-84538G03	0.1 uF ± 20%; 35 V
C150	23-84538G02	6.8 uF ± 20%; 20 V
C151	8-84637L42	0.47 uF ± 10%; 100 V
C152	8-11023A17	.022 uF ± 20%
C154	21-11032A21	.01 uF ± 10%
C155	23-11019A27	22 uF ± 20%
C156	23-84538G03	0.1 uF
C157	21-11031A26	30
C159	21-11031A26	30
C160, 161	21-11031A39	100
C168	21-11032A21	.01 uF
C181	21-11031A26	30
C182, 183	21-11031A05	2.2 ± 0.25 pF
C184, 185	21-11031A26	30
C186	23-11019A27	22 uF ± 70%
C187	21-11031A07	3.3
C188 thru 191	21-11031A26	30
C192	21-11031A07	3.3 ± 0.25 pF
C193	21-11031A26	30
C194	21-11031A05	2.2
C196	21-11032A21	.01 uF ± 10%
C197	21-11031A26	30
C199	21-11032A21	.01 uF ± 10%
C200	21-11031A26	30
C205	23-11019A45	100 uF ± 20%; 16 V
C210 thru 216	21-11031A39	100
C217	21-11031A26	30
C218	21-11032A21	.01 uF ± 10%
C219, 220	21-11031A39	100
C223	21-11031A39	100
C224	21-11032A21	.01 uF ± 10%; 50 V
C270 thru 283	21-84874K01	470 pF; feed-thru
		diode: (see note)
CR140 thru 144	48-84399M01	silicon
CR158, 159	48-84399M01	silicon
CR191, 192	48-83510F05	current control
		connector, receptacle:
J1300	9-84321M01	female; 13-contact
		coil, rf:
L100	24-82723H27	choke; 2.6 uH (TRN5376A only)
L101	24-82723H19	choke; 1.2 uH (TRN5376A only)
L102	24-82549D41	choke; 100 uH
L115	24-82723H28	choke; 290 nH
L150	24-82549D41	100 uH
L180	24-82723H31	25 nH
L181	24-82723H28	290 nH
L182	24-82723H29	39 nH
L190	24-82723H28	290 nH
L191	24-82723H31	25 nH
L192 thru 194	24-82723H28	290 nH
L195, 196	24-82723H31	25 nH
L210 thru 213	24-82723H28	290 nH
L220, 221	24-82723H28	290 nH
		connector, plug:
P374	28-82040K05	male; 3-contact

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		transistor: (see note)
Q115	48-869681	PNP; type M9681
Q138, 139	48-869642	NPN; type M9642
Q140	48-869681	PNP; type M9681
Q141	48-869642	NPN; type M9642
Q150	48-869570	NPN; type M9570
Q152	48-869571	PNP; type M9571
Q153	48-869570	NPN; type M9570
Q154	48-869643	PAD; 2 used
Q155, 156	48-869642	NPN; type M9642
Q171	48-869642	NPN; type M9642
Q172	48-869643	PNP; type M9643
Q181, 182	48-869658	NPN; type M9658
Q193	48-869643	PNP; type M9643
Q224, 225	48-869642	NPN; type M9642
		resistor, fixed: ± 5%; 1/8 W: unless otherwise stated
R102	6-11024A49	1k
R103	6-11024A09	22
R105	6-11024A77	15k
R115, 116, 117	6-11024A73	10k
R118 thru 122	6-11024A79	18k
R123	6-11024A61	3.3k
R124	6-11024A55	1.8k
R125	6-11024A45	680
R126	6-11024A41	470
R127	6-11024A49	1k
R133	6-11024A29	150
R134	6-11024A61	3.3k
R136	6-11024A73	10k
R137	6-11024A11	27
R138	6-11024A61	3.3k
R140	6-11024A45	680
R141	6-11024A35	270
R142	6-11024A73	10k
R143	6-11024A71	8.2k
R144	6-11024A55	1.8k
R145	6-11024A18	51
R150	6-11024A41	470
R151	6-11024A53	1.5k
R152	6-11024A23	82
R153	6-11024A25	100
R154	6-11024A45	680
R155	6-11024A61	3.3k
R156	6-11024A45	680
R157	6-11024A69	6.8k
R158	6-11024A71	8.2k
R159, 160	6-11024A57	2.2
R161	6-11024A45	680
R162	6-11024A63	3.9k
R163	6-11024A23	82
R164	6-11024A59	2.7k
R165	6-11024A25	100
R166	6-11024A43	560
R167	6-11024A59	2.7k
R168	6-11024A87	39k
R172	6-11024A73	10k
R173, 174	6-11024A89	47k
R175	6-11024A49	1k
R176	6-11024A55	4.7k
R178	6-11024A65	4.7k
R179	6-11024A49	1k
R180	6-11024A18	51
R181	6-11024A17	47
R182	6-11024A45	680
R183	6-11024A29	150
R184	6-11024A01	10
R185	6-11024A57	2.2k
R186	6-11024A37	330
R187	6-11024A57	2.2k
R189	6-11024A33	220
R190	6-11024A09	22
R191	6-11024A61	3.3k
R192	6-11024A51	1.2k
R193	6-11024A33	220
R210	6-11024A25	100
R212	6-11024A25	100
R216	6-11024A25	100
R217	6-11024A85	33k
R218	6-11024A55	4.7k
R219	6-11024A91	56k
R223	6-11024A69	6.8k
R224	6-11024A49	1k
R225	6-11024A55	4.7k
R226	6-11024A61	3.3k
R228	6-11024A89	47k
		integrated circuit: (see note)
U115	51-83977M37	divider/phase detector
U117	51-84689L03	prom; 256 × 4
U140	51-83629M17	5 V regulator
U171	51-83627M53	line driver
		crystal: (see note)
Y101	48-82230P01	5 ppm channel element (TRN5440A only)
Y102	51-80291B02	2 ppm channel element (TRN5376A only)

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		mechanical parts
	3-84208M01	SCREW
	3-84208M03	SCREW
	9-80269B01	SOCKET, prom
	9-80269B03	SOCKET
	29-94322M01	TERMINAL, feed-thru; 14 used
	55-84210M01	HANDLE
	64-84111M01	PLATE, feed-thru
	75-84112M01	PAD; 2 used
	7-83091N01	BRACKET, board mounting
	28-83186M02	CONNECTOR, male; 4-contact, right-angle (p/o 2 ppm channel element assembly)

note: For optimum performance, diodes, transistors, and integrated circuits must be ordered by Motorola part numbers.

TRN4666A PROM Kit PL-7779-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
(varies with application)	51-80070C01	256 x 4

note: This is part number of non-programmed PROM module. Order programmed PROM modules from factory on *MCX100* Supplementary Order Form.

TRN4670A PROM Kit, 32-Channel PL-7787-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
U117	51-80070C03	32-channel PROM (standard lock)
U116	51-80070C03	32-channel PROM (triple lock)

note: This is part number of non-programmed PROM module. Order programmed PROM modules from factory on *MCX100* Supplementary Order Form.

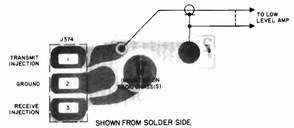
TRN5366A Synthesizer Interconnect Board PL-8026-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		connector, receptacle:
J374	29-10134A29	female; 3 used
	26-84103M01	SHIELD

STANDARD LOCK FREQUENCY SYNTHESIZER

CIRCUIT BOARD DETAILS

SYNTHESIZER INTERCONNECT BOARD

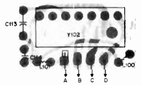


SOLDER SIDE - BD-AEPS-34291-O
COMPONENT SIDE - BD-AEPS-34290-O
OL-AEPS-34289-O

5 PPM CHANNEL ELEMENT PIN DETAIL

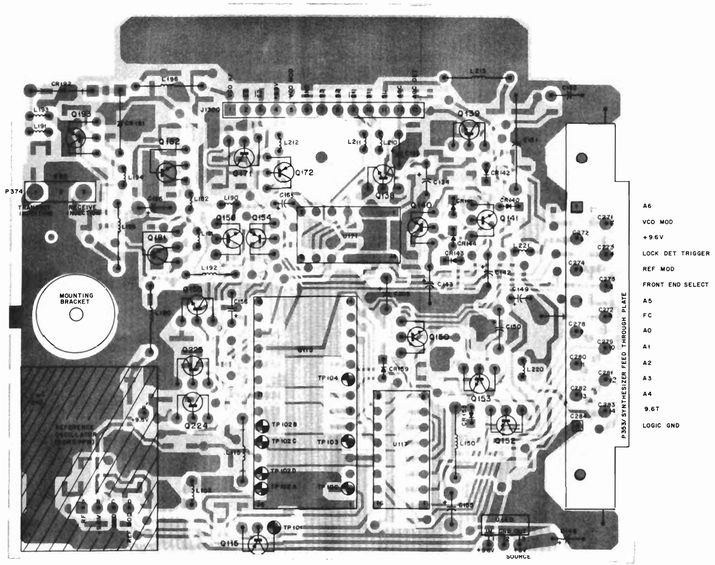
AEPS-34288-O

2 PPM CHANNEL ELEMENT BOARD



SOLDER SIDE - AEPS-30419-O
COMPONENT SIDE - AEPS-30417-O
OL - AEPS-30416-B

TRN5440A/TRN5376A SYNTHESIZER BOARD (COMPONENT SIDE COMPONENTS)

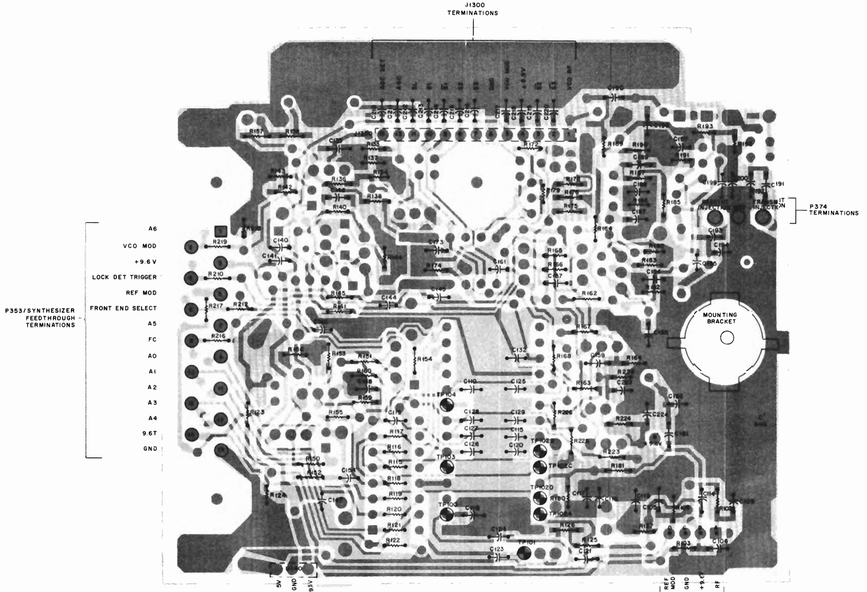


COMPONENT SIDE - BD-DEPS-34285-O
SOLDER SIDE - BD-DEPS-34286-O
OL-DEPS-34284-O

SHOWN FROM COMPONENT SIDE

LEGEND:
TEST POINT

TRN5440A/TRN5376A SYNTHESIZER BOARD (SOLDER SIDE CHIP COMPONENTS)



COMPONENT SIDE - BD-DEPS-34285-O (REVERSED)
SOLDER SIDE - BD-DEPS-34286-O (REVERSED)
OL-DEPS-34287-O

SHOWN FROM SOLDER SIDE

NOTE
ALL COMPONENTS MOUNTED ON SOLDER SIDE ARE CHIP-TYPE

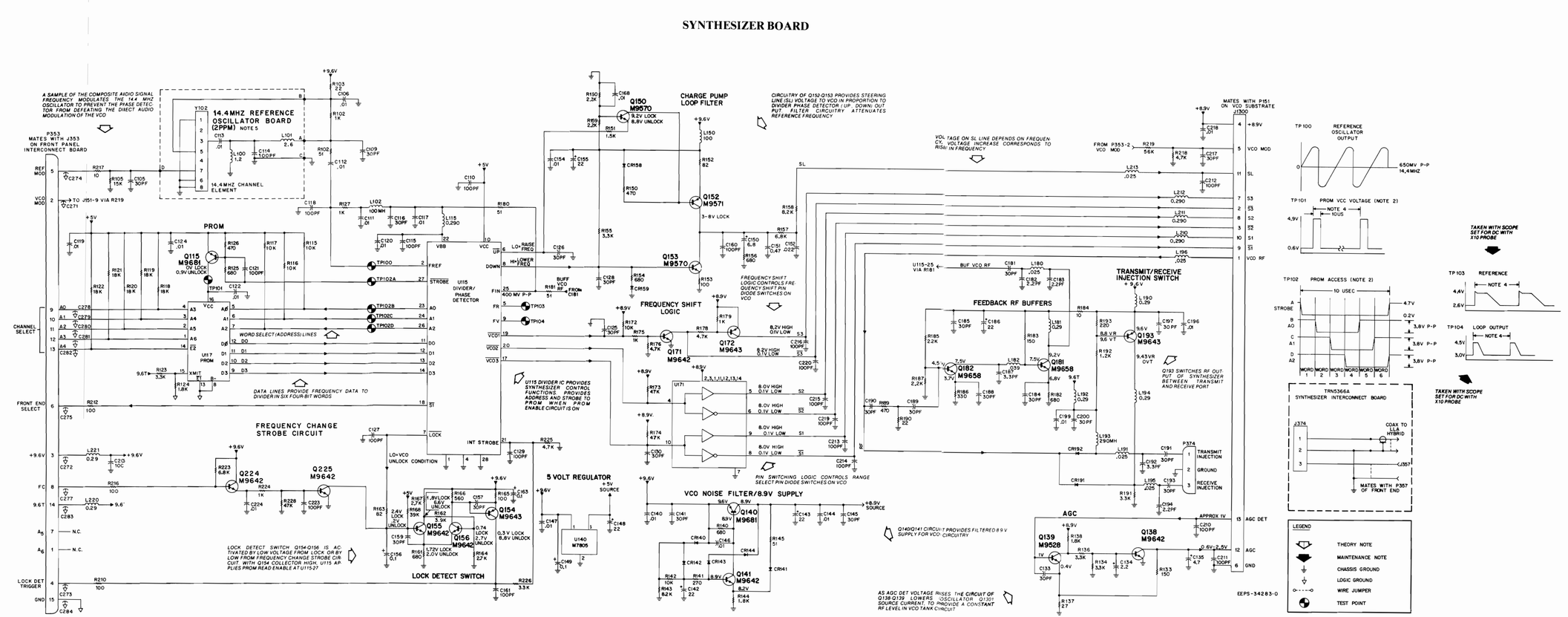
LEGEND:
TEST POINT

STANDARD LOCK FREQUENCY SYNTHESIZER

SYNTHESIZER BOARD
SCHEMATIC DIAGRAM

FUNCTION

Generates mixer injection signal in receive mode, and low level modulated rf in transmit mode.

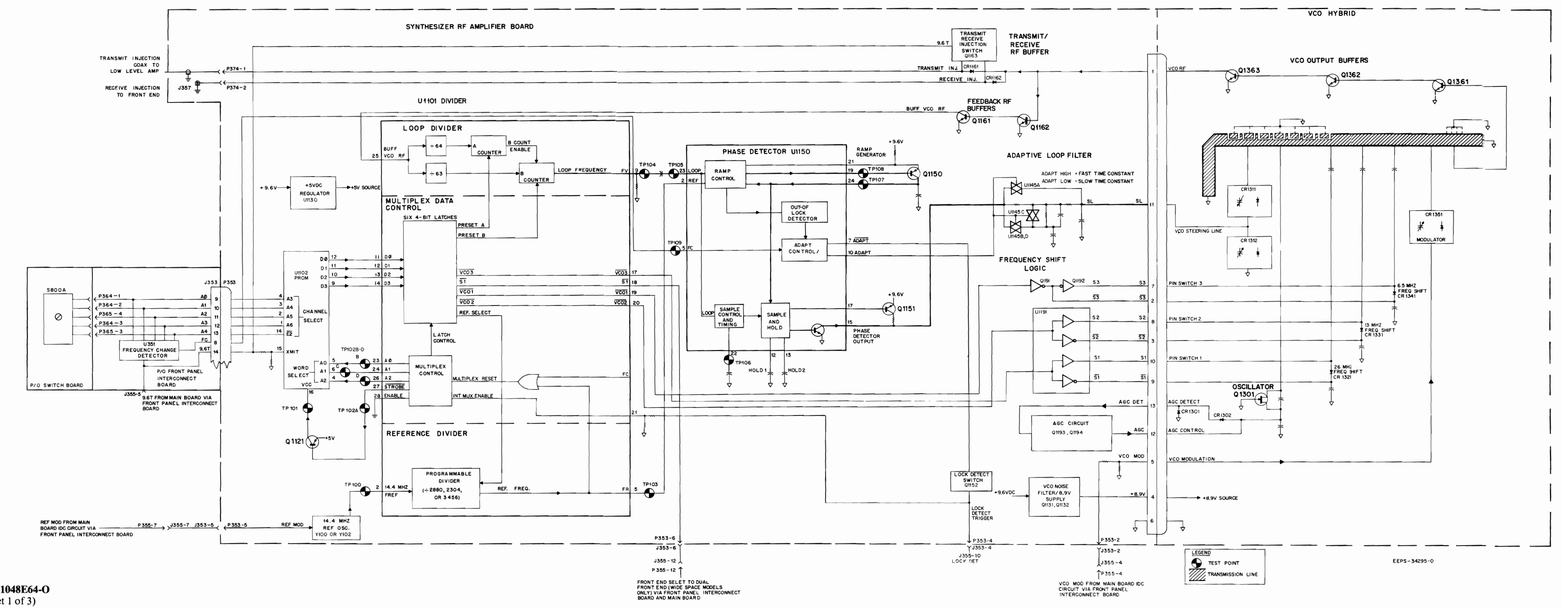


68P81048E62-O
(Sheet 3 of 3)
5/19/83- PHI

FREQUENCY SYNTHESIZER

FAST—LOK
FREQUENCY SYNTHESIZER
FUNCTIONAL INTERCONNECT DIAGRAM
AND PARTS LIST

SYNTHESIZER FUNCTIONAL INTERCONNECT DIAGRAM



68P81048E64-O
(Sheet 1 of 3)
5/19/83- PHI

parts list

TRN5441A (5 PPM) *Fast Lok* Synthesizer, UHF
TRN5377A (2 PPM) *Fast Lok* Synthesizer, UHF — PL-8028-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed pF ± 5%; 50 V (chip): unless otherwise stated;
C113	21-11025A01	.01 uF ± 20%; 25 V (chip)
C114	21-84511B01	100 pF ± 10%; 50 V (chip)
C1100	21-11031A39	100
C1101	21-11031A26	30
C1102, 1103	21-11032A21	.01 uF ± 10%; 50 V (chip)
C1104	21-11031A39	100
C1105, 1106	21-11032A21	.01 uF ± 10%; 50 V (chip)
C1109	21-11032A23	.01 uF ± 10%; 50 V (chip)
C1110 thru 1114	21-11031A26	30
C1115	21-11032A21	.01 uF ± 10%; 50 V (chip)
C1116	21-11031A26	30 pF ± 10%; 50 V (chip)
C1117	21-11032A21	.01 uF ± 10%; 50 V (chip)
C1121	21-11031A39	100
C1122, 1123	21-11032A21	.01
C1130	23-84538G03	0.1 uF ± 20%; 35 V
C1131	21-11032A21	.01 uF ± 10%; 50 V (chip)
C1132	23-82397D16	22 uF ± 20%; 15 V
C1133	21-11031A26	30
C1134	21-11032A21	.01 uF ± 10%; 50 V (chip)
C1135	23-11019A27	22 uF ± 20%; 25 V
C1136	21-11032A21	.01 uF ± 10%; 50 V (chip)
C1137	23-11019A27	22 uF ± 20%; 25 V
C1138	21-11032A21	.01 uF ± 10%; 50 V (chip)
C1139	21-11031A26	30
C1144, 1146	21-11031A26	30
C1147	21-11032A25	.022 uF ± 10%; 100 V (chip)
C1148	8-83862M05	1 uF ± 10%; 100 V (chip)
C1149	8-83765N01	.033 uF ± 10%; 25 V (chip)
C1150	21-11031A39	100
C1151	23-11019A45	100 uF ± 20%; 16 V (chip)
C1152	21-11032A21	.01 uF ± 10%; 50 V (chip)
C1153	21-11031A39	100
C1154	8-11017B07	.0068 uF ± 10%; 50 V
C1155	8-11017A01	.001 uF ± 10%; 50 V
C1156	8-80027B02	.0047 uF ± 10%; 50 V
C1157	23-11019A27	22 uF ± 20%; 25 V
C1158	8-80027B02	.0047 uF ± 10%; 50 V
C1162	21-11031A26	30
C1163, 1164	21-11031D05	2.2 pF ± .25 pF; 50 V (chip)
C1165	23-11019A27	22 uF ± 20%; 25 V
C1166, 1167	21-11031A26	30
C1168	21-11031A09	4.7 pF ± .25 pF; 50 V (chip)
C1169, 1170	21-11031A26	30
C1171	21-11031A26	30
C1172	21-11031A15	10 pF ± 5 pF; 50 V (chip)
C1173	21-11032A21	.01 uF ± 10%; 50 V (chip)
C1174	21-11032A21	.01 uF ± 10%; 50 V (chip)
C1175	21-11031A26	30
C1176	21-11032A21	.01 uF ± 10%; 50 V (chip)
C1177 thru 1180	21-11031A26	30
C1181	21-11031A05	2.2
C1182	21-11031A07	3.3
C1183	21-11031A39	100
C1184	23-11019A45	100 uF ± 10%; 50 V
C1191	23-11019A11	2.2 uF ± 20%; 50 V
C1192	21-11031A26	30
C1193	21-11019A09	1 uF ± 20%; 50 V
C1194, 1195, 1196	21-11031A26	30
C1201	21-11031A26	30
C1204 thru 1207	21-11031A26	30
C1209 thru 1211	21-11031A26	30
C1270 thru 1293	21-84874K01	470 pF; feed-thru
		diode: (see note)
CR1131 thru CR1161, 1162	48-84399M01	silicon
	48-83510F06	current control
J1300	9-84321M01	**connector, receptacle:** female; 13-contact
		coil, rf:
L101	24-82723H19	2.6 uH
L114	24-82723H27	1.2 uH
L1101	24-82549D41	100 uH
L1104	24-82723H28	290 nH
L1150	24-82549D41	100 uH
L1162	24-82723H31	25 nH
L1163	24-82723H28	290 nH
L1164	24-82723H29	39 nH
L1166	24-82723H28	290 nH
L1167	24-82723H31	25 nH
L1168, 1169	24-82723H28	290 nH
L1170	24-82723H31	25 nH
L1171	24-82723H28	290 nH
L1172	24-82723H31	25 nH
L1220, 1221	24-82723H28	290 nH
P374	28-82040K03	**connector, plug:** male; 3-contact

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		transistor: (see note)
Q1121	48-869681	PNP; type M9681
Q1131	48-869681	PNP; type M9681
Q1132	48-869642	NPN; type M9642
Q1150	48-869548	PNP; type M9548
Q1151, 1152	48-869643	PNP; type M9643
Q1161, 1162	48-869658	NPN; type M9658
Q1162	48-869643	PNP; type M9643
Q1191	48-869642	NPN; type M9642
Q1192	48-869643	PNP; type M9643
Q1193	48-869642	NPN; type M9642
Q1194	48-869528	NPN; type M9528
		resistor, fixed: ± 5%; 1/8 W: unless otherwise stated
R1100	6-11024A09	22 (chip)
R1101, 1102, 1103	6-11024A73	10k (chip)
R1104 thru 1108	6-11024A79	18k (chip)
R1109	6-11024A61	3.3k (chip)
R1110	6-11024A55	1.8k (chip)
R1111	6-11024A41	470 (chip)
R1112	6-11024A45	680 (chip)
R1113	6-11024A65	4.7k (chip)
R1114	6-11024A19	51 (chip)
R1115	6-11024A65	4.7k (chip)
R1116	6-11024A61	3.3k (chip)
R1117	6-11024A49	1k (chip)
R1118	6-11024A19	51 (chip)
R1119	6-11024A77	15k (chip)
R1131	6-11024A45	680 (chip)
R1132	6-11024A73	10k (chip)
R1133	6-11024A71	8.2k (chip)
R1134	6-11024A35	270 (chip)
R1135	6-11024A55	1.8k (chip)
R1136	6-11024A19	51 (chip)
R1147	6-11024A93	6.8k
R1148	6-11024A65	4.7k (chip)
R1149, 1150	6-11024A69	6.8k (chip)
R1151	6-11024A29	150 (chip)
R1152	6-11024A39	390 (chip)
R1153	6-11024A49	1k (chip)
R1154	6-11024A09	22 (chip)
R1155, 1156	6-11024A79	18k (chip)
R1157	6-11024A73	10k (chip)
R1158	6-11024A69	6.8k (chip)
R1161	6-11024A19	51 (chip)
R1162	6-11024A29	150 (chip)
R1163	6-11024A45	680 (chip)
R1164	6-11024A37	330 (chip)
R1165, 1166	6-11024A57	2.2k (chip)
R1167	6-11024A01	10 (chip)
R1168	6-11024A09	22 (chip)
R1169	6-11024A41	470 (chip)
R1171	6-11024A65	4.7k (chip)
R1172	6-11024A35	270 (chip)
R1173	6-11024A61	3.3k (chip)
R1188	6-11009A65	4.7k (chip)
R1189	6-11009A49	1k (chip)
R1190	6-11009A73	10k (chip)
R1191	6-11009A65	4.7k (chip)
R1192	6-11009A49	1k (chip)
R1193	6-11009A55	1.8k (chip)
R1194, 1195	6-11009A91	56k (chip)
R1196	6-11009A11	27 (chip)
R1197, 1198	6-11009A61	3.3k (chip)
R1199	6-11009A29	150 (chip)
R1200	6-11009A11	27 (chip)
R1210, 1216	6-11009A25	100 (chip)
R1217	6-11009A01	10 (chip)
R1218	6-11009A65	4.7k (chip)
R1219	6-11009A91	56k (chip)
R1220	6-11009A25	100 (chip)
		thermistor:
RT1151	6-83600K02	1k @ 25°C
		integrated circuit: (see note)
U1101	51-83977M37	divider
U1102	51-84689L03	PROM; 256 x 4
U1130	51-83620M17	5 V; regulator
U1145	51-80073C02	quad analog switch
U1150	51-83977M23	phase, detector
U1180	51-80073C02	quad analog switch
U1191	51-83627M53	line driver
		crystal: (see note)
Y101	48-82230P01	channel element, 5 PPM (TRN5441A only)
Y102	51-80291B02	channel element, 2 PPM (TRN5377A only)

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		mechanical parts
	3-84208M01	SCREW, machine; M3 x 0.5 x 8
	3-84208M03	SCREW, machine; M2.2 x 0.45 x 6
	7-83091N01	BRACKET
	9-80266B01	SOCKET, prom
	9-80269B03	SOCKET
	29-84322N01	TERMINAL, feed-thru; 14 used
	55-84210M01	HANDLE
	64-84111M01	PLATE
	75-84112M01	PAD; 2 used
	28-83186M02	CONNECTOR, male; 4-contact right angle (p/o 2 PPM channel element assembly)

note: For optimum performance, diodes, transistors, and integrated circuits must be ordered by Motorola part numbers.

TRN4666A PROM Kit — PL-7779-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
(varies with application)	51-80070C01	256 x 4

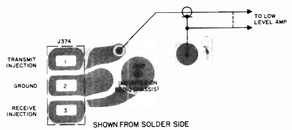
TRN4670A PROM Kit, 32-Channel — PL-7787-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
U117	51-80070C03	32-channel PROM (standard lock)
U116	51-80070C03	32-channel PROM (fast-lock)

note: This is part number of non-programmed PROM module. Order programmed PROM modules from factory on MCX100 Supplementary Order Form.

FAST—LOK
FREQUENCY SYNTHESIZER
CIRCUIT BOARD DETAILS

SYNTHESIZER INTERCONNECT BOARD

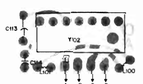


SOLDER SIDE - BD-AEPS-3429H-O
COMPONENT SIDE - BD-AEPS-34290-O
OL-AEPS-34289-O

5 PPM CHANNEL ELEMENT PIN DETAIL

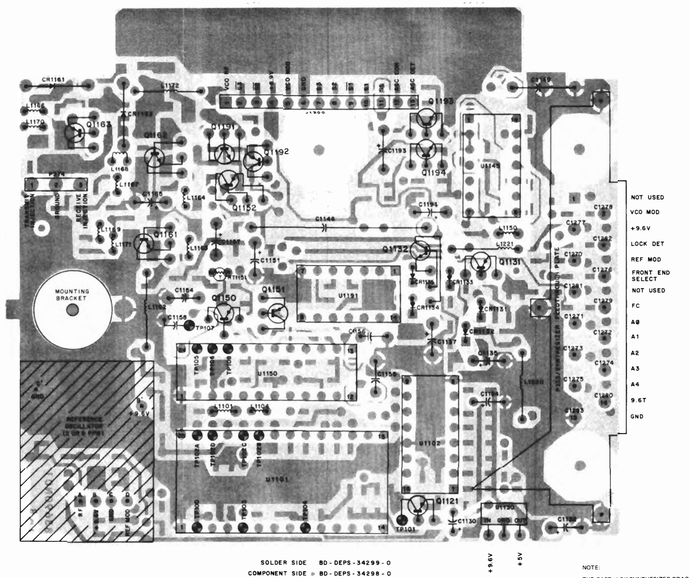
AEPS-34288-O

2 PPM CHANNEL ELEMENT BOARD



SOLDER SIDE AEPS-30208-O
COMPONENT SIDE AEPS-30207-O
OL AEPS-30206-B

TRN5377A/TRN5441A SYNTHESIZER BOARD (COMPONENT SIDE COMPONENTS)

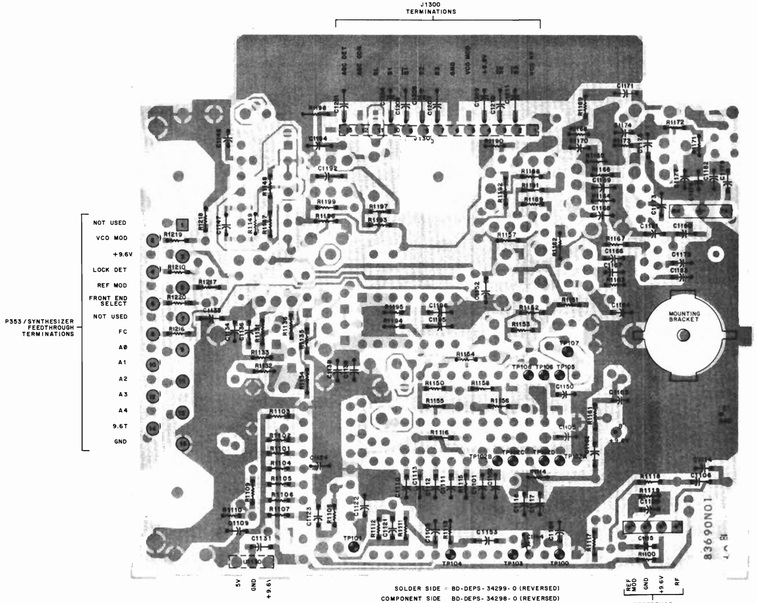


SOLDER SIDE - BD-DEPS-34299-O
COMPONENT SIDE - BD-DEPS-34298-O
OL-DEPS-34297-O

SHOWN FROM COMPONENT SIDE

NOTE:
THE *FAST—LOK* SYNTHESIZER BOARD PRINTED CIRCUIT BOARD IS A 4-LAYER BOARD. MUCH OF THE FOIL PATTERN IS ON THE INSIDE LAYERS. THESE LAYERS ARE NOT SHOWN IN THIS DIAGRAM BECAUSE THEY ARE INACCESSIBLE. REFER TO THE SCHEMATIC DIAGRAM AS NECESSARY TO DETERMINE COMPONENT INTERCONNECTIONS.

TRN5377A/TRN5441A SYNTHESIZER BOARD (SOLDER SIDE CHIP COMPONENTS)

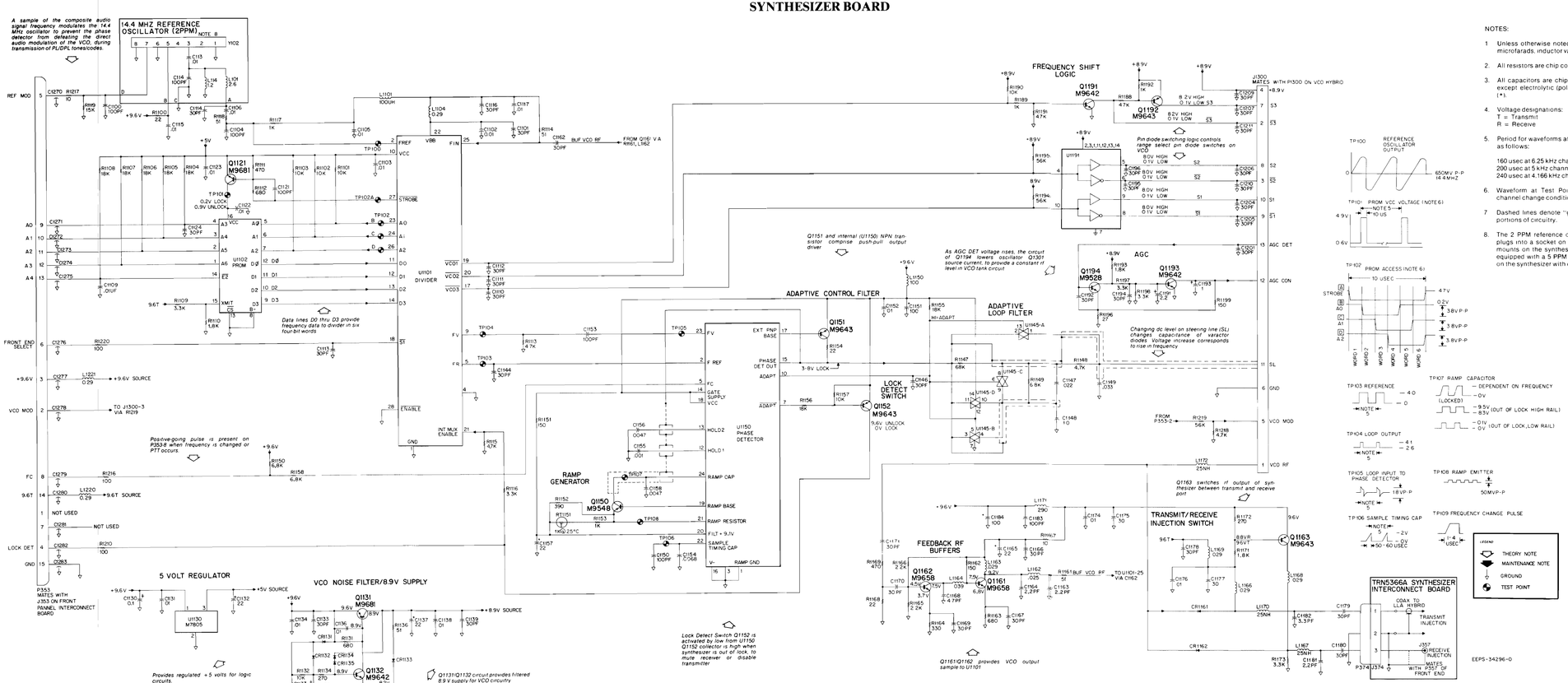


SOLDER SIDE - BD-DEPS-34299-O (REVERSED)
COMPONENT SIDE BD-DEPS-34298-O (REVERSED)
OL-DEPS-34300-O

SHOWN FROM SOLDER SIDE

NOTE
ALL COMPONENTS MOUNTED ON SOLDER SIDE ARE CHIP-TYPE

SYNTHESIZER BOARD



NOTES:

1. Unless otherwise noted, resistor values are in ohms, capacitor values are in microfarads, inductor values are in microhenries.
2. All resistors are chip components mounted to solder side of circuit board.
3. All capacitors are chip components mounted to solder side of circuit board, except electrolytic (polarized) capacitors, and those marked with an asterisk (*).
4. Voltage designations:
   T = Transmit
   R = Receive
5. Period for waveforms at test points TP101 TP103, TP104, TP105, and TP106 are as follows:
   160 usec at 6.25 kHz channel spacing
   200 usec at 5 kHz channel spacing
   240 usec at 4.166 kHz channel spacing
6. Waveform at Test Points TP101 and TP102 present during out-of-lock or channel change condition.
7. Dashed lines denote "guard band" shields, which consist of plating around portions of circuitry.
8. The 2 PPM reference oscillator consists of a channel element (Y102) which plugs into a socket on a channel element board. The channel element board mounts on the synthesizer board with connections at points A-D. For radios equipped with a 5 PPM reference oscillator, a channel element (Y101) mounts on the synthesizer with connections at points A, B(B'), C(C') and D.

EEPS-34296-O

FAST—LOK
FREQUENCY SYNTHESIZER

SYNTHESIZER BOARD
SCHEMATIC DIAGRAM

FUNCTION

Controls voltage controlled oscillator (VCO) to generate mixer injection signal in receive mode, and low level modulated rf in transmit mode.

VOLTAGE CONTROLLED OSCILLATOR

STANDARD LOCK
AND *FAST—LOK* MODELS

FUNCTION

Generates mixer injection signal in receive mode, and low level modulated rf in transmit mode. Controlled by synthesizer board.

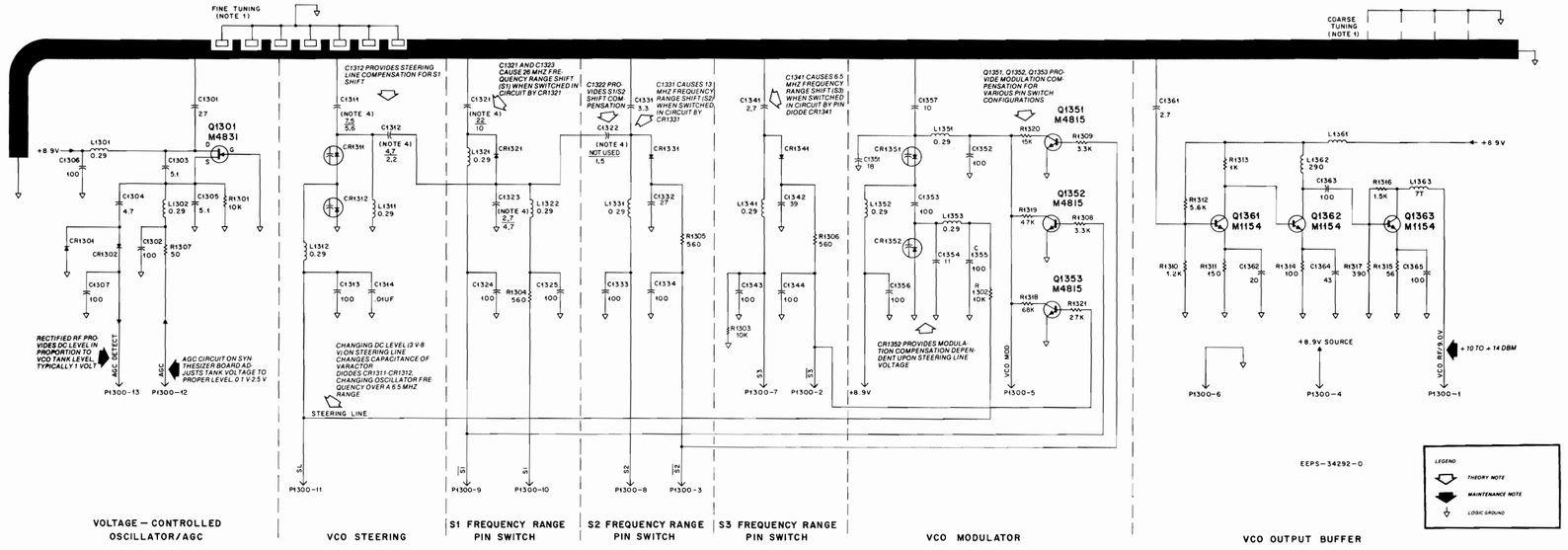
NOTE

The VCO assembly is not serviceable except for certain mechanical parts. (Refer to the *MCX100* Radio Exploded Views and Mechanical Parts List Section for mechanical parts identification and numbers.) When a malfunction is isolated to the VCO, replace the entire assembly. Order the replacement assembly by using the appropriate assembly model number listed below.

Standard Lock VCO Models
TLE2301A VCO Assembly RI (403-430 MHz)
TLE2303A VCO Assembly RIII (440-470 MHz)

Fast—Lok VCO Models
TLE2321A VCO/Assembly RI (403-430 MHz)
TLE2323A VCO/Assembly RIII (440-470 MHz)

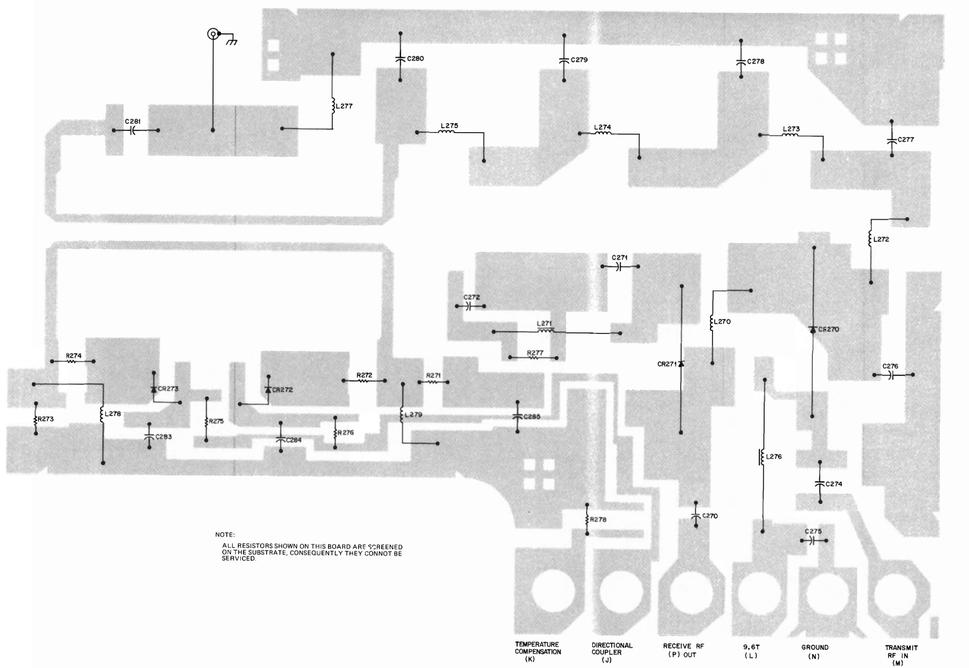
VCO SCHEMATIC



NOTES:

1. Tuning jumpers factory tuned, not field adjustable.
2. All resistors are screened parts and are therefore non-serviceable items.
3. Unless otherwise noted, resistor values are in ohms, capacitor values are in picofarads (pF) and inductor values are in microhenries (uH).
4. Range — Dependent value. Range I is 403-430 MHz. Range III is 440-470 MHz. Component values are labelled as RANGE I / RANGE III
5. All logic ground connections are made to radio logic/rf ground.
6. Pin switch line voltages:
   HI = 8.8 V
   LO = 0.1 V

HARMONIC FILTER



SHOWN FROM COMPONENT SIDE

COMPONENT SIDE = 8D-DEPS-34318-O
OL-DEPS-3439-O

parts list

TRN5439A 25/30 W PA Heatsink & Hardware — PL-8501-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
	1-80775D72	ASSEMBLY, interconnect coax; 5.0"
	1-80734D15	ASSEMBLY, output coax cable; 3.0"
	3-84208M01	SCREW, washer M3 x 0.5 x 8.0; 4 used
	3-84208M12	SCREW, Phillips M4 x 0.7 x 9.0; 3 used
	3-84208M14	SCREW, M2.5 x 0.45 x 8.0; 2 used
	15-84141M01	COVER, heatsink
	26-84142M01	HEATSINK
	29-84775M01	LUG, solder; 2 used
	64-84108M01	PLATE, carrier

TLE5483A 25/30 Watt Power Amplifier Range III (440-470 MHz) — PL-8030-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed: ± 5%; 50 V: unless otherwise stated
C1400	21-84736E18	5.6 ± 0.25 pF
C1401, 1402	21-84736E33	30
C1403, 1404	21-84736E10	25.5
C1405	21-84736E16	10 ± 0.5 pF
C1406	21-84736E29	7.5 ± 0.25 pF
C1407, 1408, 1409	21-84547A13	0.1 uF
C1410, 1411	21-84736E21	100
		diode: (see note)
CR1400	48-83654H01	silicon
		coil, rf:
L1400, 1401	24-84331M42	11 turns
L1402	24-84331M04	4 turns
		transistor: (see note)
Q1400	48-84411L98	NPN; type M11L98
		resistor, fixed:
R1400	6-124B57	3.3 ± 5%; 1/4 W
R1401	6-185B85	3.3k ± 10%; 1/8 W
		thermistor:
RT1400	6-867628	195k @ 25°C

note: For optimum performance, diodes, transistors, and integrated circuits must be ordered by Motorola part numbers.

TLE5461A Low Level Amplifier Range III (440-470 MHz) — PL-8031-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed: pF ± 5%; 50 V; unless otherwise stated
C200	21-84873H56	8.2 ± 0.5 pF
C201	21-84873H76	10
C202, 203	21-84873H59	100
C204	21-84873H84	160
C205	21-84873H59	100
C206	21-84547A23	.018 uF ± 20%
C207	21-84873H76	10
C208		NOT USED
C209, 210	21-84873H59	100
C211	21-84873H58	51
C212	21-84296M05	5 ± 0.25 pF
C213	21-84873H89	20 ± 2%
C214, 215	21-84736E12	39
C216	21-84873H59	100
C217	21-84547A23	.018 uF ± 20%
C218	21-84736E33	30
C219	21-84873H76	10
C220	21-84873H58	51
C221	21-84873H59	100
C222	21-84296M05	5 ± 0.25 pF
		diode: (see note)
CR200	48-83654H01	silicon
		coil, rf:
L200	24-83035N36	3 turns
L201	24-82723H40	290 nH
L202	24-80036A01	1 turn
L203	24-84331M22	2 turns
L212	24-83035N37	4 turns
L213	24-82723H40	290 nH
L214	24-83035N12	3 turns
L220	24-83035N38	5 turns
L221	24-82723H46	200 nH
		transistor: (see note)
Q200	48-84939C31	NPN; type M39C31
Q210	48-84411L37	NPN; type M11L37
Q220	48-869888	NPN; type M9888
		resistor, fixed:
R200 thru 213	—	non-replaceable parts

TFE6511A Harmonic Filter Range I (403-430 MHz)
TFE6513A Harmonic Filter Range III (440-470 MHz) — PL-8034-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed: pF ± 5%; 50 V: unless otherwise stated
C270	21-84873H84	160
C271	21-84736E32	27 (Range I)
	21-84736E10	25.5 (Range III)
C272	21-84873H84	160
C274	21-84736E21	100
C275	21-84873H84	160
C276	21-84736E18	5.6 ± 0.25 pF
C277, 278	21-84736E16	10 ± 0.5 pF
C279	21-84736E46	8.2 ± 0.5 pF
C280	21-84736E20	3.3 ± 0.25 pF
C281	21-84736E21	100
C283 thru 286	21-84873H84	160
		diode: (see note)
CR270, 271	48-83510F04	silicon, PIN
CR272, 273	48-84939C35	silicon, hot carrier
		coil, rf:
L270	24-83035N19	3 turns
L271	24-82723H40	0.29 uH
L272, 273	24-83035N21	3 turns
L274	24-83035N18	3 turns
L275	24-83035N19	3 turns
L276	24-82723H40	0.29 uH
L277	24-83035N29	4 turns (Range I)
	24-83035N23	4 turns (Range III)
L278, 279	24-83035N25	7 turns
		resistor, fixed:
R271 thru 278	—	non-replaceable parts

TLE5471A 6/10 Watt Amplifier Range III (440-470 MHz) — PL-8483-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed pF ± 5%; 50 V (chip): unless otherwise stated
C240	21-84736E16	10 pF ± 5 pF; 50 V (Chip)
C241	21-84736E12	39 pF ± 5% (chip)
C242, 243	21-84736E13	22
C244	21-84547A23	.01 uF ± 20%; 50 V
C245	21-84736E14	18
C246	21-84736E10	25.5
C247	21-84736E29	7.5 pF ± .25 pF; 50 V (chip)
C248	21-84736E17	6.8
C249	21-84736E13	22
C250	21-84873H59	100
C251	21-84547A23	.01 uF ± 20%; 50 V
		diode: (see note)
CR240	48-83654H01	silicon
		coil, rf:
L240	24-84331M33	7 turns
L241	24-80036A01	bead and wire
L242	24-84331M45	4 turns
L243	24-80036A01	bead and wire
L244	24-84331M33	7 turns
L245	24-84331M13	4 turns
		transistor: (see note)
Q240	48-84411L36	NPN; type M11L36
		resistor, fixed:
R250	6-11024A43	560 ± 5%, 1/8 W
		mechanical parts
	64-82287N01	PLATE, ground strap; 2 used
	42-83303N01	STRAP, ground; 2 used

note: For optimum performance, diodes, transistors, and integrated circuits must be ordered by Motorola part numbers.

TRN5370A PA Interconnect Board 25/30 W UHF
TRN5371A PA Interconnect Board 6/10 W UHF — PL-8032-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed:
C1453	21-11022G38	22 ± 5%; 50 V
C1451	21-11022G07	1.8 ± 5%; 50 V (TRN5370A)
		jumper:
JU1400, 1401	42-84510M02	strap
		coil, rf:
L1453	24-84346A02	choke, 170 nH
L1454	24-82723H46	choke, 200 nH
L1455	24-82723H46	choke, 200 nH (TRN5370A)
L1456	24-82723H46	choke, 200 nH
L1457, 1458	24-80036A01	choke, ferrite
L1459	24-80036A01	choke, ferrite (TRN5370A)
L1460	24-80036A01	choke, ferrite
		resistor, fixed: ± 5%; 1/4 W: unless otherwise stated
R1450	6-11020A81	22k
R1451	6-11020A67	5.6k
		non-referenced item
	29-84322M02	TERMINAL, post; 12 used on TRN5371A 15 used on TRN5370A

note: For optimum performance, diodes, transistors, and integrated circuits must be ordered by Motorola part numbers.

POWER AMPLIFIERS

FUNCTION

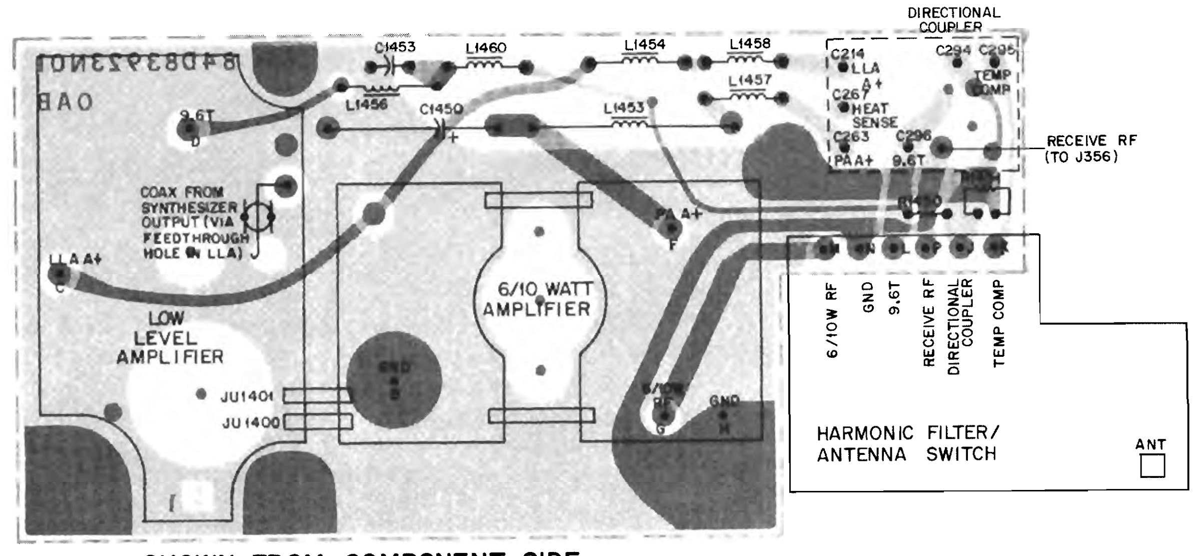
Power amplifier hybrids, except the 25/30 W PA are mounted to PA interconnect board. Low level amplifier provides amplification at synthesizer output, and power regulation as controlled by main board power circuitry. Harmonic Filter/Antenna Switch attenuates harmonics and switches antenna between transmitter and receiver.

25/30 Watt Power Amplifier Model Complement Chart

TLE2253A 25/30 W Power Amplifier Assembly RIII (440-470 MHz)
TLE5483A 25/30 W PA Hybrid RIII (440-470 MHz)
TRN5439A 25/30 W PA Heatsink & Hardware

POWER AMPLIFIERS

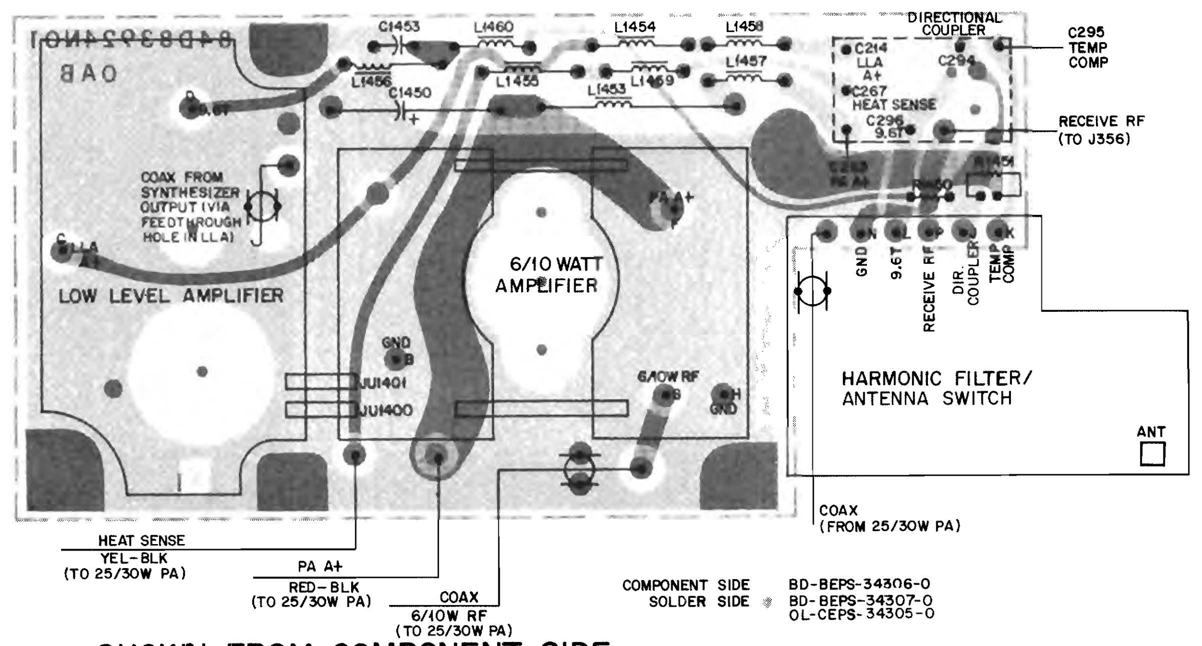
6/10 WATT PA INTERCONNECT BOARD



SHOWN FROM COMPONENT SIDE

COMPONENT SIDE BD-BEPS-34303-O
SOLDER SIDE BD-BEPS-34304-O
OL-CEPS-34302-O

25/30 WATT PA INTERCONNECT BOARD

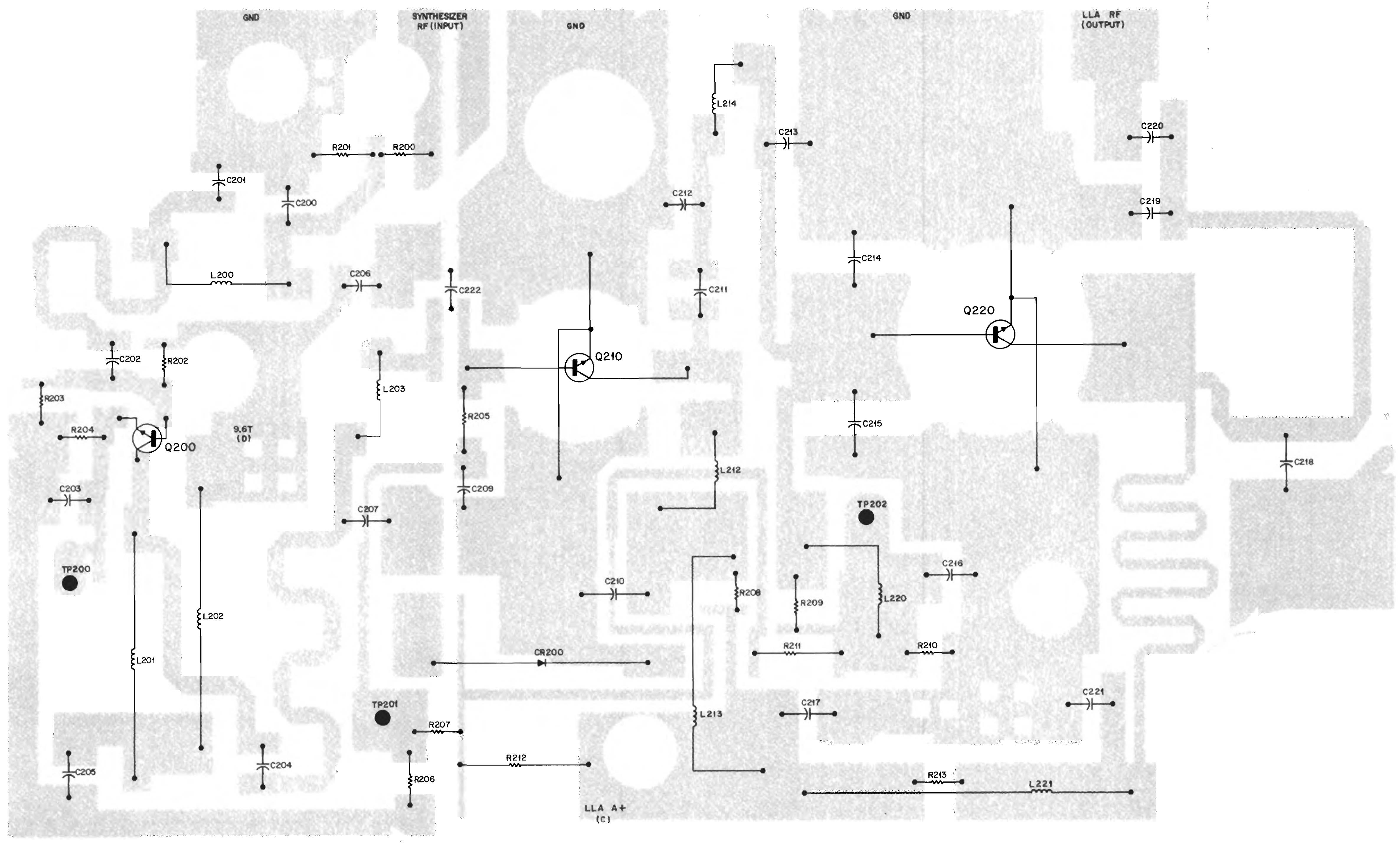


COMPONENT SIDE BD-BEPS-34306-O
SOLDER SIDE BD-BEPS-34307-O
OL-CEPS-34305-O

SHOWN FROM COMPONENT SIDE

68P81048E66-O
(Sheet 2 of 3)
5/19/83- PHI

LOW LEVEL AMPLIFIER

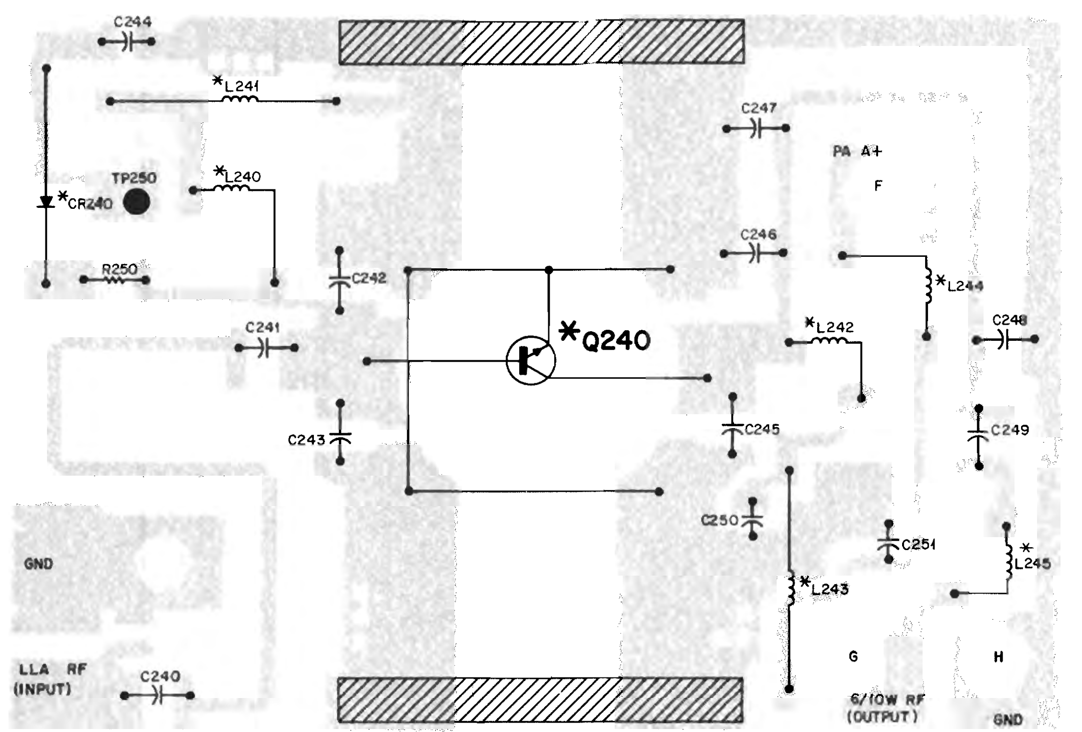


SHOWN FROM COMPONENT SIDE

NOTE:
ALL RESISTORS SHOWN ON DIAGRAM ARE SCREENED ON THE BOARD AND ARE NOT SERVICEABLE.

COMPONENT SIDE BD-DEPS-34309-O
OL-DEPS-34308-O

6/10 WATT POWER AMPLIFIER

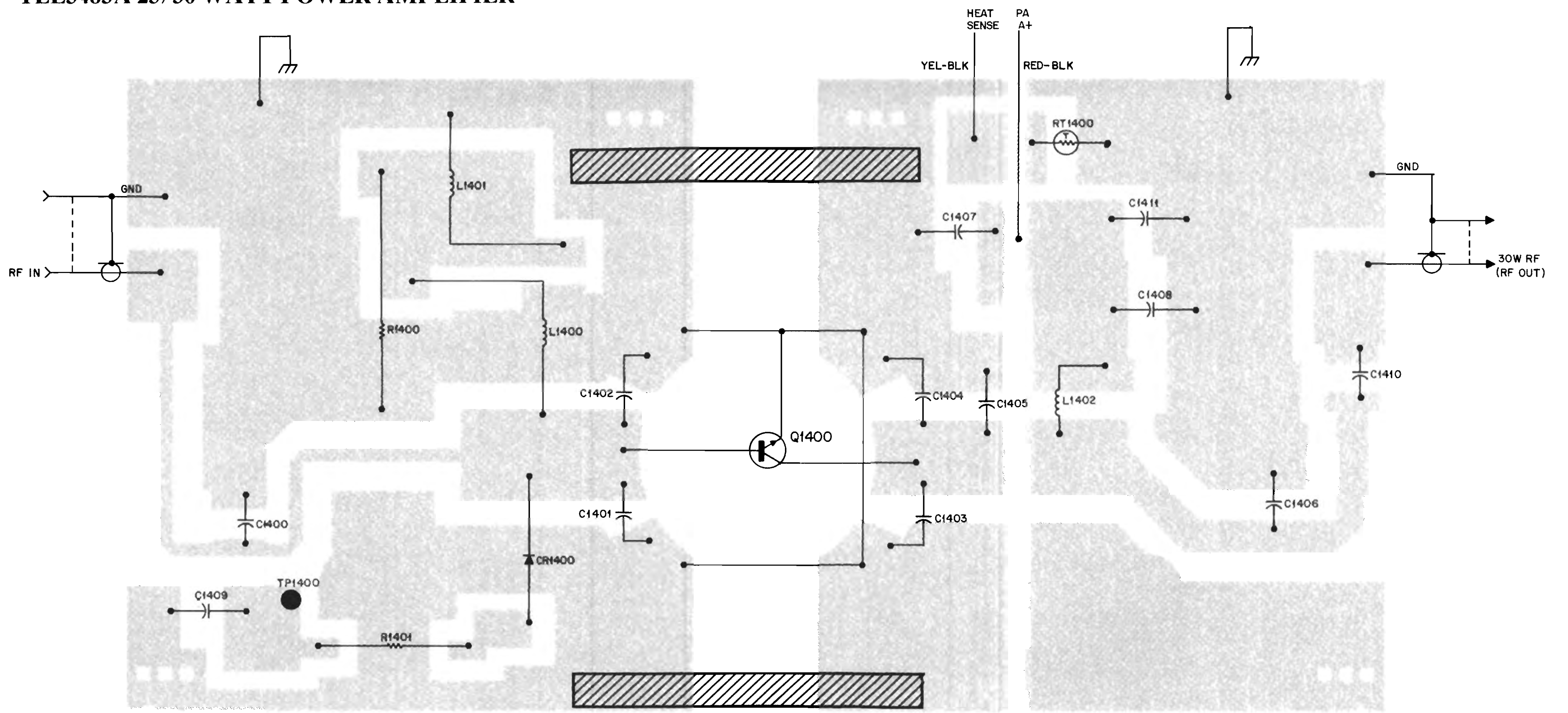


SHOWN FROM COMPONENT SIDE

NOTE: COMPONENETS DENOTED WITH * ARE NON-CHIP TYPE AND HAVE LEADS.

COMPONENT SIDE BD-CEPS-34311-O
OL-CEPS-34310-O

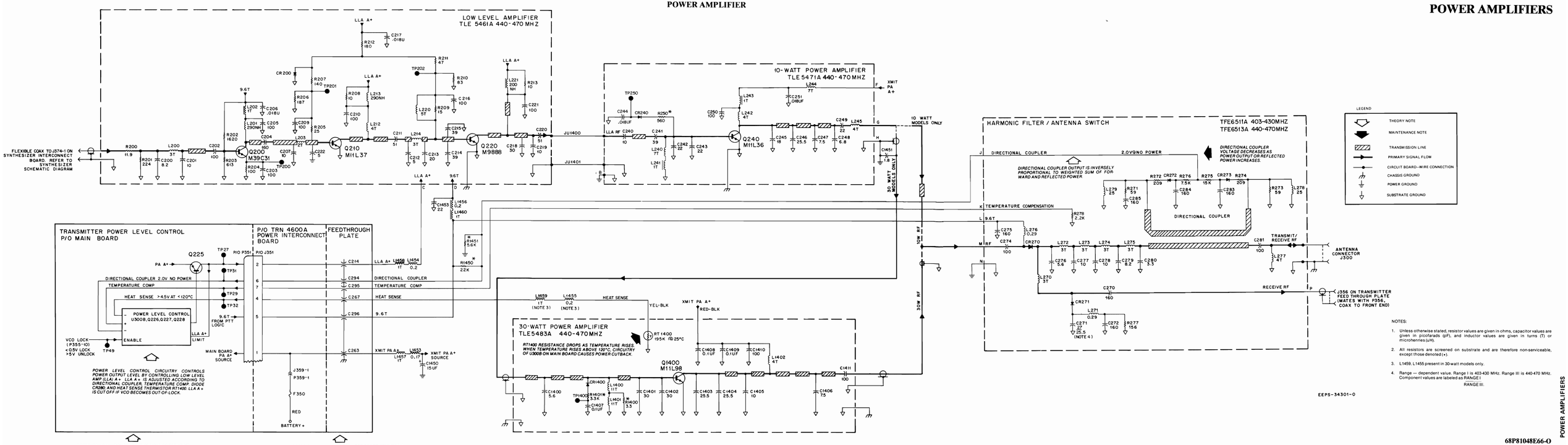
TLE5483A 25/30 WATT POWER AMPLIFIER



SHOWN FROM COMPONENT SIDE

COMPONENT SIDE BD-DEPS-34315-O
OL-DEPS-34314-O

POWER AMPLIFIERS



NOTES:

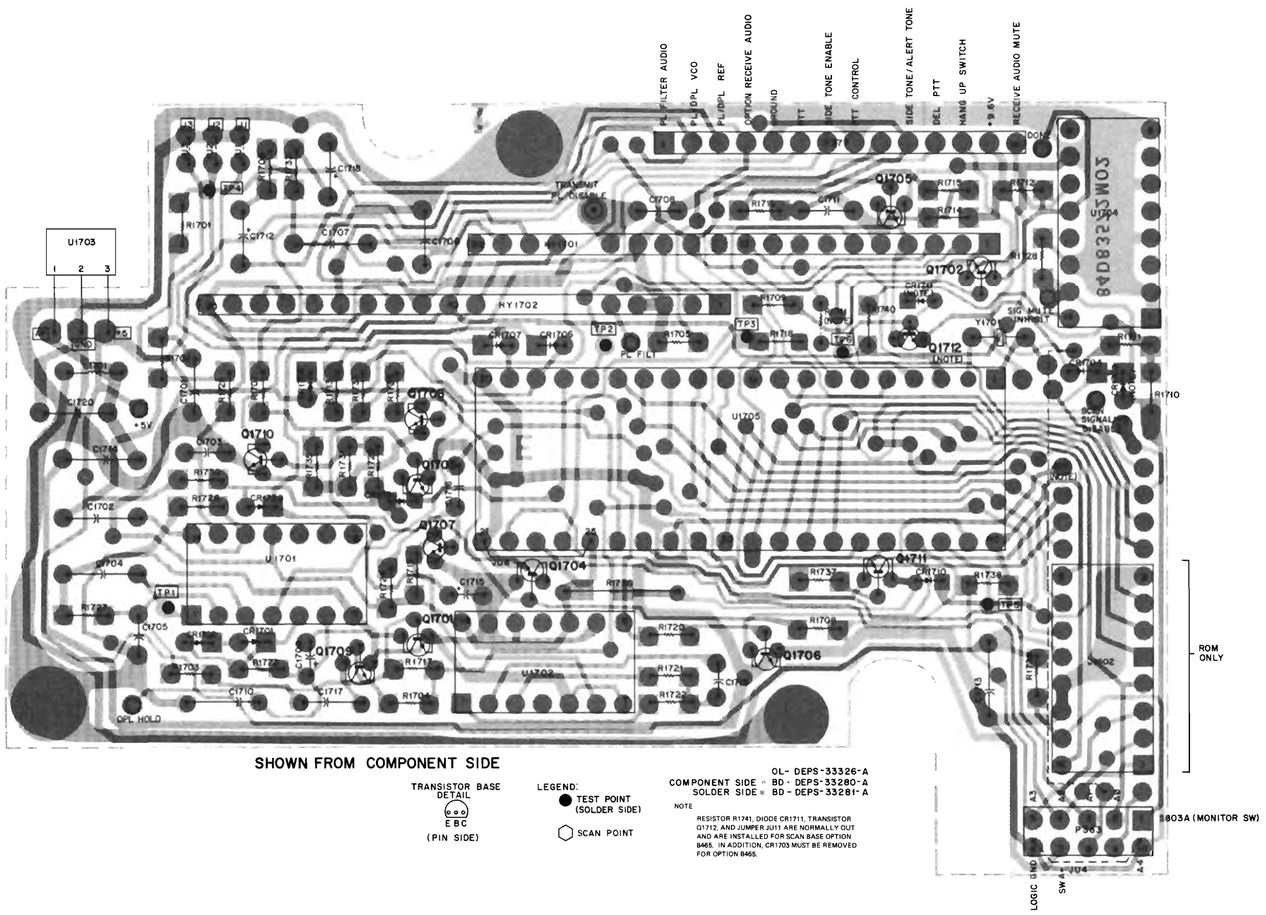
1. Unless otherwise stated, resistor values are given in ohms, capacitor values are given in picofarads (pF), and inductor values are given in turns (T) or microhenries (uH).
2. All resistors are screened on substrate and are therefore non-serviceable, except those denoted (*).
3. L1459, L1455 present in 30-watt models only.
4. Range — dependent value. Range I is 403-430 MHz. Range III is 440-470 MHz. Component values are labeled as RANGE I RANGE III.

EEPS-34301-O

TONE *PRIVATE-LINE* AND *DIGITAL PRIVATE-LINE* ENCODER/DECODER

MODEL TLN2348C

PL/DPL CIRCUIT BOARD



68P81048E52-B
(Sheet 1 of 2)
5/19/83-PHI

parts list

TRN4667B PL/DPL Board, EMA Models — PL-7696-A

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed: uF ± 5%; 50 V: unless otherwise stated
C1701	8-11023A20	.039
C1702	8-11023A25	0.1
C1703	8-11023A35	.003
C1704	8-11023A25	0.1
C1705	8-11023A02	.0012
C1706	8-11023A20	.039
C1707	8-11023A25	0.1
C1708	8-11023A10	.0056
C1709	23-84538G01	1 ± 20%
C1710	8-11023A22	.056
C1711	8-11023A20	.039
C1712	23-84665F25 or 23-11019A38	47 ± 20%; 10 V 47 ± 20%; 10 V
C1713, 1714	8-11023A25	0.1
C1715	23-84538G01	1 ± 20%
C1716	8-11023A04	.0018
C1717	8-11023A06	.0027
C1718	23-84665F25 or 23-11019A38	47 ± 20%; 10 V 47 ± 20%; 10 V
C1719	8-11023A01	.001
C1720	21-82428B07	.01 ± 20%; 100 V
		diode: (see note)
CR1701 - 1710	48-84399M01	silicon
CR1711	48-84399M01	silicon (Channel Scan base models only)
		connector, receptacle:
J352	9-84319M01	female: 14-contact
J377	9-84319M03	female: 22-contact
J1502	9-80269B01	SOCKET, 16-contact
		coil, rf:
L1701	24-83451F02	choke: 47 uH
		connector, plug:
P363	28-84528K14	male: 10-contact
P377	28-84318M02	male: 14-contact
		transistor: (see note)
Q1701 - 1711	48-02081B10	NPN; type M1B10
Q1712	48-02081B10	NPN; type M1B10 (Channel Scan base models only)
		resistor, fixed: ± 5%; 1/4 W: unless otherwise stated
R1701	6-10621D70	64.9k ± 1%
R1702	6-10621D62	53.6k ± 1%
R1703	6-11020B16	560k
R1704, 1705	6-11020A89	47k (note 3)
R1706	6-11020A75	12k
R1707	6-11020A97	100k
R1708	6-11020A73	10k
R1709	6-11020A89	47k
R1710, 1711	6-11020A73	10k
R1712	6-11020A81	22k
R1713	6-11020A85	33k
R1714	6-11020A57	2.2k
R1715, 1716	6-11020A79	18k
R1717	6-11020A89	47k
R1718	6-11020A73	10k
R1719	6-11020A57	2.2k
R1720	6-11020A89	47k
R1721	6-11020A99	120k
R1722	6-11020A91	56k
R1723	6-11020A97	100k
R1724	6-11020A91	56k
R1725	6-10621D70	64.9k ± 1%
R1726	6-10621D82	86.6k ± 1%
R1727	6-10621D62	53.6k ± 1%
R1728	6-11020A97	100k
R1729	6-11020A87	39k
R1730	6-11020A75	12k
R1731	6-11020A81	22k
R1732	6-11020A79	18k
R1733	6-11020A89	47k
R1734	6-11020A93	68k
R1735	6-11020A97	100k
R1736	6-11009C73	10k
R1737	6-11020A89	47k
R1738, 1739	6-11020A73	10k
R1740	6-11020A49	1k
R1741	6-11020A65	4.7k (Channel Scan base models only)
		integrated circuit: (see note)
U1701	51-83629M06	type M2906
U1702	51-82884L57	type 84L57
U1703	51-83629M17	type 29M17
U1704	51-83627M62	type 27M62
U1705	51-83625M72	type 25M72

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		crystal:
Y1701	48-82611M06	4 MHz
		mechanical parts
	9-80269B04	SOCKET, 40-contact (U1705)
	14-05160A01	INSULATOR, crystal
	42-35424B01	TY-WRAP; 2 used
	TRN4666A	ROM, personality
	1-80732D01	ASSEMBLY cable and connector, includes: ref. J352 and J377
	39-10184A10	TERMINAL, pin

notes:

1. For optimum performance, diodes, transistors, and integrated circuits must be ordered by Motorola part numbers.
2. For parts not listed in the above parts list refer to the radio set mechanical parts list section.
3. Value of R1705 may be varied at time of production. Replace with value originally supplied.

TONE *PRIVATE-LINE* AND *DIGITAL PRIVATE-LINE* ENCODER/DECODER

MODEL TLN2348C

PL/DPL ENCODER/DECODER

FUNCTION

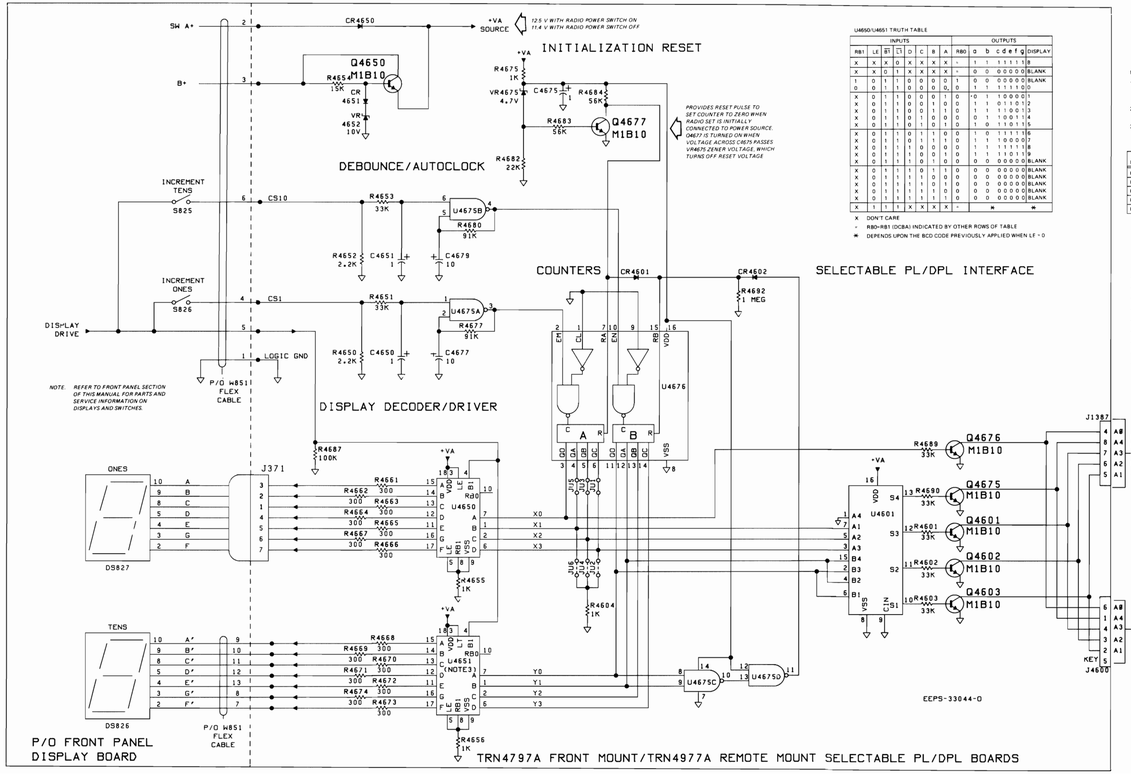
Encodes and decodes tone *Private-Line* and *Digital Private-Line* coded squelch signals to enable and be enabled by compatibly equipped radios. Also provides time-out timer function to de-key transmitter after a predetermined amount of time. Time-out timer may be reset by momentarily releasing microphone push-to-talk button.

Model Complement Chart

TLN2348C CEPT/Multi-Code PL/DPL Assembly
TFN6045A PL Filter, CEPT
TRN4372A D-A Hybrid
TRN4667C Multi-PL/DPL Board

PL/DPL ENCODER-DECODER

SELECTABLE PL/DPL ENCODER



U4650/U4651 TRUTH TABLE

INPUTS									OUTPUTS								
RBI	LE	$\overline{BI}$	$\overline{LT}$	D	C	B	A		RBO	a	b	c	d	e	f	g	DISPLAY
X	X	X	0	X	X	X	X		-	1	1	1	1	1	1	1	8
X	X	0	1	X	X	X	X		-	0	0	0	0	0	0	0	BLANK
1	0	1	1	0	0	0	0		1	0	0	0	0	0	0	0	BLANK
0	0	1	1	0	0	0	0		0	1	1	1	1	1	1	0	0
X	0	1	1	0	0	0	1		0	*0	1	1	0	0	0	0	1
X	0	1	1	0	0	1	0		0	1	1	0	1	1	0	1	2
X	0	1	1	0	0	1	1		0	1	1	1	1	0	0	1	3
X	0	1	1	0	1	0	0		0	0	1	1	0	0	1	1	4
X	0	1	1	0	1	0	1		0	1	0	1	1	0	1	1	5
X	0	1	1	0	1	1	0		0	1	0	1	1	1	1	1	6
X	0	1	1	0	1	1	1		0	1	1	1	0	0	0	0	7
X	0	1	1	1	0	0	0		0	1	1	1	1	1	1	1	8
X	0	1	1	1	0	0	1		0	1	1	1	1	0	1	1	9
X	0	1	1	1	0	1	0		0	0	0	0	0	0	0	0	BLANK
X	0	1	1	1	0	1	1		0	0	0	0	0	0	0	0	BLANK
X	0	1	1	1	1	0	0		0	0	0	0	0	0	0	0	BLANK
X	0	1	1	1	1	0	1		0	0	0	0	0	0	0	0	BLANK
X	0	1	1	1	1	1	0		0	0	0	0	0	0	0	0	BLANK
X	0	1	1	1	1	1	1		0	0	0	0	0	0	0	0	BLANK
X	1	1	1	X	X	X	X		-	**							**

X DON'T CARE
- RBO=RBI (OCBA) INDICATED BY OTHER ROWS OF TABLE
** DEPENDS UPON THE BCD CODE PREVIOUSLY APPLIED WHEN LE = 0

NOTES
1. UNLESS OTHERWISE STATED, RESISTOR VALUES ARE GIVEN IN OHMS, CAPACITOR VALUES ARE GIVEN IN MICROFARADS (UF).
2. J4600 IS USED IN FRONT MOUNT (TRN4797A) MODELS. J1387 IS USED IN REMOTE MOUNT (TRN4977A) MODELS.
3. U4651 IS CONTAINED IN TRN4688A DISPLAY BUFFER SECOND DIGIT KIT

INTEGRATED CIRCUIT CHART

REF	V_{DD} P/N	V_{SS} P/N	DESCRIPTION	TYPE
U4650	18	9	DISPLAY DECODER/DRIVER	84L76
U4651	18	9	DISPLAY DECODER/DRIVER	84L76
U4675	14	7	QUAD NAND	84L66
U4676	16	8	DUAL 4-BIT UP COUNTER	84L72
U4601	16	8	4-BIT FULL ADDER	84L23

U4676 TRUTH TABLE

CLOCK	ENABLE	RESET	ACTION
⌐	↑	0	INCREMENT COUNTER
0	⌐	0	INCREMENT COUNTER
¬	X	0	NO CHANGE
X	⌐	0	NO CHANGE
↑	0	0	NO CHANGE
1	¬	0	NO CHANGE
X	X	1	Q0 THRU Q3 = 0

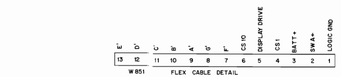
X = DON'T CARE

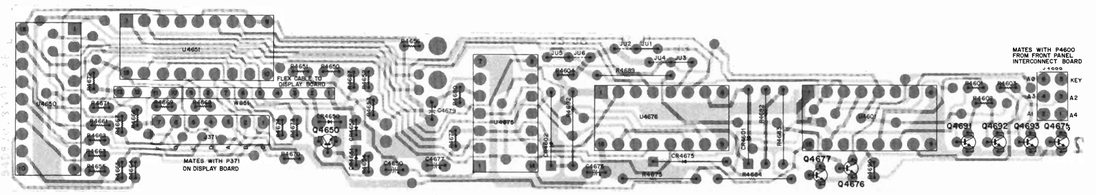
U4601 TRUTH TABLE (ONE STAGE)

C_{IN}	B	A	C_{OUT}	S
0	0	0	0	0
0	0	1	0	1
0	1	0	0	1
0	1	1	1	0
1	0	0	0	1
1	0	1	1	0
1	1	0	1	0
1	1	1	1	1

68P81048E26-A
(Sheet 1 of 2)
1/19/83- PHI

FRONT MOUNT SELECTABLE PL/DPL BOARD

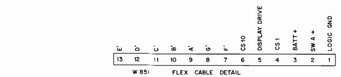


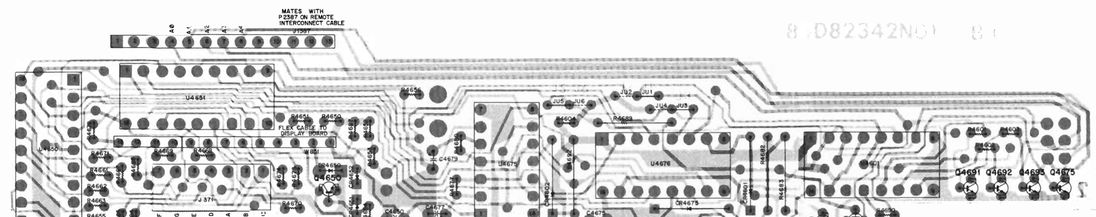


SHOWN FROM SOLDER SIDE

COMPONENT SIDE = OL-EEPS-33045-O
SOLDER SIDE = BO-EEPS-33046-O
BO-EEPS-33047-O

REMOTE MOUNT SELECTABLE PL/DPL BOARD





SHOWN FROM SOLDER SIDE

COMPONENT SIDE = OL-EEPS-33073-A
SOLDER SIDE = BO-EEPS-33074-A
BO-EEPS-33075-A

SELECTABLE PL/DPL ENCODER/DECODER

MODELS TRN4797A AND TRN4977A

parts list

TRN4797A Selectable PL/DPL Board (Front Mount)
TRN4977A Selectable PL/DPL Board (Remote Mount) PL-7643-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed: uF ± 20%; 25 V
C4650, 4651	23-11037H09	1.0
C4675	23-11037A09	1.0
C4677	23-11037A20	1.0
C4679	23-11037A20	1.0
		diode: (see note)
CR4601, 4602	48-83654H01	silicon
CR4650	48-82466H13	silicon
CR4651	48-84399M01	silicon
		connector, receptacle:
J371	9-82846L04	female, 7-contact
J1387	9-84319M02	female, 10-contact (TRN4977A only)
P4600	—	(TRN4797A only) consists of:
	9-84279D02	TERMINAL, female; 5 used
	14-84277D21	HOUSING, receptacle: 3-position
	22-84835F01	PLUG, polarizing key
		connector, plug:
J4600	28-84528K16	male, 6-contact (TRN4797A only)
		transistor: (see note)
Q4601, 4602, 4603	42-2081B10	NPN; type M1B10
Q4650	48-2081B10	NPN; type M1B10
Q4675, 4676, 4677	48-2081B10	NPN; type M1B10
		resistor, fixed: ± 5%; 1/4 W
R4601, 4602, 4603	6-11020A85	33k
R4604	6-11020A49	1k
R4650	6-11020A57	2.2k
R4651	6-11020A85	33k
R4652	6-11020A57	2.2k
R4653	6-11020A85	33k
R4653	26-11020A77	15k
R4655, 4656	6-11020A49	1k
R4687	6-11020A97	100k
R4661 thru 4674	6-11020A36	300
R4675	6-11009C49	1k
R4677, 4680	6-11020A96	91k
R4682	6-11009C81	22k
R4683, 4684	6-11009C91	56k
R4689	6-11009C85	33k
R4690	6-11020A85	33k
R4692	6-11009D22	1.0 meg
		integrated circuit: (see note)
U4601	51-82884L23	4-bit full added
U4650	51-82884L76	decoder/driver; type 84L23
U4675	51-82884L66	quad NAND; type 84L66
U4676	51-82884L12	dual 4-bit up-counter; type 84L12
		cable, flat:
W851	30-82906L08	13-conductor
		voltage regulator: (see note)
VR4652	48-82256C11	Zener; 10 V
VR4675	48-82256C03	Zener; 4.7 V
		mechanical parts
	42-84064M01	CLIP, board retainer (TRN4797A)
	46-82377N01	GUIDE, circuit board; 2 used (TRN4977A)
	42-10217A02	STRAP, cable harness (TRN4797A)

notes:
1. For optimum performance, diodes, transistors, and integrated circuits must be ordered by Motorola part numbers.
2. For component not listed in the above parts list, refer to the exploded view/mechanical parts list section.

TRN4689A Second Digit Display Buffer PL-7644-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		integrated circuit: (see note)
U4651	51-82884L76	decoder/driver: type 84L76

note: For optimum performance, diodes, transistors, and integrated circuits must be ordered by Motorola part numbers.

FUNCTION

Allows operator to select PL/DPL squelch codes encoded and decoded by the PL/DPL encoder/decoder. Replaces the channel selector switch input to the PL/DPL board with input corresponding to operator-selected code displayed on front panel.

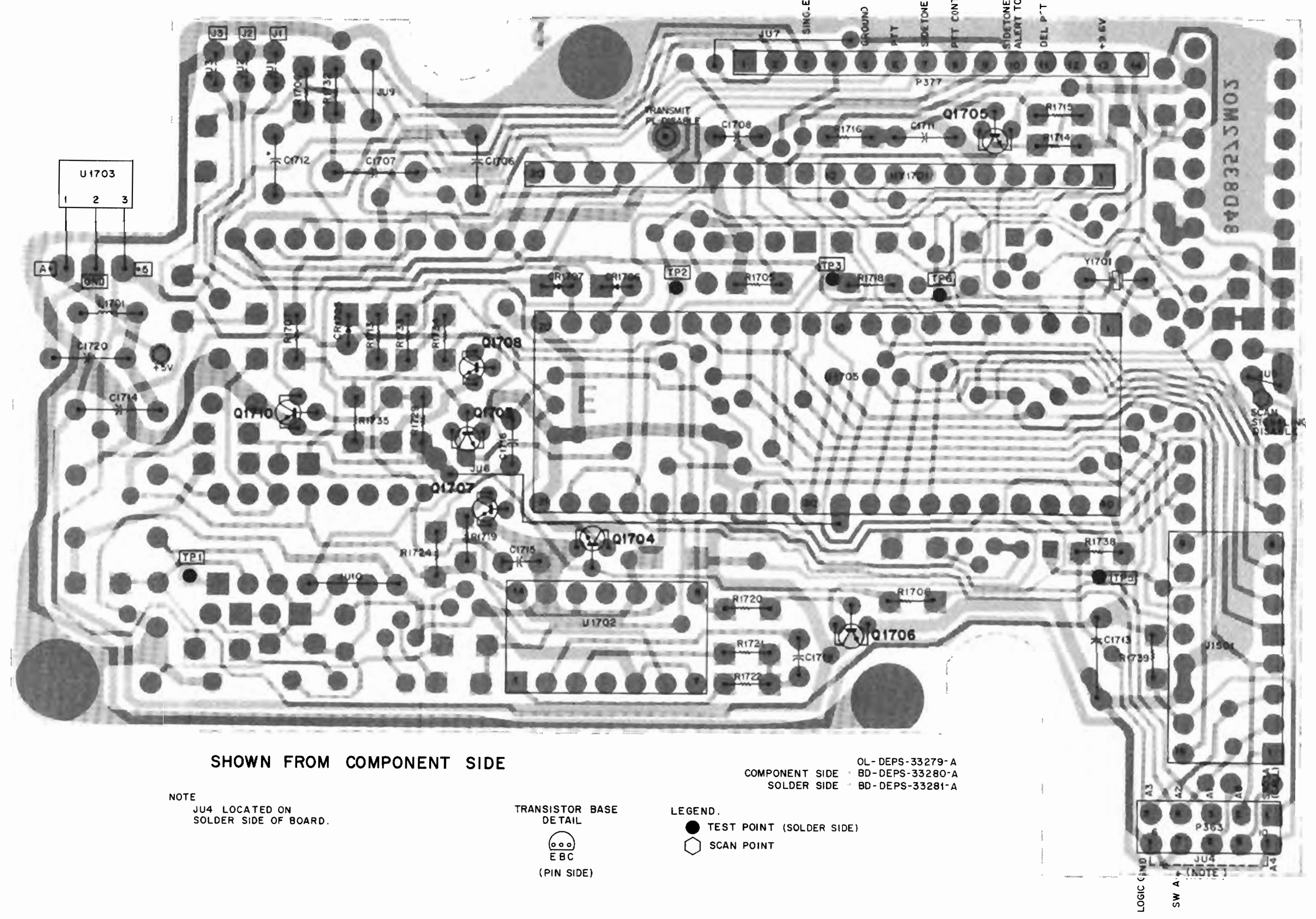
parts list

TRN5042B Single Tone Board PL-7703-A

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed: uF ± 5%; 50 V: unless otherwise stated
C1706	8-11023A08	.0039
C1707	8-11023A13	.01
C1708	21-82428B45	820 pF
C1711	8-11023A20	.039
C1712	23-84665F25	47 ± 20%; 10 V
	or 23-11019A38	47 ± 20%; 10 V
C1713, 1714	8-11023A25	0.1
C1715	23-84538G01	1 ± 20%
C1716	8-11023A04	.0018
C1719	8-11023A01	.001
C1720	21-82428B07	.01 ± 20%; 100 V
		diode: (see note)
CR1705 - 1707	48-84399M01	silicon
		connector, receptacle:
J352	9-84319M01	female: 14-contact
J377	9-84319M03	female: 22-contact
J1501	9-80269B01	SOCKET, 16-contact
		coil, rf:
L1701	24-83451F02	choke: 47 uH
		connector, plug:
P363	28-84528K14	male: 10-contact
P377	28-84318M02	male: 14-contact
		transistor: (see note)
Q1703 - 1708, 1710	48-02081B10	NPN; type M1B10
		resistor, fixed: ± 5%; 1/4 W: unless otherwise stated
R1705	6-11020A89	47k (note 3)
R1706	6-11020A75	12k
R1707	6-11020A97	100k
R1708	6-11020A73	10k
R1713	6-11020A85	33k
R1714	6-11020A57	2.2k
R1715, 1716	6-11020A79	18k
R1718	6-11020A73	10k
R1719	6-11020A57	2.2k
R1720	6-11020A89	47k
R1721	6-11020A99	120k
R1722	6-11020A91	56k
R1724	6-11020A91	56k
R1725	6-10621D70	64.9k ± 1%
R1726	6-10621D82	86.6k ± 1%
R1727	6-10621D62	53.6k ± 1%
R1728	6-11020A97	100k
R1729	6-11020A87	39k
R1730	6-11020A75	12k
R1731	6-11020A81	22k
R1732	6-11020A79	18k
R1733	6-11020A89	47k
R1734	6-11020A93	68k
R1735	6-11020A97	100k
R1738, 1739	6-11020A73	10k
		integrated circuit: (see note)
U1702	51-82884L57	type 84L57
U1703	51-83629M17	type 29M17
U1705	51-83625M39	type 25M39
		crystal:
Y1701	48-82611M06	4 MHz
		mechanical parts
	9-80269B04	SOCKET, 40-contact (U1705)
	14-05160A01	INSULATOR, crystal
	42-35424B01	TY-WRAP; 2 used
	TRN4666A	ROM, personality
	1-80753D54	ASSEMBLY cable and connector, includes: ref. J352 and J377
	39-10184A10	TERMINAL, pin

notes:

1. For optimum performance, diodes, transistors, and integrated circuits must be ordered by Motorola part numbers.
2. For parts not listed in the above parts list refer to the radio set mechanical parts list section.
3. Value of R1705 may be varied at time of production. Replace with value originally supplied.



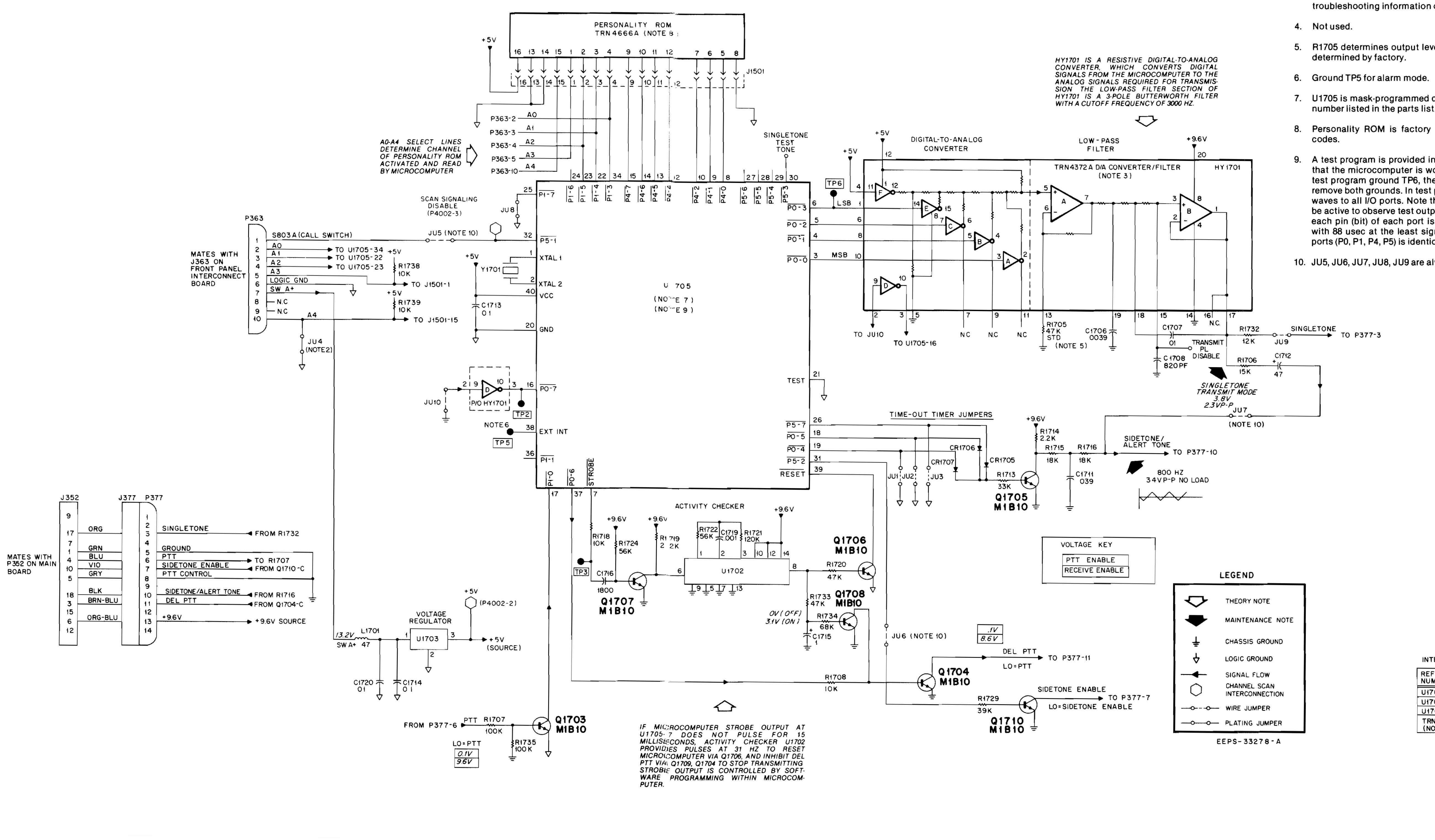
SHOWN FROM COMPONENT SIDE

OL-DEPS-33279-A
COMPONENT SIDE BD-DEPS-33280-A
SOLDER SIDE BD-DEPS-33281-A

NOTE
JU4 LOCATED ON SOLDER SIDE OF BOARD.

TRANSISTOR BASE DETAIL
E B C
(PIN SIDE)

LEGEND.
● TEST POINT (SOLDER SIDE)
⬡ SCAN POINT



SINGLE TONE ENCODER

MODEL TLN2394A

NOTES:

1. Unless otherwise noted, resistor values are in ohms, capacitor values are in microfarads (uF) and inductor values are in microhenries (uH).
2. JU4 out for greater than 16-channel operation or selectable single tone.
3. HY1701 is a non-serviceable part. Schematic representation is shown for troubleshooting information only.
4. Not used.
5. R1705 determines output level of filter if required. If R1705 is present, value is determined by factory.
6. Ground TP5 for alarm mode.
7. U1705 is mask-programmed during manufacture. It must be ordered by the part number listed in the parts list.
8. Personality ROM is factory programmed. Order by kit number and required codes.
9. A test program is provided in the microcomputer, which may be used to verify that the microcomputer is working, or to check other circuitry. To activate the test program ground TP6, then ground TP5 in sequence. To stop test program, remove both grounds. In test program mode, the microcomputer applies square waves to all I/O ports. Note that the A0-A4 address lines and the PTT line must be active to observe test output at those lines. The period of the square wave at each pin (bit) of each port is 2 times the period of the preceding bit, starting with 88 usec at the least significant bit (such as P0-0). The test pattern at all ports (P0, P1, P4, P5) is identical and synchronized.
10. JU5, JU6, JU7, JU8, JU9 are always in.

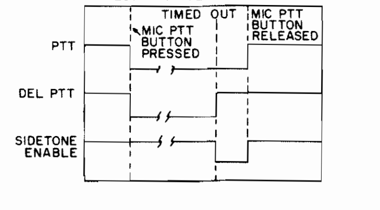
FUNCTION

Encodes single tone when operator presses front panel tone call button. Tone frequency and duration is determined by Personality ROM.

Model Complement Chart

TLN2394A Single Tone Encoder
TRN5042B Single Tone Board
TRN4372A D-A Hybrid

TIMEOUT TIMER/PTT TIMING
LOW = ACTIVE STATE



TIME-OUT TIMER JUMPER CHART

TIME	JU1	JU2	JU3
15 SEC	IN	OUT	OUT
30 SEC	OUT	OUT	OUT
60 SEC	OUT	IN	OUT
90 SEC	IN	IN	OUT
2-1/2 MIN	OUT	OUT	IN
5 MIN.	IN	OUT	IN
∞	OUT	IN	IN

INTEGRATED CIRCUIT CHART

REFERENCE NUMBER	TYPE NUMBER	VCC PIN	V- PIN	DESCRIPTION
U1702	MC14541	14	7	TIMER
U1703	MC7805C	1	2	+ 5V REGULATOR
U1705	MC3870	40	20	MICROCOMPUTER
TRN4666A (NOTE 8)	74S287	16	8	BIPOLAR THREE STATE PROM

68P81048E49-A
1/19/83- PHI

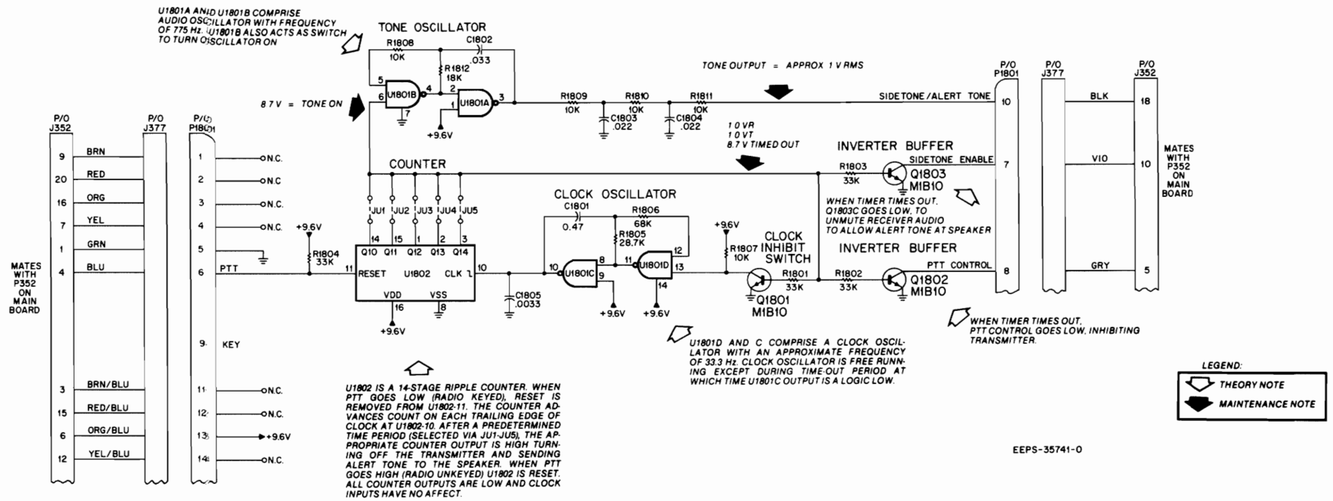
TIME-OUT TIMER
MODEL TRN5666A

parts list

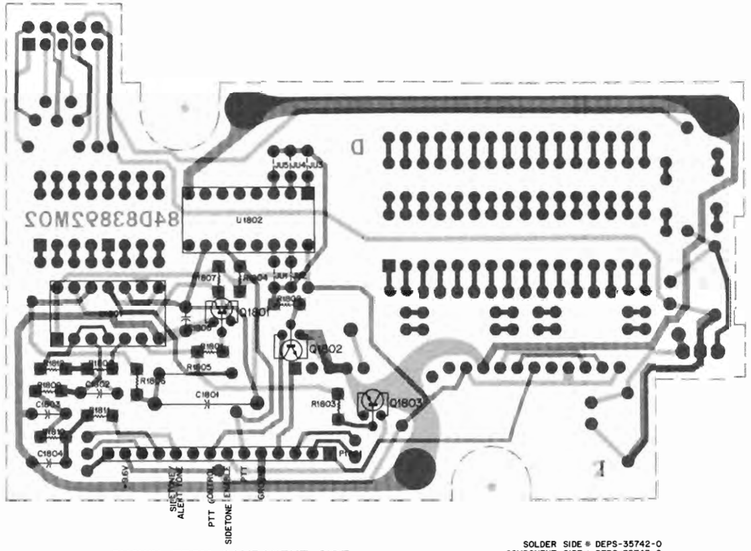
TRN5666A Time-Out Timer — PL-8324-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed: uF ± 10%; 50 V; unless otherwise stated
C1801	8-84637L42	.47; 100 V
C1802	8-11023B19	.033
C1803, 1804	8-11023B17	.022
C1805	8-11023B07	.0033
		connector, receptacle:
P1801	28-84318M02	male; 14-contact
J352	9-84319M03	female; 22-contact
J377	9-84319M01	female; 14-contact
		transistor: (see note)
Q1801, 1802, 1803	48-02081B10	NPN; type M1B10
		resistor, fixed ± 5%; 1/4 W; unless otherwise stated
R1801, 1802, 1803, 1804	6-11020A85	33k
R1805	6-10621D36	28.7k; 1%, 1/8 W
R1806	6-11020A93	68k
R1807, 1808, 1809, 1810, 1811	6-11020A73	10k
R1812	6-11020A79	18k
		integrated circuit: (see note)
U1801	51-82884L05	Quad NAND gate
U1802	51-82884L42	14-bit Binary Counter

TIME-OUT TIMER



TIME-OUT TIMER



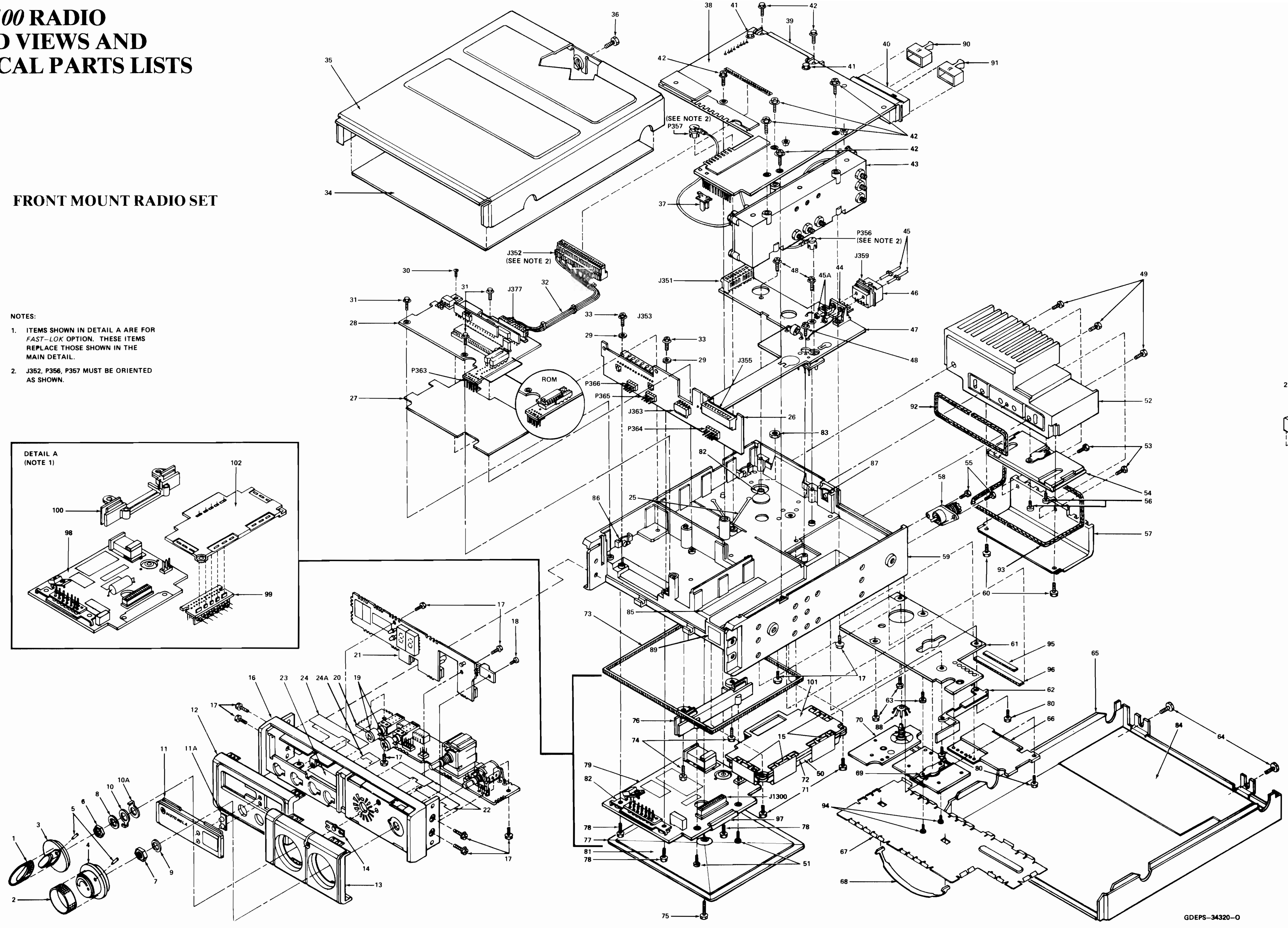
FUNCTION

Dekeys transmitter after a predetermined period of time, such as 60 seconds. May be reset by momentarily releasing microphone push-to-talk button. Available on carrier squelch models only.

68P81063E76-O
1/19/83- PHI

UHF *MCX100* RADIO EXPLODED VIEWS AND MECHANICAL PARTS LISTS

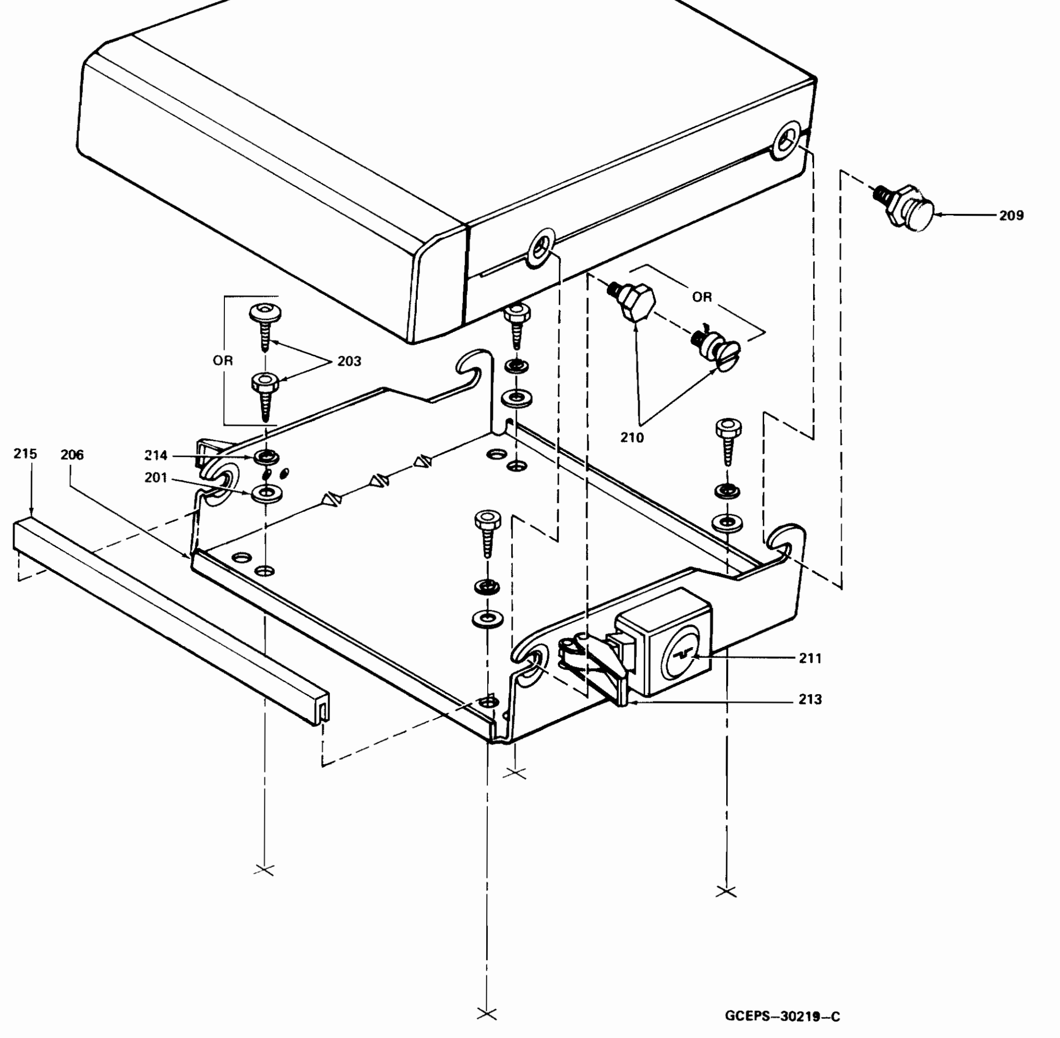
FRONT MOUNT RADIO SET



NOTES:

1. ITEMS SHOWN IN DETAIL A ARE FOR *FAST–LOK* OPTION. THESE ITEMS REPLACE THOSE SHOWN IN THE MAIN DETAIL.
2. J352, P356, P357 MUST BE ORIENTED AS SHOWN.

MOUNTING HARDWARE



parts list

Radio Set Mechanical Parts — PL-8109-O

ITEM	MOTOROLA PART NO.	DESCRIPTION
1	37-84215M01	BAND KNOB (channel select)
2	37-84215M02	BAND KNOB (volume control)
3	36-84149M01	KNOB (channel select)
4	36-84148M01	KNOB (volume on/off)
5	3-84220M01	SCREW, set, M3 x 0.5 x 5; 2 used
6	2-84218M02	NUT M9 x 0.75
7	2-84218M01	NUT, M7 x 0.75
8	4-84219M02	LOCK WASHER #9 internal
9	4-84219M01	LOCK WASHER, #7 internal
10	46-84150M02	STOP KNOB
10A	46-84150M01	STOP KNOB
11	61-84153M01	LENS (TRN4638A)
	or 61-84153M02	LENS (TRN4639A)
	or 61-84153M11	LENS (TRN4644A)
	or 61-84153M12	LENS (TRN4645A)
11A	61-82106N01	LENS, display LED
12	64-84145M01	PANEL, button (TRN4623A)
	or 64-84145M02	PANEL, button (TRN4624A)
13	64-84146M01	PANEL, volume/switch/channel (TRN4622A)
14	61-84152M02	LENS, photocell
15	42-82015P01	CLIPS, VCO
16	64-84046M01	PANEL, frame front (TRN4620A)
17	3-84208M01	SCREW, taptite; M3 x 0.5 x 8
18	3-84208M03	SCREW, taptite; M2.2 x 0.45 x 6
19	38-84139M01	BUTTON, push (squelch) TRN4608A
	and	TRN4609A, TRN4607A
	38-84139M03	BUTTON, push (monitor) TRN4660A
20	—	BOARD, switch
21	—	BOARD, display
22	14-84183M01	INSULATOR, front panel
23	14-84183M02	INSULATOR, front panel
24	14-84183M03	INSULATOR, front panel
24A	14-84183M05	INSULATOR, front panel center
25	30-83361G01	CABLE, coaxial (TRN5366A)
26	—	BOARD, front panel interconnect
27	14-84184M01	INSULATOR, option area
28	—	BOARD, PL/DPL
29	4-82318N01	WASHER, flat synthesizer connector
30	3-84208M03	SCREW, M2.2 x 0.45 x 6.0
31	3-84208M01	SCREW, washer; M3 x 0.5 x 8.0
32	—	CABLE, assembly (refer to associated circuit board parts list)
33	3-84208M01	SCREW, washer; M3 x 0.5 x 8.0
34	14-84173M01	INSULATOR, top cover
35	15-84175M01	COVER, top
36	3-84208M12	SCREW, Phillips M4 x 0.7 x 9.0
37	46-84135M01	GUIDE, printed circuit
38	—	BOARD, main
39	26-84104M01	HEATSINK
40	—	J350 (refer to main board parts list)
41, 42	3-84208M01	SCREW, washer M3 x 0.5 x 8.0
43	—	FRONT END: single/dual
44	15-84143M01	HOUSING connector base dc
45	29-84167M01	TERMINAL, round
45A	2-84334M01	NUT, terminal M3
46	15-84144M01	HOUSING, connector cover dc
47	—	BOARD, power interconnnect
48	3-84208M01	SCREW, washer M3 x 0.5 x 8.0
49	3-84208M12	SCREW, Phillips M4 x 0.7 x 9.0
50	15-84873N01	COVER, VCO
51	3-84208M14	SCREW, washer M2.5 x 0.45 x 8.0
52	26-84142M01	HEATSINK (25/30 W)
53	3-84208M01	SCREW, washer M3 x 0.5 x 8.0
54	—	HYBRID, 25/30 W PA
55	3-84208M01	SCREW, washer M3 x 0.5 x 8.0
56	3-84208M14	SCREW, washer M2.5 x 0.45 x 8.0
57	15-84141M01	COVER, heatsink
58	9-82442E11	J300 CONNECTOR, antenna
59	27-84061M01	CHASSIS
60	3-84208M01	SCREW, washer M3 x 0.5 x 8.0
61	—	BOARD PA interconnect
62	26-84102M01	SHIELD, wall transmitter
63	3-84208M01	SCREW, washer M3 x 0.5 x 8.0
64	3-84208M12	SCREW, Phillips M4 x 0.7 x 9.0
65	15-84174M01	COVER, bottom
66	—	HYBRID, harmonic filter
67	26-84176M01	SHIELD, PA
68	55-84300B01	HANDLE
69	—	HYBRID, 6/10 W PA
70	—	HYBRID, low level amplifier
71	3-84208M01	SCREW, washer M3 x 0.5 x 8.0
72	—	HYBRID, VCO
73	32-84178M01	GASKET, rf (19 inches)
74	3-84208M01	SCREW, washer M3 x 0.5 x 8.0
75	3-84208M11	SCREW, washer M3.5 x 0.6 x 14.0
76	26-84103M01	SHIELD, synthesizer (std lock models)
77	15-84147M01	COVER, synthesizer
78	3-84208M01	SCREW, washer M3 x 0.5 x 8.0
79	—	BOARD, standard lock synthesizer UHF
80	3-84208M01	SCREW, washer M3 x 0.5 x 8.0
81	14-84170M01	INSULATOR, synthesizer cover
82	43-83557N01	INSERT, chassis plug
83	2-7003	NUT, 8-32 x 5/16 x 1/8"
84	15-84221N01	PAD, foil
85	14-84172M01	INSULATOR, power board
86	64-84169M01	PLATE NUT, cover side; 4 used
87	64-84168M01	PLATE NUT, cover rear; 3 used
88	4-84205N01	CLIP, ground
89	14-84171M01	INSULATOR
90	15-82221N01	COVER, connector (microphone)
91	15-82222N01	COVER, connector (accessory)
92	32-84178M01	GASKET rf (11.6 inches) European Models
93	32-84178M01	GASKET, rf (8.3 inches) European Models
94	3-84208M14	SCREW, washer M2.5 x 0.45 x 8.0
95	32-83854N02	BRAID
96	32-83854N01	BRAID
97	42-82014P01	CLIP, ground
98	—	BOARD, *Fast-Lok*, synthesizer UHF
99	—	ASSEMBLY, VCO feed-thru
100	26-82142P01	SHIELD, synthesizer (*Fast-Lok* models)
101	64-84105M01	CARRIER, VCO (std. lock models)
102	64-83089N01	CARRIER, VCO (*Fast-Lok* models)
103	75-82200H03	PAD

TRN4678A Tray with Latch, Mounting — PL-7254-B

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
201	4-8285	WASHER, flat; 4 used
203	3-138021	SCREW, tapping; 10-16 x 3/4"; 4 used
203	3-139926	SCREW, tapping; 10-16 x 1-1/2"; 4 used
206	7-84196M01	BRACKET mounting tray
209	3-84195M01	SCREW mounting rear; 2 used
210	3-84194M01	SCREW, mounting front; 2 used
213	55-84201M01	LATCH; 2 used
214	4-119332	WASHER, lock #10 split; 4 used
215	46-82540N01	CHANNEL, rubber

TRN4679A Tray, Mounting with Lock, Right-Hand — PL-7255-B

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
203	3-138021	SCREW, tapping; 10-16 x 3/4"; 4 used
203	3-139926	SCREW, tapping; 10-16 x 1-1/2"; 4 used
206	7-84196M02	BRACKET, mounting tray, right hand lock
209	3-84195M01	SCREW, mounting rear; 2 used
210	3-84194M01	SCREW, mounting front; 2 used
211	55-84224M01	LOCK
213	55-84201M01	LATCH; 2 used
	45-84200M01	CAM
215	46-82540N01	CHANNEL, rubber

TRN4680A Tray, Mounting with Lock, Left-Hand — PL-7256-A

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
203	3-138021	SCREW, tapping; 10-16 x 3/4"; 4 used
203	3-139926	SCREW, tapping; 10-16 x 1-1/2"; 4 used
206	7-84196M03	BRACKET, mounting tray, left-hand lock
209	3-84195M01	SCREW, mounting rear; 2 used
210	3-84194M01	SCREW, mounting front; 2 used
211	55-84224M01	LOCK
213	55-84201M01	LATCH; 2 used
	45-84200M01	CAM
215	46-82540N01	CHANNEL, rubber

TRN4673A Cover, Top — PL-7247-A

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
	15-82200H03	PAD
	75-82200H01	PAD

note: For parts not listed in the above parts list, refer to the radio set mechanical parts list.

TRN5367A Chassis Hardware Kit — PL-8033-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		connector, receptacle:
J357	9-84135B02	female, single contact (phono)
		mechanical parts
	3-84208M01	SCREW, tapping, M3 x 0.5 x 8; 2 used

note: For parts not listed in the above parts list refer to the radio set mechanical parts list.

TRN4671A Tuning Tool Kit — PL-7249-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
	66-83395A01	TOOL, align
	66-84974L01	TOOL, tuning

TRN4675A Standard Mounting Hardware — PL-7272-A

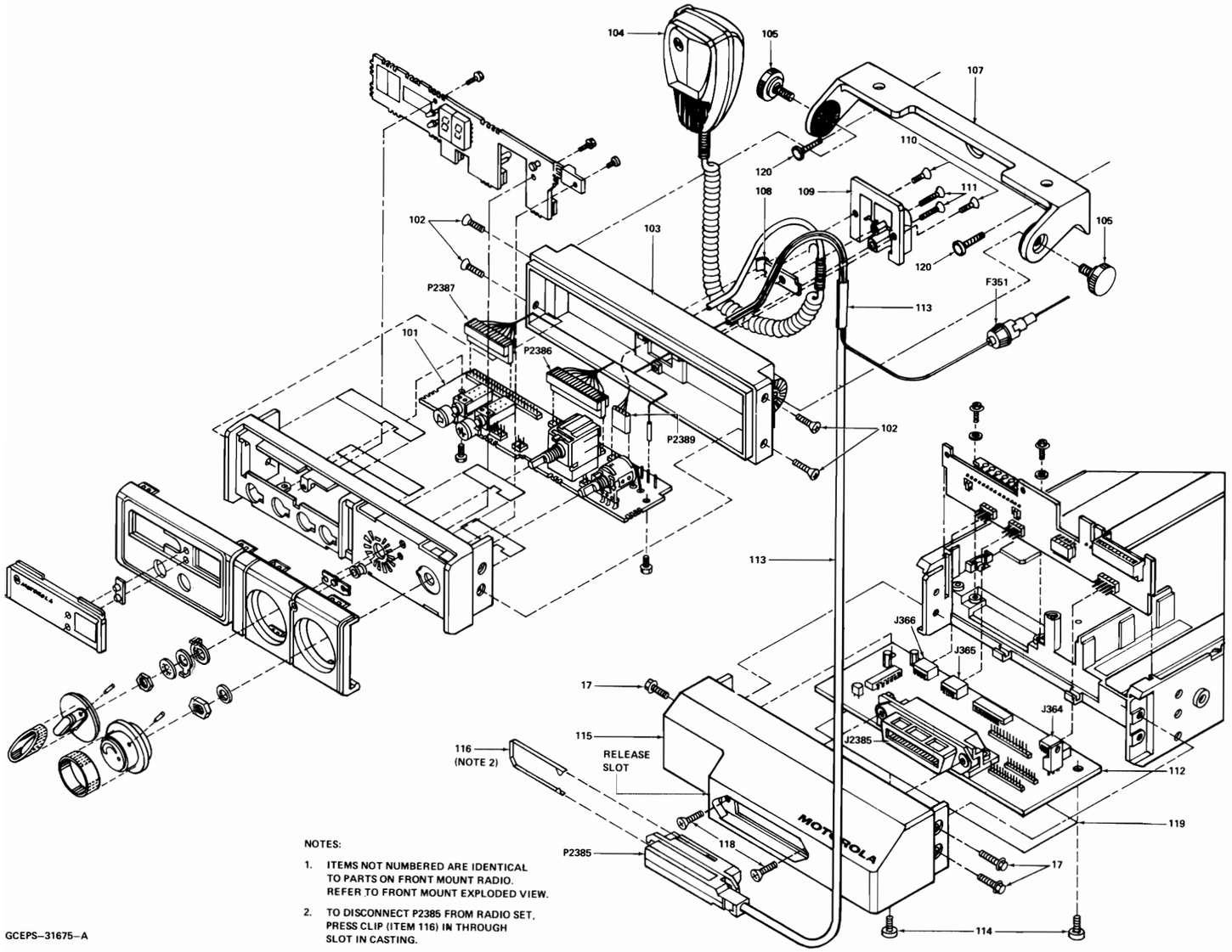
REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
201	4-8285	WASHER, flat; 4 used
203	3-138021	SCREW, tapping; 10-16 x 3/4"; 4 used
203	3-139926	SCREW, tapping; 10-16 x 1-1/2"; 4 used
206	7-84196M01	BRACKET, mounting tray
209	3-84195M01	SCREW, mounting rear; 2 used
210	3-84867M01	SCREW, mounting front; 2 used
214	4-119332	WASHER, lock #10 split; 4 used
215	46-82540N01	CHANNEL, rubber

TRN4778A Tuning Probe Adaptor — PL-8330-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
	43-00055M01	SLEEVE, tuning adjustment
	81-82603N01	TESTER, magnetic field probe

UHF *MCX100* RADIO EXPLODED VIEWS AND MECHANICAL PARTS LISTS

REMOTE MOUNT RADIO SET WITH CONTROL HEAD



NOTES:

1. ITEMS NOT NUMBERED ARE IDENTICAL TO PARTS ON FRONT MOUNT RADIO. REFER TO FRONT MOUNT EXPLODED VIEW.
2. TO DISCONNECT P2385 FROM RADIO SET, PRESS CLIP (ITEM 116) IN THROUGH SLOT IN CASTING.

parts list

TRN4772A Remote Hardware Kit — PL-7424-B

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
101	—	BOARD, remote switch
102	3-84208M07	SCREW, M3 x 0.5 x 8, cover; 4 used
103	15-84877M01	COVER, control head
104	—	MICROPHONE (refer to Microphone section)
105	1-80761D701	KNOB, control head mounting; 2 used
106		NOT USED
107	7-84891M01	BRACKET, trunnion
108	7-84899M01	BRACKET, strain relief
109	15-84881M01	STRAIN RELIEF
110	3-84208M07	SCREW, M3 x 0.5 x 8; 2 used
111	3-84208M08	SCREW, M3 x 0.5 x 20; 2 used
112	—	BOARD, remote interface
113	—	CABLE, remote (TKN8171A or TKN8172A)
114	3-84208M01	SCREW, mounting; M3 x 0.5 x 8
115	64-84876M01	COVER, remote transceiver (front)
116	—	CLIP, plug retainer (p/o TKN8171A, 8172A)
118	3-141143	SCREW, 4-40; 2 used
119	14-82125N01	INSULATOR, front panel
120	3-140147	SCREW, tapping; 10-32 x 3/4"; 3 used
	or 3-140148	SCREW, tapping; 10-32 x 1-1/2"; 3 used
non-referenced items		
	43-84136M01	SPACER, standoff; 4 used

UHF *MCX100* RADIO EXPLODED VIEWS AND MECHANICAL PARTS LIST

FRONT PANEL LENS DETAILS

MCX 100 FRONT PANEL LENSES

TYPE "A" LENSES--BASIC RADIO MODELS

REFERENCE ITEM 1	2	3	4	LENS KIT NUMBER	LENS PART NUMBER
				TRN4638A	61-84153M01
		●		TRN4639A	61-84153M02
	●		●	TRN4640A	61-84153M03
●				TRN4644A	61-84153M11
●		●		TRN4645A	61-84153M12
●	●	●		TRN4646A	61-84153M14

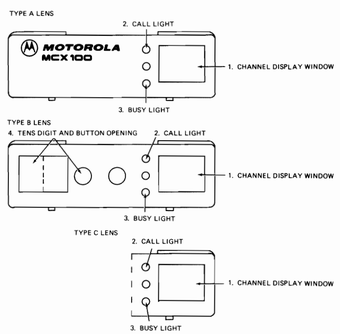
TYPE "B" LENSES--SELECT 5 WITH 10/100--CALL OPTIONS OR PL/DPL WITH SELECTABLE CODE OPTIONS

REFERENCE ITEM 1	2	3	4	LENS KIT NUMBER	LENS PART NUMBER
				TRN4652A	61-84153M01
		●		TRN4801A	61-84153M28
	●		●	TRN4647A	61-84153M06
			●	TRN4653A	61-84153M25
		●	●	TRN4800A	61-84153M27
	●	●	●	TRN4642A	61-84153M08
●				TRN4654A	61-84153M24
●		●		TRN4802A	61-84153M29
●	●	●		TRN4647A	61-84153M16
●			●	TRN4655A	61-84153M26
●		●	●	TRN4803A	61-84153M30
●	●	●	●	TRN4648A	61-84153M18

TYPE "C" LENSES--SELECT 5 MODELS WITH OPTIONS REQUIRING THUMBWHEEL SWITCHES

REFERENCE ITEM 1	2	3	4	LENS KIT NUMBER	LENS PART NUMBER
				TRN4804A	61-84153M31
	●	●		TRN4643A	61-84153M10
●				TRN4650A	61-84153M21
●		●		TRN4651A	61-84153M22
●	●	●		TRN4649A	61-84153M20

● DENOTES ITEM PRESENT IN LENS



GBEPS-32318-A

BUTTON PANEL DETAILS

MCX 100 FRONT PANEL BUTTON PANELS

TYPE I OPENING WITHOUT "MOTOROLA" EMBLEM

REFERENCE ITEM 1	2	3	BUTTON PANEL KIT NUMBER	BUTTON PANEL PART NUMBER
			TRN4623A	64-84145M01
●			TRN4635A	64-84145M15
	●		TRN4624A	64-84145M02
		●	TRN4636A	64-84145M16
●	●		TRN4807A	64-84145M18
●		●	TRN4625A	64-84145M03
	●	●	TRN4637A	64-84145M17
●	●	●	TRN4626A	64-84145M04

TYPE I OPENING WITH "MOTOROLA" EMBLEM

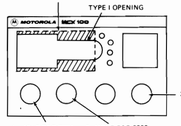
REFERENCE ITEM 1	2	3	BUTTON PANEL KIT NUMBER	BUTTON PANEL PART NUMBER
			TRN4805A	64-84145M05
●			TRN4634A	64-84145M14
	●		TRN4806A	64-84145M06
●	●		TRN4808A	64-84145M19
●		●	TRN4629A	64-84145M07
●	●	●	TRN4630A	64-84145M08

TYPE II OPENING WITH "MOTOROLA" EMBLEM

REFERENCE ITEM 1	2	3	BUTTON PANEL KIT NUMBER	BUTTON PANEL PART NUMBER
			TRN4627A	64-84145M09
●			TRN4633A	64-84145M13
	●		TRN4628A	64-84145M10
		●	TRN4982A	64-84145M22
●	●		TRN4809A	64-84145M20
●		●	TRN4631A	64-84145M11
	●	●	TRN4983A	64-84145M21
●	●	●	TRN4632A	64-84145M12

● DENOTES HOLE PRESENT IN BUTTON PANEL

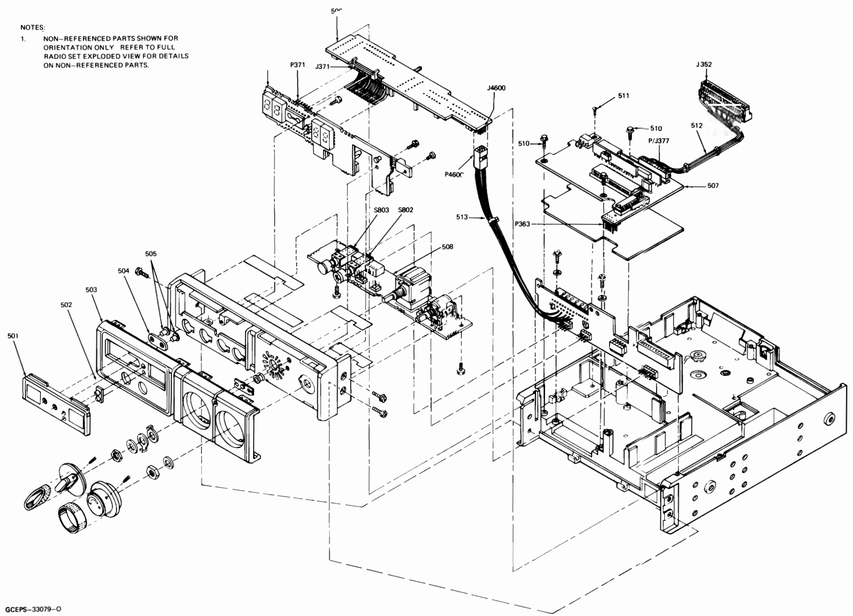
TYPE II OPENING FOR THUMBWHEEL SWITCHES OR CHANNEL SCAN CONTROLS



GBEPS-32319-A

SELECTABLE PL/DPL/SINGLE TONE RADIO SET

NOTES:
1. NON-REFERENCED PARTS SHOWN FOR ORIENTATION ONLY. REFER TO FULL RADIO SET EXPLODED VIEW FOR DETAILS ON NON-REFERENCED PARTS.



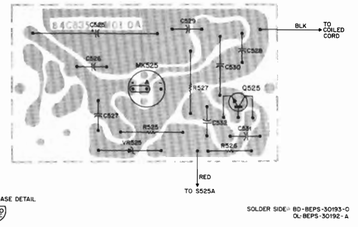
GCEPS-33079-O

parts list

Selectable PL/DPL Mechanical Parts PL-7623-A

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
501	—	refer to lens chart
502	61-82106N01	LENS, dispay LED
503	—	refer to front, panel chart
504	75-84198M01	PAD, button
505	38-84113M01	BUTTON, code select
506	—	selectable PL/DPL control board
507	—	PL/DPL board
508	—	SWITCH BOARD
509	—	DISPLAY BOARD
510	3-84208M01	SCREW, washer: M3 x 0.5 x 8.0
511	3-84208M03	SCREW, M2.5 x 0.45 x 6.0
512	—	CABLE, PL/DPL (refer to circuit board parts list)
513	—	CABLE, selectable PL/DPL (refer to front panel parts lists)

MICROPHONE CIRCUIT BOARD



TRANSISTOR BASE DETAIL

SOLDER SIDE - 80-BEPS-30193-O
OL-BEPS-30192-A

SHOWN FROM SOLDER SIDE

parts list

TRN4700A Microphone Hardware, Standard
TRN4701A Microphone Hardware, Signaling — PL-7182-C

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
1	3-135102	SCREW, tapping, 4-40 x 1/4"; 2 used
2	3-139999	SCREW, tapping, 6-19 x 3/8"; 3 used
3	3-140000	SCREW, tapping, 6-19 x 3/4"; 3 used
5	1-80731D39	HOUSING, riveted; microphone rear (TRN4701A) includes:
	41-84190M01	SPRING, plunger
	42-10219A52	C-RING, retainer
	45-82336M01	PLUNGER, actuator
	or 1-80709B93	HOUSING, riveted, microphone rear (TRN4700A)
6	15-82662M23	HOUSING, microphone flat
7	15-82896M01	HOUSING, microphone adapter
8	30-83385L01	CABLE (TRN4701A), with connector and strain relief, 5-conductor (W526)
	or 30-83731M03	CABLE (TRN4700A), with connector and strain relief, 4-conductor (W525)
9	32-82703B01	GASKET, microphone
10	37-12706	GROMMET; 2 used
11	38-84559B03	BUTTON, microphone
12	40-82263G02	S525, switch, push-to-talk
13	1-80762D02	S526 switch assembly, hang-up (TRN4701A)
14	42-852710	STRAP
15	—	part of ref. item 8
16	35-82652K01	BAFFLE, microphone
	non-referenced items	
	13-84599B02	EMBLEM
	33-82102N01	NAMEPLATE (TMN1024A)
	33-82102N02	NAMEPLATE (TMN1025A)
	1-851093	CLIP, hang-up; includes:
	3-122830	SCREW, hang-up clip mounting, 8-15 x 1/2" tapping; 2 used
	38-84383D01	CAP, protective; 2 used
	1-80731D40	ASSEMBLY lead and terminal, red includes:
	29-82713M01	TERMINAL, single contact
	1-80731D38	ASSEMBLY wire and terminal wht-blu (TRN4701A) includes:
	29-82713M01	TERMINAL, single contact

TSN6031A Mobile Speaker (8-foot cable)
TSN6032A Mobile Speaker (17-foot cable) — PL-7186-A

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
1	15-84981B10	COVER, rear
2	7-84568B02	BRACKET, trunnion
3	3-136756	SCREW, tapping; 10-16 x 5/8"; 3 used
4	3-84244C03	SCREW, wing; 2 used
5	50-84561B07	SPEAKER, dynamic; 5"; 2 ohm
6	32-84564B01	GASKET, speaker
7	13-82671M05	BEZEL, speaker
8	14-84566B01	HOUSING, connector; 2 position
9	42-82018H05	RETAINER, cable
10	1-80731D32	ASSEMBLY, cable (TSN6031A); includes
	9-84151B03	CONTACT, receptacle; female; 2 used
	30-83155H01	CABLE, 2-conductor; 8 feet
	or 1-80734D90	ASSEMBLY, cable (TSN6032A); includes
	9-84151B03	CONTACT, receptacle; female; 2 used
	30-83155H01	CABLE, 2-conductor; 17 feet
11	3-140001	SCREW, tapping; 10-16 x 5/8"; 4 used
	non-referenced items	
	33-83102N03	NAMEPLATE (TSN6031A)
	33-82102N06	NAMEPLATE (TSN6032A)

TRN4699A Microphone Board — PL-7183-A

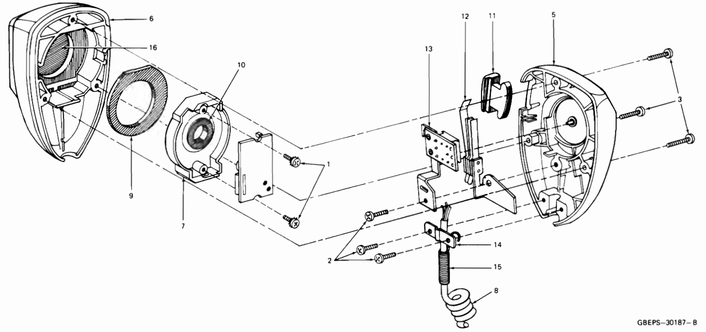
REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed: uF ± 5%; 50 V; unless otherwise stated:
C525	23-84669A24	1 + 150-10%; 25 V
C526	21-11021E13	.001
C527	21-11022M29	30 pF
C528	21-11021E13	.001
C529	21-11022M29	30 pF
C530	8-84637L12	.047 ± 10%; 250 V
C531	21-11022M50	220 pF
C532	21-11021E13	.001
		cartridge:
MK525	50-82825M01	electret
		transistor: (see note)
Q525	48-869642	NPN; type M9642
		resistor, fixed: ± 5%; 1/4 W;
R525	6-11009C57	2.2k
R526	6-11009C97	100k
R527	6-11009C19	56
		switch:
S525	—	dpst, refer to mechanical parts list
		voltage regulator: (see note)
VR525	48-82256C54	Zener type; 12 V

note: For optimum performance, diodes, transistors, and integrated circuits must be ordered by Motorola part numbers.

TRN4810A Microphone Hardware Standard Remote
TRN4811A Microphone Hardware Signaling Remote — PL-7471-B

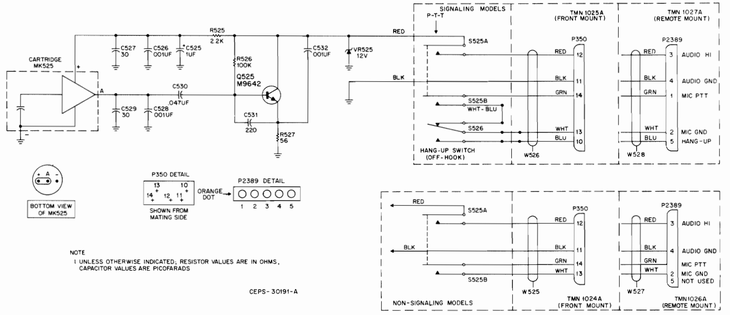
REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
1	3-135102	SCREW, tapping; 4-40 x 1/4"; 2 used
2	3-139999	SCREW, tapping; 6-19 x 3/8"; 3 used
3	3-140000	SCREW, tapping; 6-19 x 3/4"; 3 used
5	1-80731D39	HOUSING, microphone rear TRN8411A, includes:
	41-84190M01	SPRING, plunger
	45-82336N01	PLUNGER, actuator
	or 1-80709B93	HOUSING, microphone rear TRN8410A, includes:
	42-82705B01	WASHER, backup
	4-82707B01	WASHER, flat
	5-855939	RIVET, shoulder
	15-82662M13	HOUSING, microphone rear
6	15-82662M23	HOUSING, microphone flat
7	15-82896M01	HOUSING, microphone adapter
8	1-80734D76	ASSEMBLY coil cord; 4 wire (TRN4810A) includes:
	14-84277D26	P2389 RECEPTACLE, housing
	9-84279D02	PIN, terminal, female; 4 used
	29-83277G01	LUG, piercing; 4 used
	41-852707	SPRING, strain relief; 2 used
	30-82565B37	CABLE, coil cord (W528)
	or 1-80734D77	ASSEMBLY coil cord; 5 wire (TRN4811A) includes:
	14-84277D26	P2389 RECEPTACLE, housing
	9-84279D02	PIN, terminal, female; 5 used
	29-83277G01	LUG, piercing; 5 used
	41-852707	SPRING, strain relief; 2 used
	30-82565B38	CABLE, coil cord (W527)
9	32-82703B01	GASKET, microphone
10	37-12706	GROMMET; 2 used
11	38-84559B03	BUTTON, microphone
12	40-82263G02	S525, switch, push-to-talk
13	1-80762D02	S526, switch assembly, hang-up (TRN4811A)
14	42-852710	STRAP, plate
15	—	part of ref. item 8
16	35-82652K01	BAFFLE, microphone
	non-referenced items	
	13-84599B02	EMBLEM
	33-82102N04	NAMEPLATE (TMN1026A)
	33-82102N05	NAMEPLATE (TMN1027A)
	1-851093	CLIP, hangup; includes:
	3-122830	SCREW, hang-up clip mounting, 8-15 x 1/2" tapping; 2 used
	38-84383D01	CAP, protective; 2 used
	1-80731D40	ASSEMBLY lead and terminal, red includes:
	29-82713M01	TERMINAL, single contact
	1-80731D38	ASSEMBLY wire and terminal wht-blu (TRN4811A) includes:
	29-82713M01	TERMINAL, single contact

MICROPHONE EXPLODED VIEW



GBEPS-30187-B

MICROPHONE SCHEMATIC DIAGRAM



CEPS-30191-A

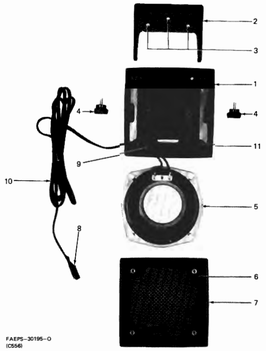
MCX100 SPEAKER

MODELS TSN6031A AND TSN6032A

MCX100 MOBILE MICROPHONES

MODELS TMN1024A, TMN1025A
TMN1026A, AND TMN1027A

SPEAKER PARTS



FAEPS-30196-O
105548

Microphone Model Complement

TMN1024A Microphone, Standard Front Mount
TRN4699A Board
TRN4700A Mic Hardware, Standard Front

TMN1025A Microphone, Signaling Front Mount
TRN4699A Board
TRN4701A Mic Hardware, Signaling Front

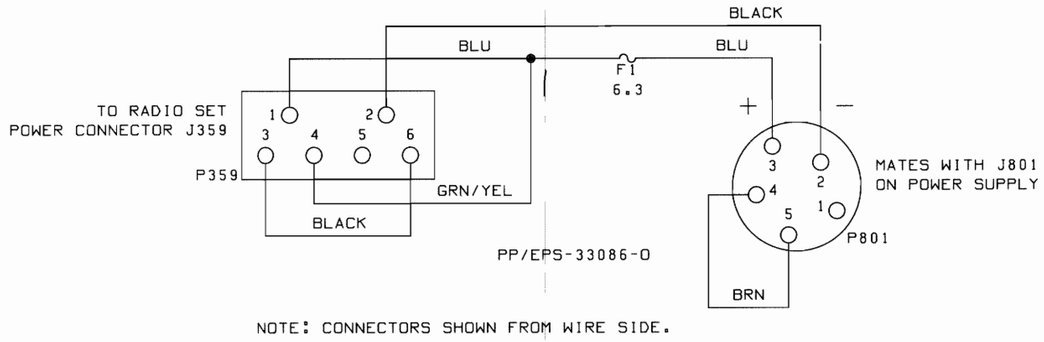
TMN1026A Microphone, Standard Remote Mount
TRN4699A Board
TRN4810A Mic Hardware, Standard Remote

TMN1027A Microphone, Signaling Remote Mount
TRN4699A Board
TRN4811A Mic Hardware, Signaling Remote

SPEAKER & MOBILE MICROPHONES

68P81045E94-D
5/19/83- PHI

BASE STATION POWER CABLE AND SPEAKER TRAY



NOTE: CONNECTORS SHOWN FROM WIRE SIDE.

FUNCTION

Provides interconnection between GPN6101A Power Supply and *MCX100* Radio set.

NOTE

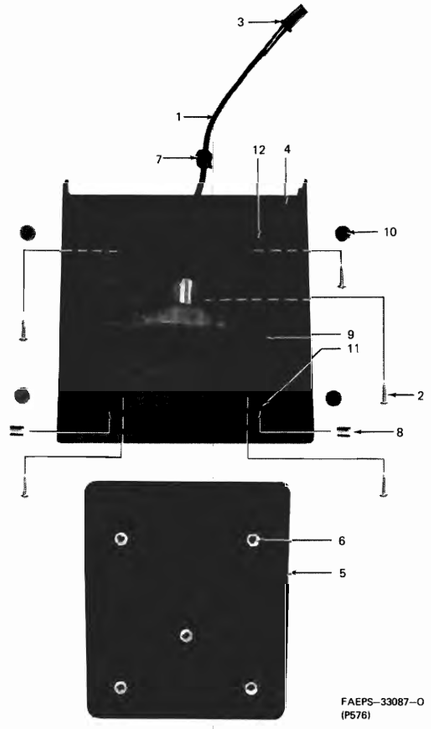
Refer to Power Supply section of this manual for information on cables used with TPN series power supplies.

parts list

TKN8208A Low Power Cable Kit — PL-7637-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		fuse:
F1	65-84711C04	6.3 amp
		connector, plug:
P359	15-84192M01	HOUSING, 6-contact
P801	23-84749B01	male, 5-contact
		mechanical parts
	1-80733D11	assembly, jumper and terminal; includes:
	9-84151B05	TERMINAL; 2 used
	1-80737D34	assembly power cable; includes:
	29-84151L05	TERMINAL; 2 used
	9-84151B03	CONTACT, receptacle
	37-135566	TUBING, 1/4" heatshrink
	1-80737D35	assembly blue wires includes:
	5-82050	EYELET
	14-84710C01	BODY, fuseholder
	41-84707C01	SPRING
	42-84754B01	CLAMP
	2-84745B01	NUT
	15-84746B02	SHELL
	3-84747B01	SCREW, set

BASE STATION SPEAKER TRAY



TRN4898A Base Station Mounting Tray — PL-7633-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
1	1-80735D98	CABLE, with connector pins
2	3-122916	SCREW
3	14-84566B01	HOUSING, cable connector
4	15-82086N01	HOUSING
5	15-82087N01	COVER
6	38-82132N01	NUT, clamp-on
7	42-82018H18	GROMMET, cable
8	42-82105N01	CLIP, speaker
9	50-84401D01	SPEAKER
10	55-82104N01	BUTTON, detent
11	75-82172N01	PAD, speaker
12	75-83951F01	FOOT, bumper
		non-referenced item
	33-82102N07	NAMEPLATE

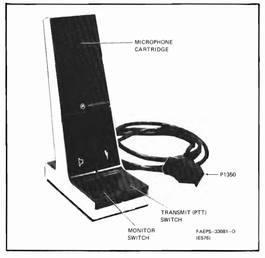


Figure 1. Microphone Controls

1. DESCRIPTION

1.1 The TMN1028A Desk Microphone contains a microphone and preamplifier circuit board, and a dual-action "Transmit" switch which allows easy operation for either hand-held or desk-top use in carrier squelch applications. The TMN1029A Desk Microphone is the same as the TMN1028A except that it contains an additional dual action "Monitor" switch for use in coded squelch applications.

1.2 All electrical components are mounted vertically in the housing with the microphone cartridge at the top and the switches at the bottom. A stranded cord with connector is routed out through the back at the base of the housing.

2. INSTALLATION

Before connecting the desk microphone to the radio set, verify that printed circuit board jumpers JU1 and JU2 are configured correctly for the system application. Microphones are shipped from the factory with both jumpers installed. Jumper JU2 (Model TMN1029A only) is removed when it is necessary to prevent an operator from transmitting without first monitoring a channel to verify it is clear. With JU2 removed, both the MONITOR and TRANSMIT switches must be activated before transmitting.

Refer to paragraph 4.1 for front cover removal to gain access to the jumpers when it is necessary to change the microphone jumper configuration.

3. OPERATION

3.1 GENERAL MICROPHONE PROCEDURE

To assure good audio transmission quality, observe the following general microphone practices.

- Keep microphone approximately 8 inches away from the mouth. The distance may vary depending on the user's tone of voice.
- Speak clearly and directly into the microphone at a normal conversational level.

3.2 TRANSMIT SWITCH

When pressed and held, the dual- action TRANSMIT switch causes the associated transmitter to be keyed.

3.3 MONITOR SWITCH

The MONITOR switch is a dual-action switch which operates in the same manner as the TRANSMIT switch.

The MONITOR switch (Model TMN1029A only) when activated, allows the operator to monitor a channel to be sure it is clear before transmitting. In systems using coded squelch, this feature is an FCC requirement. If jumper JU2 is removed, the operator must press and hold both the MONITOR and TRANSMIT switches before he can transmit. Releasing either switch ends the transmission.

4. MAINTENANCE

4.1 DISASSEMBLY

Step 1. At the rear of the microphone, remove the four screws that secure the front cover to the housing; then remove the front cover.

Step 2. On the bottom of the microphone, remove the four screws that secure the baseplate to the housing then remove the baseplate.

Step 3. Remove the shaft retainer clip from the pivot shaft (see Figure 2).

Step 4. Remove the cord grommet from the U- shaped slot. (See Figure 3).

Step 5. Slide both halves of the pivot shaft toward the center releasing the shaft from the retaining holes in the housing.

Step 6. Swing the lower edge of the printed circuit board (including switches) forward to disengage the upper portion of the circuit board from the housing. Remove the circuit board.

4.2 ASSEMBLY

Assembly is essentially the reverse order of disassembly.

4.3 TESTING

4.3.1 Test Equipment Required

- S-1063 Motorola Solid-State DC Multimeter or equivalent
- S-1053 Motorola Solid-State AC Voltmeter or equivalent
- R-1004 Motorola General Purpose Dual Trace 15 MHz Oscilloscope.

4.3.2 Test Procedure

NOTE
Potentiometer R1 is factory set and field adjustment is not required.

The microphone can be tested either while connected to its associated equipment or to the test setup as shown in Figure 4. Basic testing consists of checking resistances and dc voltages against the schematic diagram. Dynamic testing can be accomplished by speaking into the microphone and using an oscilloscope or ac voltmeter to monitor the amplification (gain) of the various stages. However, since a known dynamic input signal for field testing is not practicable, gain measurements are to be used only as indications of proper stage functioning. For that reason, no ac voltages are provided on the schematic.

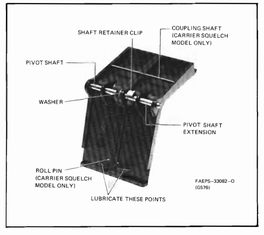


Figure 2. Pivot Shaft Detail

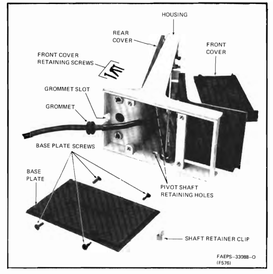


Figure 3. Microphone Assembly Detail

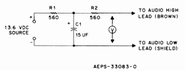


Figure 4. Test Setup

TMN1028A Model Complement

Item	Description	Ver
TRN4861A	Mic Circuit Board	0
TRN4820A	Mic Housing and Hardware	0

TMN1029A Model Complement

Item	Description	Ver
TRN4861A	Mic Circuit Board	0
TRN4821A	Mic Housing and Hardware	0

parts list

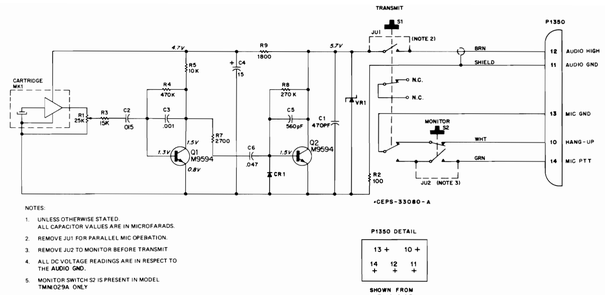
TRN4861A Microphone Circuit Board — PL-7604-O

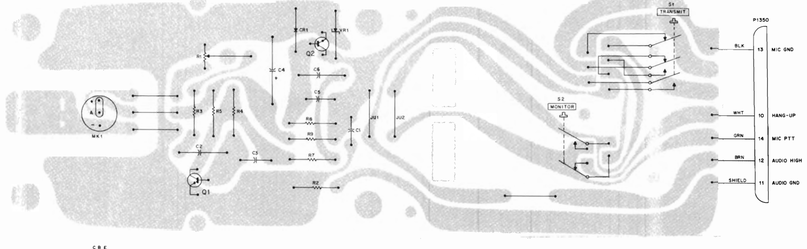
REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed: uF ± 10%; unless otherwise stated
C1	21-82187B45	470 pF; 500 V
C2	8-84637L06	.015; 400 V
C3	21-82187B44	.001; 100 V
C4	23-84665F09	15 + 150 -10%; 25 V
C5	21-82187B06	560 pF; 500 V
C6	8-84637L12	.047; 250 V
		diode:
CR1	48-83654H01	Silicon
		cartridge, microphone:
MK1	50-82825M01	miniature
		transistor: (see note)
Q1,2	48-869594	NPN; type M9594
		resistor, fixed: ± 5%; 1/4 W; unless otherwise stated
R1	18-84944C02	variable; 25k
R2	6-11009C25	100
R3	6-11009C77	15k
R4	6-11009D14	470k
R5	6-11009C73	10k
R7	6-11009C59	2.7k
R8	6-11009D06	270k
R9	6-11009C55	1.8k
		voltage regulator:
VR1	48-82256C38	Zener; 9.1 V

TRN4820A & TRN4821A Microphone Housing & Hardware Kit — PL-7605-A

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		switch, leaf:
S1,2	40-84711E02	2 section, multiple nonlocking contacts (TRN4820A)
	40-84711E03	2 section multiple nonlocking contacts (TRN4821A)
		mechanical parts
	2-10101A69	NUT, spring steel; 2 used
	3-135676	SCREW, tapping; 4-40 x 1/4 "; 3 used (switch)
	3-138809	SCREW, machine: 4-40 x 5/16"; 4 used (baseplate)
	3-140047	SCREW, tapping; 4-40 x 5/8"; 4 used (front cover)
	4-10058B10	WASHER, ("TEFLON") TRN4820A
	15-82978M03	COVER, front
	15-82978M01	COVER, rear
	15-84191E02	HOUSING
	22-82591C05	PIN, roll (TRN4820A)
	38-84184E06	BUTTON, left hand (TRN4820A)
	38-84184E03	BUTTON, left hand (TRN4821A) (monitor)
	38-84192E02	BUTTON, right hand (transmit)
	42-82143C05	CLAMP, cable
	42-84725E01	CLIP, retainer
	47-84183E01	SHAFT, button mounting pivot
	47-84194E01	SHAFT, extension
	47-84723E01	SHAFT, coupling (TRN4820A)
	64-82977M01	PLATE, base
	75-84722E01	PAD, base plate
	42-82143C05	CLAMP, cable
	30-82247N01	CABLE, 5-conductor
	37-82633B13	GROMMET

note: For optimum performance, diodes, transistors, and integrated circuits must be ordered by Motorola part numbers.





C B E
TRANSISTOR BASE DETAIL (PIN SIDE)

SHOWN FROM COMPONENT SIDE

SOLDER SIDE — SO-DEPS-29674-A
OL-DEPS-33084-A

DESK MICROPHONES

MODELS TMN1028A AND TMN1029A

DESK MICROPHONE

68P81048E29-A
1/19/83- PHI

parts list

TKN6948A Power Cable Kit — PL-6084-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		fuse, cartridge:
F602	65-86099	7.5 amp; 32 V; type 3AG; fast-blow
		connector, plug:
P601		includes:
	15-83293K01	INSULATOR, connector; 15-circuit
	29-84706E05	TERMINAL, pin; male; 4 used
	30-102864A21	WIRE, jumper; BLK
P602		includes:
	15-10183A52	INSULATOR, connector; 6-circuit
	29-82335A01	TERMINAL, pin; male; 4 used
		cable, power:
W601	30-84396L02	2-conductor; (14 ga.); 120" used
		fuseholder, in-line:
XF603		includes:
	14-82882A01	BODY, fuseholder
	14-82883A01	CAP, fuseholder
	41-82885A01	SPRING, compression
	42-82884A01	CLIP, fuseholder; 2 used
		non-referenced part
	37-134371	TUBING, heatsink (BLK) 1" length; 2 used

TKN6949A Power Cable Kit — PL-6085-A

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		fuse, cartridge:
F603	65-4165	15 amp; 35 V; fast-blow type
		connector, plug:
P601		includes:
	15-83956L01	INSULATOR, connector; 17-circuit
	29-82335A01	TERMINAL, pin; male; (large) 2 used
	29-84706E05	TERMINAL, pin; male; (small) 6 used
	30-102864A21	WIRE, jumper; BLK
P602		includes:
	15-10183A52	INSULATOR, connector; 6-circuit
	29-82335A01	TERMINAL, pin; male; 4 used
		cable, power:
W601	30-84396L02	2-conductor; (14 ga.); 120" used
		fuseholder, in-line:
XF603		includes:
	14-82882A01	BODY, fuseholder
	14-82883A01	CAP, fuseholder
	41-82885A01	SPRING, compression
	42-82884A01	CLIP, fuseholder; 2 used
		non-referenced part
	37-134371	TUBING, heatsink (BLK) 1" length; 2 used

TLN5274B Regulator Board — PL-5361-C

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed: uF: ± 10%; 50 V: unless otherwise stated
C1	8-829050G02	.022
C2	23-83908L01	100 + 75-10%; 25 V
C3, 4	8-829050G02	.022
		semiconductor device, diode: (see note)
CR5	48-82392B03	silicon
		transistor: (see note)
Q1, 2	48-869642	NPN; type M9642
		resistor, fixed: ± 5%; 1/2 W: unless otherwise stated
R1	6-125A41	470
R2	6-125A53	1.5k
R3	6-125A13	33
R4	17-82177B40	200; 5 W
R5, 6	6-126C41	470 ± 10%; 1 W
R7, 8	6-125A49	1k
R9, 10	6-125C73	10k ± 10% (note: Use is optional, determined at factory)
R11	6-125C51	1.2k ± 10%
		semiconductor device, diode: (see note)
VR1	48-83696E01	silicon; Zener type; 6.8 V ± 5%

note: Replacement diodes and transistors must be ordered by listed part number only for optimum performance.

parts list

TRN6282A Power Supply Chassis — PL-3349-I

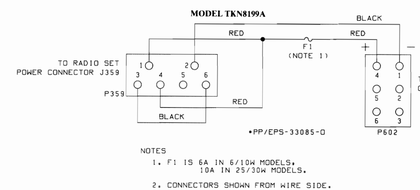
REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
C1	23-82464C08	**capacitor, fixed:** 11,000 uF + 75-10%; 35 V
CR1	48-84571H02	**semiconductor device, diode: (see note)** Bridge Rectifier Assembly; silicon
J1		**connector, receptacle:** includes:
	15-10183A53	INSULATOR, 6-contact
	29-82336A01	CONTACT, female; 4 req'd. (p/o Model TLN5219A)
F1	65-42092	**fuse, cartridge:** fast-blow type; 2A
P1	30-83212F01	**line cord:** includes: ac plug
Q3	48-869807	**transistor: (see note)** PNP; type M9807
Q4	48-869639	NPN; type M9639
S1	40-84241G04	**switch, slide:** dpst
T1	25-83594E02	**transformer, power:** pri: res, 2.75 ohms sec: res 0.11 ohm
TB1	31-121700	**terminal strip:** 8-terminals: no. 2 & 7 mtg.
XF1	9-82083C01	**fuseholder:** extractor post type
		non-referenced items
	1-80745B56	WIRE & LUG ASSEMBLY, includes:
	29-824456	LUG, ring tongue
	3-2977	SCREW, machine; 6-32 x 1-1/8"; 4 req'd.
	4-7569	WASHER, flat; .145 x .312 x .027"; 4 req'd.
	4-7650	WASHER, lock; #6 (split); 2 req'd.
	4-84496C01	WASHER, shoulder; 4 req'd.
	26-84923B06	HEATSINK
	29-5248	LUG, soldering; #6; 2 req'd.
	1-80745B57	DIODE BRACKET ASSEMBLY includes:
	1-80745B56	WIRE & LUG ASSEMBLY includes:
	29-824456	LUG, ring tongue
	1-80745B58	WIRE & LUG ASSEMBLY, includes:
	29-824456	LUG, ring tongue
	1-80745B60	WIRE & LUG ASSEMBLY, includes:
	29-824456	LUG, ring tongue
	1-80745B61	WIRE & LUG ASSEMBLY, includes:
	29-824456	LUG, ring tongue
	3-134168	SCREW, tapping; 4-40 x 1/4"; 2 req'd.
	3-134268	SCREW, tapping; 4-40 x 7/16"; 2 req'd.
	4-114057	WASHER, flat; .125 x .312 x .032"
	7-83095F02	BRACKET, circuit board
	14-84268A01	INSULATOR, transistor; 520 x .660"
	14-84525G01	INSULATOR, transistor (TO66 base)
	29-5261	LUG, soldering; #6; 2 req'd.
	29-5369	LUG, soldering; #4
	1-80745B88	HOUSING ASSEMBLY, includes:
	13-868710	DECAL, patent
	15-83096F02	HOUSING
	1-80778B37	CHASSIS ASSEMBLY, includes:
	1-80747B60	WIRE & LUG ASSEMBLY, includes:
	29-82336A01	CONTACT, female
	1-80747B61	WIRE & LUG ASSEMBLY, includes:
	29-82336A01	CONTACT, female
	1-80747B62	WIRE & LUG ASSEMBLY, includes:
	29-82336A01	CONTACT, female
	1-80747B63	WIRE & LUG ASSEMBLY, includes:
	29-82336A01	CONTACT, female
	2-1365	NUT, hex; 8-32 x 5/16 x 1/8"; 4 req'd.
	2-7005	NUT, hex; 6-32 x 1/4 x 3/32"; 14 req'd.
	2-9627	NUT, hex; 4-40 x 3/16 x 3/32"; 2 req'd.
	2-119913	NUT, 8-32 x 11/32"
	3-2979	SCREW, machine; 6-32 x 3/8"; 7 req'd.
	3-7312	SCREW, machine; 8-32 x 3/4"
	3-7346	SCREW, machine; 6-32 x 3/4"
	3-139085	SCREW, machine; 4-40 x 5/16"; 2 req'd.
	3-490773	SCREW, machine; 6-32 x 9/16"; 4 req'd.
	4-2645	WASHER, lock; #6 (split); 12 req'd.
	4-8746	WASHER, lock; #8 (split); 4 req'd.
	4-114563	WASHER, lock; #4 (split); 2 req'd.
	4-82418B88	WASHER, insulator; .125 x .250 x .010"; 2 req'd.
	13-84630D04	ESCUTCHEON
	27-83252N01	CHASSIS
	42-82018H01	RETAINER, cable
	42-83415C01	CLIP, capacitor mounting
	43-82599M01	SPACER, 4 req'd.
	75-84215A02	BUMPER, recessed; 4 req'd.
	3-139854	SCREW, tapping; 6-32 x 3/8"; 6 req'd.
	3-134168	SCREW, tapping; 4-40 x 1/4"; 2 req'd.
	3-139138	SCREW, tapping; 10-32 x 3/8"; 3 req'd.
	33-84035E05	NAMEPLATE, model number
	42-10217A02	STRAP, cable harness; 3 req'd.
	54-84347M01	LABEL, warning
	9-10454A04	CONN. (YELLOW)

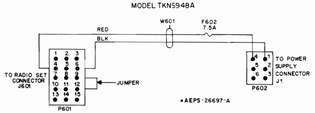
note: Replacement diodes and transistors must be ordered by listed part number only for optimum performance.

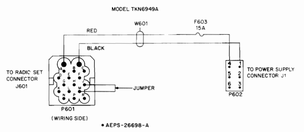
TKN8199A Power Cable Kit — PL-7636-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		fuse:
F1	65-10266	10 amp
	or 65-15270	6 amp
		connector, plug:
P359	15-84192M01	HOUSING, 6-contact
P602	15-10183A52	HOUSING, 6-contact
		mechanical parts
	1-80737D31	assembly power cable; includes:
	42-82883A01	CAP, fuse holder
	42-82884A01	CLIP, fuse
	29-82335A01	TERMINAL, male
	30-84396L02	CABLE, 2-conductor
	37-13470	TUBING, heatshrink; 3/4" (BLK)
	37-134371	TUBING, heatshrink; 3/8" (BLK)
	9-82845L01	CRIMP, connector
	1-80737D32	ASSEMBLY, red wire and lug; includes:
	9-84151B03	RECEPTACLE, single contact
	1-80737D33	ASSEMBLY, red wire and lug; includes:
	14-82882A01	BODY, fuseholder
	29-82335A01	TERMINAL; male
	41-82885A01	TERMINAL, fuseholder
	42-82884A01	CLIP, fuseholder

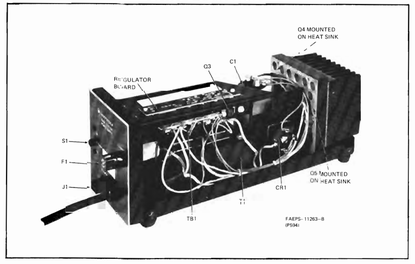
CABLE DETAILS



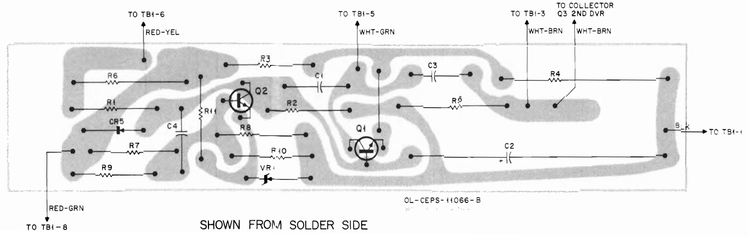




PARTS LOCATION



REGULATOR BOARD DETAIL



SHOWN FROM SOLDER SIDE

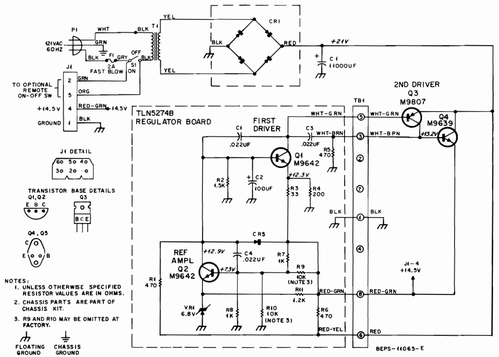
MODEL TABLE

Model	Sub-Model	Description
TPN1136A	TLN5274B	Regulator Board
	TRN6282A	Power Supply Chassis
TKN6948A		Power Cable (*Maxar*)
TKN6949A		Power Cable (*Maxar-80*)
TKN8199A		Power Cable (*MCX100*)

BASE STATION POWER SUPPLY
MODEL TPN1136A
POWER CABLES
MODELS TKN6948A, TKN6949A, AND TKN8199A

FUNCTION

Provides the entire radio with regulated +14.5 V dc when used in a 120 V ac primary power fixed installation.



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parts list

TKN8199A Power Cable Kit — PL-7636-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		fuse:
F1	65-10266	10 amp
	or 65-15270	6 amp
		connector, plug:
P359	15-84192M01	HOUSING, 6-contact
P602	15-10183A52	HOUSING, 6-contact
		mechanical parts
	1-80737D31	assembly power cable; includes:
	14-82883A01	CAP, fuse holder
	42-82884A01	CLIP, fuse
	29-82335A01	TERMINAL, male
	30-84396L02	CABLE, 2-conductor
	37-134370	TUBING, heatshrink, 3/4" (BLK)
	37-134371	TUBING, heatshrink, 3/8" (BLK)
	9-82845L01	CRIMP, connector
	1-80737D32	ASSEMBLY, red wire and lug; includes:
	9-84151B03	RECEPTACLE, single contact
	1-80737D33	ASSEMBLY, red wire and lug; includes:
	14-82882A01	BODY, fuseholder
	29-82335A01	TERMINAL, male
	41-82885A01	TERMINAL, fuseholder
	42-82884A01	CLIP, fuseholder

TKN6948A Power Cable Kit — PL-6084-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		fuse, cartridge:
F602	65-86099	7.5 amp, 32 V, type 3AG; fast-blow
		connector, plug:
P601		includes:
	15-83293K01	INSULATOR, connector; 15-circuit
	29-84706E05	TERMINAL, pin; male; 4 used
	30-10286A21	WIRE, jumper; BLK
P602		includes:
	15-10183A52	INSULATOR, connector; 6-circuit
	29-82335A01	TERMINAL, pin; male; 4 used
		cable, power:
W601	30-84396L01	2-conductor,(18 ga.); 120" used
		fuseholder, in-line:
XF602		includes:
	14-82882A01	BODY, fuseholder
	14-82883A01	CAP, fuseholder
	41-82885A01	SPRING, compression
	42-82884A01	CLIP, fuseholder; 2 used
		non-referenced part
	37-134371	TUBING, heatshrink (BLK) 1" length; 2 used

TKN6949A Power Cable Kit — PL-6085-A

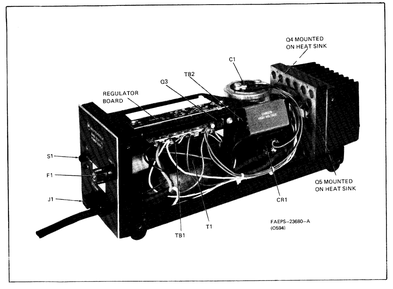
REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		fuse, cartridge: "
F603	65-4165	15 amp, 35 V, fast-blow type
		connector, plug:
P601		includes:
	15-83958L01	INSULATOR, connector; 17-circuit
	29-82335A01	TERMINAL, pin; male; (large) 2 used
	29-84706E05	TERMINAL, pin; male; (small) 6 used
	30-10286A21	WIRE, jumper; BLK
P602		includes:
	15-10183A52	INSULATOR, connector; 6-circuit
	29-82335A01	TERMINAL, pin; male; 4 used
		cable, power;
W601	30-84396L02	2-conductor,(14 ga.); 120" used
		fuseholder, in-line:
XF603		includes:
	14-82882A01	BODY, fuseholder
	14-82883A01	CAP, fuseholder
	41-82885A01	SPRING, compression
	42-82884A01	CLIP, fuseholder; 2 used
		non-referenced part
	37-134371	TUBING, heatshrink (BLK) 1" length; 2 used

TRN6561A Power Supply Chassis — PL-5362-G

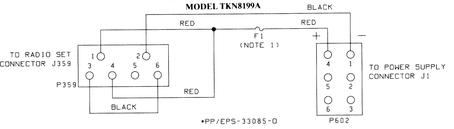
REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed:
C1	23-82464C10	25,000 uF + 75-10%; 40 V
		semiconductor device; diode: (see note)
CR1	48-84571H02	Bridge Rectifier Assembly, silicon
		connector, receptacle:
J1		includes:
		15-10183A53 INSULATOR, 6-contact
		29-82336A01 CONTACT, female, 2 req'd.
		fuse, cartridge:
F1	65-52293	fast-blow type; 5 A
		line cord:
P1	30-83212F01	includes:
		ac plug
		transistor: (see note)
Q3	48-869807	PNP; type M9807
Q4, 5	48-869639	NPN; type M9639
		switch, slide:
S1	40-84241G04	DPST
		resistor, fixed:
R12, 13	17-82177B50	0.1 ± 10%; 7 W
		transformer, power:
T1	25-84638C02	pri: res. 4.9 ohms (240 volt configuration) sec: res. 0.035 ohms
		terminal strip:
TB1	31-121700	8 terminals, No. 2 & 7 mtg.
TB2	31-898341	4 terminals, screw
		fuseholder:
XF1	9-82083C01	extractor post type
		non-referenced items
	37-134371	TUBING, heatshrink: BLK 1" length; 2 used
	1-80794B62	HEAT SINK ASSEMBLY
	1-80745B56	WIRE & LUG ASSEMBLY, includes:
	29-824456	LUG, ring tongue
	1-80794B63	TRANSISTOR & LUG ASSEMBLY; 2 req'd. includes:
	4-474216	WASHER, insulator, 2 req'd.
	14-86585A	INSULATOR, transistor
	29-84489B01	LUG, transistor; 2 req'd. (used with Q4 & Q5)
	2-7005	NUT, hex; 6-32 x 1/4 x 3/32"; 10 req'd.
	3-2977	SCREW, machine; 6-32 x 1 1/8"; 4 req'd.
	4-7569	WASHER, flat; .145 x .312 x .027"; 2 req'd.
	4-7650	WASHER, lock; #6 (split); 2 req'd.
	4-84496C01	WASHER, shoulder; 4 req'd.
	26-84923B06	HEAT SINK
	29-5248	LUG, soldering; #6; 2 req'd.
	31-490181	TERMINAL STRIP; #1 mtg; 2 req'd.
	1-80794B64	DIODE BRACKET ASSEMBLY, includes:
	1-80745B56	WIRE & LUG ASSEMBLY, includes:
	29-824456	LUG, ring tongue
	1-80745B58	WIRE & LUG ASSEMBLY, includes:
	29-824456	LUG, ring tongue
	1-80745B60	WIRE & LUG ASSEMBLY, includes:
	29-824456	LUG, ring tongue
	1-80745B61	WIRE & LUG ASSEMBLY, includes:
	29-824456	LUG, ring
	1-80795B10	WIRE & LUG ASSEMBLY, includes:
	29-812979	LUG, crimp terminal
	2-121841	NUT, hex; 6-32 x 5/16 x 7/64"; 2 req'd.
	3-134168	SCREW, tapping; 4-40 x 1/4"; 2 req'd.
	3-134268	SCREW, tapping; 4-40 x 7/16"; 2 req'd.
	3-138341	SCREW, machine; 6-32 x 5/8"; 2 req'd.
	4-114057	WASHER, flat; .125 x .312 x .032"
	4-821633	WASHER, shoulder
	7-83095F02	BRACKET, circuit board
	14-83275L01	INSULATOR, pnot
	14-84268A01	INSULATOR,transistor
	14-84525G01	INSULATOR, transistor (TO66 Base)
	29-5261	LUG, soldering; 2 req'd.
	29-5369	LUG, soldering

TLN5274B Regulator Board — PL-5361-C

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
	1-80794B65	HOUSING ASSEMBLY,includes:
	15-83296L02	HOUSING COVER
	1-80794B66	CHASSIS ASSEMBLY, includes:
	1-80747B60	WIRE & LUG ASSEMBLY, includes:
	29-82336A03	TERMINAL, female connector
	9-10454A04	WIRE & LUG ASSEMBLY, includes:
	1-80747B61	TERMINAL, female
	29-82336A01	TRANSFORMER & LUG ASSEMBLY, includes:
	29-812979	LUG, crimp terminal
	2-119913	NUT, 8-32 x 11/32"
	2-9627	NUT, hex; 4-40 x 3/16 x 3/32"; 2 req'd.
	3-7312	SCREW, machine; 8-32 x 3/4"
	3-2979	SCREW, machine; 6-32 x 3/8"; 3 req'd.
	3-7346	SCREW, machine; 6-32 x 3/4"
	3-136143	SCREW, tapping; 8-32 x 1/4"; 4 req'd.
	3-139085	SCREW, machine; 4-40 x 5/16"; 2 req'd.
	3-490773	SCREW, machine; 6-32 x 9/16"; 4 req'd.
	4-2645	WASHER, lock; #5 (split); 4 req'd.
	4-7657	WASHER, lock; #6 (split); 4 req'd.
	4-114583	WASHER, lock; #4 (split); 2 req'd.
	4-82418B88	WASHER, insulator
	7-83158L01	BRACKET
	13-84639D05	ESCUTCHEON
	27-83252N01	CHASSIS
	42-82018H01	RETAINER, cable
	75-84215A02	BUMPER, recessed
	3-2979	SCREW, machine; 6-32 x 3/8"; 4 req'd
	3-139854	SCREW, tapping; 6-32 x 3/8"; 8 req'd
	3-134168	SCREW, tapping; 4-40 x 1/4"; 2 req'd
	3-139138	SCREW, tapping; 10-32 x 3/3"; 3 req'd.
	4-2645	WASHER, lock; #6 (split); 4 req'd.
	42-10217A02	STRAP, cable harness; 3 req'd.

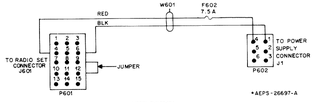


CABLE DETAILS
MODEL TKN8199A

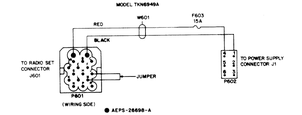


NOTES
1. F1 IS 6A IN 6/10W MODELS. 10A IN 25/30W MODELS.
2. CONNECTORS SHOWN FROM WIRE SIDE.

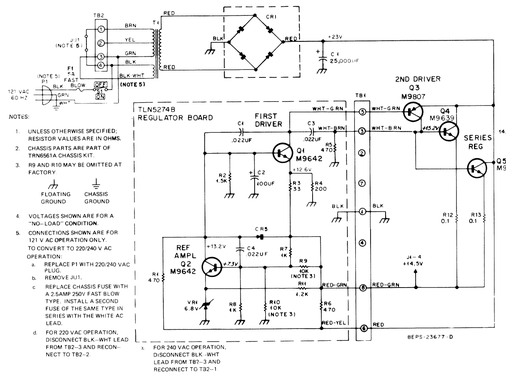
MODEL TKN6948A



MODEL TKN6949A

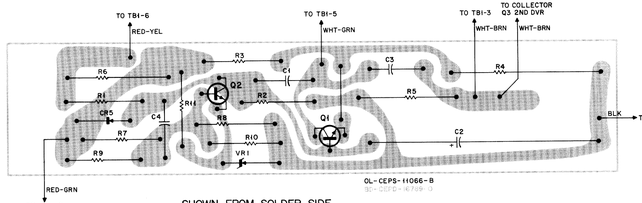


TPN1154A POWER SUPPLY SCHEMATIC DIAGRAM



NOTES:
1. UNLESS OTHERWISE SPECIFIED, RESISTOR VALUES ARE IN OHMS.
2. CHASSIS PARTS ARE PART OF TRN6561A SET.
3. R9 AND R10 MAY BE OMITTED AT FACTORY.
4. VOLTAGES SHOWN ARE FOR A "NO-LOAD" CONDITION.
5. CONNECTIONS SHOWN ARE FOR 121 V AC OPERATION ONLY. TO CONVERT TO 220/240 V AC OPERATION:
   a. REPLACE F1 WITH 220/240 VAC FUSE.
   b. REMOVE JU1.
   c. REPLACE CHASSIS FUSE WITH A 2.5AMP 250V FAST BLOW TYPE. INSTALL A SECOND FUSE OF THE SAME TYPE IN SERIES WITH THE WHITE AC LEAD.
   d. FOR 220 VAC OPERATION, DISCONNECT BLK-WHT LEAD FROM TB2-3 AND RECONNECT TO TB2-2.
6. FOR 240 VAC OPERATION, DISCONNECT BLK-WHT LEAD FROM TB2-3 AND RECONNECT TO TB2-1

TLN5274B REGULATOR CIRCUIT BOARD DETAIL



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BASE STATION POWER SUPPLY
MODEL TPN1154A
POWER CABLE
MODELS TKN6948A, TKN6949A AND TKN8199A

FUNCTION

Provides the entire radio with regulated +14.5 V dc when used in a 121 V ac primary power fixed installation.

MODEL TABLE

MODEL	SUB-MODEL	DESCRIPTION
TPN1154A	TLN5274B	REGULATOR BOARD
	TRN6561A	POWER SUPPLY CHASSIS
TKN6949A		POWER CABLE (*MAXAR* 80)
TKN8199A		POWER CABLE (*MCX100* or *DVP MCX100*)
TKN6948A		POWER CABLE (*MAXAR*)

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