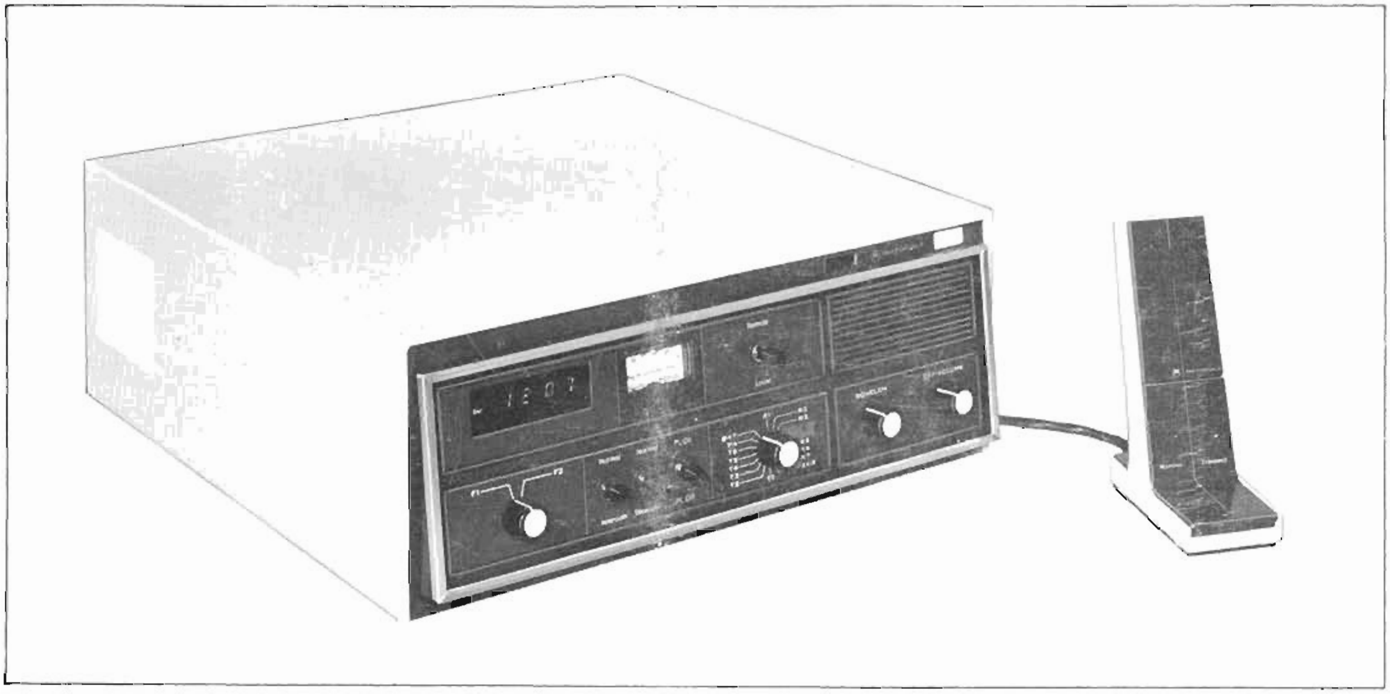
MOTOROLA

installation page 3 station data section

MITREK™ "SUPER CONSOLETTE" Base Station



This Manual Must Be Used With Applicable Radio Set Manual:

29.7-50 MHz	68P81037E65
136-174 MHz	68P81037E70
403-420 & 450-512 MHz	68P81037E75

68P81040E80-A

MOTOROLA INC.
Communications
Group

MITREK
"SUPER CONSOLETTE"
BASE STATION

CONTENTS

STATION DATA

STATION EQUIPMENT

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

68P81040E80-A
2-24-84 GGI

Section *Number*

MISCELLANEOUS EQUIPMENT

PERFORMANCE SPECIFICATIONS

GENERAL

Model Series	Frequency Range (MHz)	Minimum RF Output Power (Watts)	Maximum P.A. Input Power (Watts)	Supply Voltage	AC Current Drain @121 V; 60 Hz Standby	AC Current Drain @121 V; 60 Hz Transmit	DC Current Drain @13.6 V Standby	DC Current Drain @13.6 V Transmit
L51JJB	29.7—50	60	120	120 V ac @ 60 Hz	.4A	3.5A	1A	15A
L71JJB	29.7—50	110	—	(120/220/240 V ac	.4A	6.0A	1A	25A
L43JJB	136—174	40	90	50/60 Hz Opt.)	.4A	3.0A	1A	13A
L53JJB	136—174	60	120	(12 V dc Opt.)	.4A	3.5A	1A	15A
L73JJB	146—174	110	—		.4A	6.5A	1A	28A
L44JJB	403—420 450—512	30	87.5		.4A	3.0A	1A	13A
L54JJB	403—421 450—512	50	137		.4A	4.5A	1A	19A

NO. OF FREQUENCIES:	Local Control: Single, dual, and multifrequency (up-to-four transmit and receive) models. Local/Remote and Remote: Single and dual frequency (up-to-two transmit and receive models).
SQUELCH OPTIONS:	Carrier squelch, **Private-Line** coded squelch, or **Digital Private-Line** coded squelch.
DIMENSIONS:	6-7/8" high x 16-3/4" wide x 21" long. (175 x 425 x 533 mm)
WEIGHT	Approximately 45 lbs. (20.5 kg.) Shipping weight, including accessories: approx. 49 lbs. (22.5 kg.)
METERING:	Optional panel-mounted meter and switch, or single-scale 0-50 micorampere meter with selector switch, can be used to measure all circuits essential to tuning and checking.

RECEIVER

CHANNEL SPACING:	Low Band	VHF	UHF
	20 kHz	30 kHz	25 kHz

INPUT IMPEDANCE:	50 ohms
EIA MODULATION ACCEPTANCE:	± 7 kHz minimum VHF & UHF; 6.5 kHz LOW BAND
FREQUENCY STABILITY:	Channel element maintains oscillator stability within ± .0005% (5 ppm) from -30°C to +60°C ambient (+25°C reference), low band ± .002% (20 ppm)

RECEIVER PROFILE:	UHF		VHF		LB
CHANNEL SPACING:	25 kHz		30 kHz		20 kHz
SENSITIVITY:	With Pre-Amp	Without Pre-Amp	With Pre-Amp	Without Pre-Amp	
20 dB Quieting	0.25 uV	0.50 uV	0.25 uV	0.50 uV	.30 uV
EIA SINAD	0.20 uV	0.75 uV	0.20 uV	0.35 uV	.25 uV
Selectivity EIA SINAD	90 dB	90 dB	95 dB	95 dB	95 dB
Intermodulation EIA SINAD	80 dB	85 dB	80 dB	85 dB	85 dB
Spurious & Image Rejection	100 dB (minimum)	100 dB (minimum)	100 dB (minimum)	100 dB (minimum)	100 dB (mimimum)

SQUELCH SENSITIVITY:	Carrier squelch (at threshold setting), Tone-Coded Squelch (fixed), Digital-Coded Squelch (fixed), are all 6 dBq in all bands.
FREQUENCY SEPARATION:	Low Band: 750 kHz—1.0 MHz VHF: 2.0 MHz UHF: 2.0 MHz*
AUDIO CHARACTERISTICS:	Telephone Line: Output: +11 dBm at 600 ohms Response: +1, -3 dB Distortion: 3% at 1000 Hz Hum & Noise: -50 dB For Local Speaker: Output Available: 6 W at 3.2 ohms Response: +2, -8 dB Distortion: 5% at 1000 Hz Hum & Noise: -55 dB

* 1/2 I-F spur rejection degrades to 90 dB from 1 MHz to 2 MHz frequency separation.

PERFORMANCE SPECIFICATIONS (Cont'd.)

TRANSMITTER

RF POWER OUTPUT:	110 W (29.7-50 & 146-174 MHz) 60 W (29.7-50 & 136-174 MHz) 50 W (403-420 & 450-512 MHz) 40 W (136-174 MHz) 30 W (403-420 & 450-512 MHz)
OUTPUT IMPEDANCE:	50 ohms
SPURIOUS AND HARMONIC EMISSIONS:	More than 85 dB below carrier (per EIA spec., RS-152B par. 4)
FREQUENCY STABILITY:	± .002% (25-50 MHz), ± .0005% (136-174 MHz), ± .0002% (403-512 MHz) of assigned center frequency from -30°C to +60°C ambient (+25°C reference)
MAXIMUM FREQUENCY SEPARATION:	29.7-39 MHz .75 MHz; 39-50 MHz 1.0 MHz; 136-174 MHz 3.0 MHz; 403-420 MHz 450-512 MHz 9.0 MHz
MODULATION:	15F2, 16F3 and 16F9 ± 5 kHz for 100% @1000 Hz
AUDIO SENSITIVITY:	0.100 V ± 3.2 dB for 3 kHz max. deviation at 1000 Hz.
FM NOISE:	55 dB below ± 3.0 kHz deviation @1000 Hz
AUDIO RESPONSE:	+1, -3 dB of 6 dB/octave pre-emphasis characteristic from 300 to 3000 Hz
AUDIO DISTORTION:	Less than 3% @1000 Hz; ± 3.0 kHz deviation

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

Motorola guarantees that this equipment at the time of proper installation, will meet or exceed the performance specifications listed above.

FCC DESIGNATIONS

Transmitter

Transmitter Power Output	Frequency	Frequency Stability	FCC Acceptance Number
110 W	29.7-50 MHz	±0.002%	CC1170
60 W	29.7-50 MHz	±0.002%	CC1159
110 W	146-174 MHz	±0.0005%	CC3358
60 W	150-174 MHz	±0.0005%	CC3347
40 W	150-174 MHz	±0.0005%	CC3346
50 W	450-512 MHz	±0.0002%	CC4310C
30 W	450-512 MHz	±0.0002%	CC4309C
30 W	450-512 MHz	±0.0005%	CC4309

Receiver (for AC & DC Operation)

Frequency	FCC Acceptance Number
29.7-50 MHz with Extender	RC0214
29.7-50 MHz without Extender	RC0213
150-174 MHz with Pre-Amp	RC0216
150-174 MHz without Pre-Amp	RC0215
450-512 MHz with Pre-Amp	RC0218
450-512 MHz without Pre-Amp	RC0217

(Pages v and vi have been omitted due to non-relevancy)

MODEL CHART
FOR
29.7-50 MHz, 60 W RF POWER
"MITREK" SUPER "CONSOLETTE" BASE STATION
RADIO SET

ITEM	DESCRIPTION
HUB1003B	UNIFIED CHASSIS (29.7-38.999 MHz); NON-EXTENDER
HUB1004B	UNIFIED CHASSIS (39-50 MHz); NON-EXTENDER
HUB1023B	UNIFIED CHASSIS (29.7-38.999 MHz); w/EXTENDER
HUB1024B	UNIFIED CHASSIS (39-50 MHz); w/EXTENDER
KXN1085A	RECEIVER CHANNEL ELEMENT
KXN1087A	TRANSMITTER CHANNEL ELEMENT
KLN6209A	"VIBRASPONDER" RESONANT REED
HLN4135A	CONTROL PANEL AND CHASSIS (LOCAL CONTROL)
HLN4136A	CONTROL PANEL AND CHASSIS (REMOTE CONTROL)
HLN4144A	MISCELLANEOUS HARDWARE (LOCAL CONTROL)
HLN4133A	MISCELLANEOUS HARDWARE (REMOTE CONTROL)
HPN1001A	POWER SUPPLY
TLN4415A	EXTENDER SWITCH KIT
TRN6153A	MULTI-FREQUENCY SWITCH KIT
HLN4020B	"PRIVATE-LINE" TONE ENCODER/DECODER BOARD
HLN4011A	"DIGITAL PRIVATE-LINE" ENCODER/DECODER BOARD
HLN4132A	INTERFACE BOARD
TRN6154A	PANEL AND HARDWARE KIT
TRN6005A	CODE PLUG
HHN4006A	RADIO HOUSING
TMN1004B	DESK MICROPHONE, CARRIER SQUELCH
TMN1005B	DESK MICROPHONE, "PRIVATE-LINE"
TCN1217A	TONE REMOTE CONTROL KIT, 1-FREQ.; CARRIER SQUELCH
TCN1218A	TONE REMOTE CONTROL KIT, 1-FREQ.; "PRIVATE-LINE"
TCN1219A	TONE REMOTE CONTROL KIT, 2-FREQ.; "PRIVATE-LINE"
HLN4023A	TUNING TOOL

CODE:

- ● = ONE ITEM SUPPLIED
- 4 = NUMBER INDICATES QUANTITY SUPPLIED
- / = ONE ITEM SUPPLIED DEPENDENT UPON FREQUENCY RANGE

STATION MODEL VARIABLES

L51JJB1100BM

- M = MIC INCLUDED
- 0 = LOCAL CONTROL; 6 = TONE REMOTE CONTROL
- 0 = T1-R1; 3 = T2-R2; 9 = T4-R4
- 1 = WITHOUT EXTENDER; 4 = WITH EXTENDER
- 1 = CARRIER SQUELCH; 3 = "PRIVATE-LINE" TONE CODED SQUELCH; 6 = "DIGITAL PRIVATE-LINE" CODED SQUELCH
- 4 = 30-WATT RF POWER OUTPUT; 5 = 50-WATT RF POWER OUTPUT

MODEL NUMBER	HUB1003B	HUB1004B	HUB1023B	HUB1024B	KXN1085A	KXN1087A	KLN6209A	HLN4135A	HLN4136A	HLN4144A	HLN4133A	HPN1001A	TLN4415A	TRN6153A	HLN4020B	HLN4011A	HLN4132A	TRN6154A	TRN6005A	HHN4006A	TMN1004B	TMN1005B	TCN1217A	TCN1218A	TCN1219A	HLN4023A	NUMBER OF OPERATING FREQ.	TYPE OF CONTROL	EXTENDER OPERATION
CARRIER SQUELCH MODELS																													
L51JJB1100BM	/	/			●	●		●		●		●					●			●	●					●	1	LOCAL	NO
L51JJB1400BM			/	/	●	●		●		●		●	●				●			●	●					●	1	LOCAL	YES
L51JJB1130BM	/	/			2	2		●		●		●		●			●			●	●					●	2	LOCAL	NO
L51JJB1430BM			/	/	2	2		●		●		●	●	●			●			●	●					●	2	LOCAL	YES
L51JJB1190BM	/	/			4	4		●		●		●		●			●			●	●					●	4	LOCAL	NO
L51JJB1490BM			/	/	4	4		●		●		●	●	●			●			●	●					●	4	LOCAL	YES
L51JJB1106B	/	/			●	●			●		●	●					●			●			●			●	1	TONE REMOTE	NO
L51JJB1406B			/	/	●	●			●		●	●	●				●			●			●			●	1	TONE REMOTE	YES
L51JJB1136B	/	/			2	2			●		●	●					●			●					●	●	2	TONE REMOTE	NO
L51JJB1436B			/	/	2	2			●		●	●	●				●			●					●	●	2	TONE REMOTE	YES
"PRIVATE-LINE" MODELS																													
L51JJB3100BM	/	/			●	●	2	●		●		●			●		●	●		●		●				●	1	LOCAL	NO
L51JJB3400BM			/	/	●	●	2	●		●		●	●		●		●	●		●		●				●	1	LOCAL	YES
L51JJB3130BM	/	/			2	2	2	●		●		●		●	●		●	●		●		●				●	2	LOCAL	NO
L51JJB3430BM			/	/	2	2	2	●		●		●	●	●	●		●	●		●		●				●	2	LOCAL	YES
L51JJB3190BM	/	/			4	4	2	●		●		●		●	●					●		●				●	4	LOCAL	NO
L51JJB3490BM			/	/	4	4	2	●		●		●	●	●	●		●	●		●		●				●	4	LOCAL	YES
L51JJB3106B	/	/			●	●	2		●		●	●			●		●			●				●		●	1	TONE REMOTE	NO
L51JJB3406B			/	/	●	●	2		●		●	●	●		●		●			●				●		●	1	TONE REMOTE	YES
L51JJB3136B	/	/			2	2	2		●		●	●			●		●			●					●	●	2	TONE REMOTE	NO
L51JJB3436B			/	/	2	2	2		●		●	●	●		●		●			●					●	●	2	TONE REMOTE	YES
"DIGITAL PRIVATE-LINE" MODELS																													
L51JJB6100BM	/	/			●	●		●		●		●				●	●	●	●	●		●				●	1	LOCAL	NO
L51JJB6400BM			/	/	●	●		●		●		●	●			●	●	●	●	●		●				●	1	LOCAL	YES
L51JJB6130BM	/	/			2	2		●		●		●		●		●	●	●	●	●		●				●	2	LOCAL	NO
L51JJB6430BM			/	/	2	2		●		●		●	●	●		●	●	●	●	●		●				●	2	LOCAL	YES
L51JJB6190BM	/	/			4	4		●		●		●		●		●	●	●	●	●		●				●	4	LOCAL	NO
L51JJB6490BM			/	/	4	4		●		●		●	●	●		●	●	●	●	●		●				●	4	LOCAL	YES
L51JJB6106B	/	/			●	●			●		●	●				●	●		●	●				●		●	1	TONE REMOTE	NO
L51JJB6406B			/	/	●	●			●		●	●	●			●	●		●	●				●		●	1	TONE REMOTE	YES
L51JJB6136B	/	/			2	2			●		●	●				●	●		●	●					●	●	2	TONE REMOTE	NO
L51JJB6436B			/	/	2	2			●		●	●	●			●	●		●	●					●	●	2	TONE REMOTE	YES

EPS-30832-A

MODEL CHART
FOR
29.7-50 MHz, 110 W RF POWER
"MITREK" SUPER "CONSOLETTE" BASE STATION
RADIO SET

CODE:

- ● = ONE ITEM SUPPLIED
- 4 = NUMBER INDICATES QUANTITY SUPPLIED
- / = ONE ITEM SUPPLIED DEPENDENT UPON FREQUENCY RANGE

STATION MODEL VARIABLES

NOTE
STATION MODELS ARE NOT AVAILABLE FOR ALL POSSIBLE LETTER AND NUMBER COMBINATIONS.

L 7 1 J J B 1 1 0 0 B M

- M = MIC INCLUDED
- 0 = LOCAL CONTROL
- 6 = TONE REMOTE CONTROL
- 0 = T1-R1
- 3 = T2-R2
- 9 = T4-R4
- 1 = WITHOUT EXTENDER
- 4 = WITH EXTENDER
- 1 = CARRIER SQUELCH
- 3 = "PRIVATE-LINE" TONE CODED SQUELCH
- 6 = "DIGITAL PRIVATE-LINE" CODED SQUELCH

ITEM	DESCRIPTION
HUB1013B	TRANSMITTER-RECEIVER UNIT (29.7-38.999 MHz
HUB1014B	TRANSMITTER-RECEIVER UNIT (39-50 MHz)
HUB1033B	TRANSMITTER-RECEIVER UNIT WITH EXTENDER (29.7-38.999 MHz)
HUB1034B	TRANSMITTER-RECEIVER UNIT WITH EXTENDER (39-50 MHz)
HPN1003A	POWER SUPPLY
HLN4135A	CONTROL PANEL & CHASSIS, LOCAL CONTROL
HLN4136A	CONTROL PANEL & CHASSIS, REMOTE CONTROL
HLN4147A	HARDWARE, LOCAL CONTROL HI-POWER
HLN4148A	HARDWARE, REMOTE CONTROL HI-POWER
HLN4132A	INTERFACE BOARD
HHN4006A	HOUSING
KXN1087A	TRANSMITTER CHANNEL ELEMENT
KXN1085A	RECEIVER CHANNEL ELEMENT
TRN6153A	MULTI-FREQUENCY SWITCH KIT
HLN4020B	"PRIVATE-LINE" TONE ENCODER/DECODER BOARD
KLN6209A	"VIBRASPONDER" RESONANT REED
HLN4011A	"PRIVATE-LINE" DIGITAL ENCODER DECODER BOARD
TRN6005A	"PRIVATE-LINE" DIGITAL CODE PLUG
TRN6154A	"PRIVATE-LINE" SWITCH KIT
TMN1004B	DESK MICROPHONE, CARRIER SQUELCH
TMN1005B	DESK MICROPHONE, "PRIVATE-LINE"
HLN4023A	TUNING TOOL
TCN1217A	TONE REMOTE CONTROL KIT, 1-FREQ.; CARRIER SQUELCH
TCN1218A	TONE REMOTE CONTROL KIT, 1-FREQ.; "PRIVATE-LINE"
TCN1219A	TONE REMOTE CONTROL KIT, 2-FREQ.; "PRIVATE-LINE" & CARRIER SQUELCH
TLN4415A	"EXTENDER" SWITCH KIT

MODEL NUMBER	NUMBER OF OPERATING FREQ.	TYPE OF CONTROL	EXTENDER OPERATION	HUB1013B	HUB1014B	HUB1033B	HUB1034B	HPN1003A	HLN4135A	HLN4136A	HLN4147A	HLN4148A	HLN4132A	HHN4006A	KXN1087A	KXN1085A	TRN6153A	HLN4020B	KLN6209A	HLN4011A	TRN6005A	TRN6154A	TMN1004B	TMN1005B	HLN4023A	TCN1217A	TCN1218A	TCN1219A	TLN4415A
CARRIER SQUELCH MODELS																													
L71JJB1100BM	1	LOCAL	NO	/	/			●	●		●		●	●	●	●							●		●				
L71JJB1400BM	1	LOCAL	YES			/	/	●	●		●		●	●	●	●							●		●				●
L71JJB1130BM	2	LOCAL	NO	/	/			●	●		●		●	●	2	2	●						●		●				
L71JJB1430BM	2	LOCAL	YES			/	/	●	●		●		●	●	2	2	●						●		●				●
L71JJB1190BM	4	LOCAL	NO	/	/			●	●		●		●	●	4	4	●						●		●				
L71JJB1490BM	4	LOCAL	YES			/	/	●	●		●		●	●	4	4	●						●		●				●
L71JJB1106B	1	TONE REMOTE	NO	/	/			●		●		●	●	●	●	●									●	●			
L71JJB1406B	1	TONE REMOTE	YES			/	/	●		●		●	●	●	●	●									●	●			●
L71JJB1136B	2	TONE REMOTE	NO	/	/			●		●		●	●	●	2	2									●			●	
L71JJB1436B	2	TONE REMOTE	YES			/	/	●		●		●	●	●	2	2									●			●	●
"PRIVATE-LINE" MODELS																													
L71JJB3100BM	1	LOCAL	NO	/	/			●	●				●	●	●	●		●	2			●		●	●				
L71JJB3400BM	1	LOCAL	YES			/	/	●	●		●		●	●	●	●		●	2			●		●	●				●
L71JJB3130BM	2	LOCAL	NO	/	/			●	●		●		●	●	2	2	●	●	2			●		●	●				
L71JJB3430BM	2	LOCAL	YES			/	/	●	●		●		●	●	2	2	●	●	2			●		●	●				●
L71JJB3190BM	4	LOCAL	NO	/	/			●	●		●		●	●	4	4	●	●	2			●		●	●				
L71JJB3490BM	4	LOCAL	YES			/	/	●	●		●		●	●	4	4	●	●	2			●		●	●				●
L71JJB3106B	1	TONE REMOTE	NO	/	/			●		●		●	●	●	●	●		●	2						●		●		
L71JJB3406B	1	TONE REMOTE	YES			/	/	●		●		●	●	●	●	●		●	2						●		●		●
L71JJB3136B	2	TONE REMOTE	NO	/	/			●		●		●	●	●	2	2		●	2						●			●	
L71JJB3436B	2	TONE REMOTE	YES			/	/	●		●		●	●	●	2	2		●	2						●			●	●
"DIGITAL PRIVATE-LINE" MODELS																													
L71JJB6100BM	1	LOCAL	NO	/	/			●	●		●		●	●	●	●				●	●	●		●	●				
L71JJB6400BM	1	LOCAL	YES			/	/	●	●		●		●	●	●	●				●	●	●		●	●				●
L71JJB6130BM	2	LOCAL	NO	/	/			●	●		●		●	●	2	2	●			●	●	●		●	●				
L71JJB6430BM	2	LOCAL	YES			/	/	●	●		●		●	●	2	2	●			●	●	●		●	●				●
L71JJB6190BM	4	LOCAL	NO	/	/			●	●		●		●	●	4	4	●			●	●	●		●	●				
L71JJN6490BM	4	LOCAL	YES			/	/	●	●		●		●	●	4	4	●			●	●	●		●	●				●
L71JJB6106B	1	TONE REMOTE	NO	/	/			●		●		●	●	●	●	●				●	●				●		●		
L71JJB6406B	1	TONE REMOTE	YES			/	/	●		●		●	●	●	●	●				●	●				●		●		●
L71JJB6136B	2	TONE REMOTE	NO	/	/			●		●		●	●	●	2	2				●	●				●			●	
L71JJB6436B	2	TONE REMOTE	YES			/	/	●		●		●	●	●	2	2				●	●				●			●	●

EPS-30833-A

MODEL CHART FOR 136-174 MHz, 40 W RF POWER 136-174 MHz, 60 W RF POWER "MITREK" SUPER "CONSOLETTE" BASE STATION RADIO SET

CODE:

- ● = ONE ITEM SUPPLIED
- 4 = NUMBER INDICATES QUANTITY SUPPLIED
- / = ONE ITEM SUPPLIED DEPENDENT UPON FREQUENCY RANGE

STATION MODEL VARIABLES

NOTE
STATION MODELS ARE NOT AVAILABLE FOR ALL POSSIBLE LETTER AND NUMBER COMBINATIONS

L 4 3 J J B 1 1 0 0 B M

- M = MIC INCLUDED
- 0 = LOCAL CONTROL
- 6 = TONE REMOTE CONTROL
- 0 = T1-R1
- 3 = T2-R2
- 9 = T4-R4
- 1 = CARRIER SQUELCH
- 3 = "PRIVATE-LINE" TONE CODED SQUELCH
- 6 = "DIGITAL PRIVATE-LINE" CODED SQUELCH
- 4 = 40-WATT RF POWER OUTPUT
- 5 = 60-WATT RF POWER OUTPUT

ITEM	DESCRIPTION
HUD1003B	UNIFIED CHASSIS (136-150.8 MHz); 40-WATT
HUD1004B	UNIFIED CHASSIS (146-174 MHz); 40-WATT
HUD1013B	UNIFIED CHASSIS (136-150.8 MHz); 60-WATT
HUD1014B	UNIFIED CHASSIS (146-174 MHz); 60-WATT
KXN1086B	RECEIVER CHANNEL ELEMENT
KXN1088A	TRANSMITTER CHANNEL ELEMENT
KLN6209A	"VIBRASPONDER" RESONANT REED
HLN4135A	CONTROL PANEL AND CHASSIS (LOCAL CONTROL)
HLN4136A	CONTROL PANEL AND CHASSIS (REMOTE CONTROL)
HLN4144A	MISCELLANEOUS HARDWARE
HLN4133A	MISCELLANEOUS HARDWARE
HPN1001A	POWER SUPPLY
TRN6153A	MULTI-FREQUENCY SWITCH KIT
HLN4020B	"PRIVATE-LINE" TONE ENCODER/DECODER BOARD
HLN4011A	"DIGITAL PRIVATE-LINE" ENCODER/DECODER BOARD
TRN6005A	CODE PLUG
HLN4132A	INTERFACE BOARD
TRN6154A	PANEL AND HARDWARE KIT
HHN4006A	RADIO HOUSING
TMN1004B	DESK MICROPHONE, CARRIER SQUELCH
TMN1005B	DESK MICROPHONE, "PRIVATE-LINE"
TCN1217A	TONE REMOTE CONTROL KIT, 1-FREQ.; CARRIER SQUELCH
TCN1218A	TONE REMOTE CONTROL KIT, 1-FREQ.; "PRIVATE-LINE"
TCN1219A	TONE REMOTE CONTROL KIT, 2-FREQ.; "PRIVATE-LINE"
HLN4023A	TUNING TOOL

MODEL NUMBER	NUMBER OF OPERATING FREQ.	TYPE OF CONTROL	TRANSMITTER POWER OUTPUT	HUD1003B	HUD1004B	HUD1013B	HUD1014B	KXN1086B	KXN1088A	KLN6209A	HLN4135A	HLN4136A	HLN4144A	HLN4133A	HPN1001A	TRN6153A	HLN4020B	HLN4011A	TRN6005A	HLN4132A	TRN6154A	HHN4006A	TMN1004B	TMN1005B	TCN1217A	TCN1218A	TCN1219A	HLN4023A
CARRIER SQUELCH MODELS																												
L43JJB1100BM	1	LOCAL	40 W					●	●		●		●		●					●		●	●					●
L53JJB1100BM	1	LOCAL	60 W					●	●		●		●		●					●		●	●					●
L43JJB1130BM	2	LOCAL	40 W					2	2		●		●		●	●				●		●	●					●
L53JJB1130BM	2	LOCAL	60 W					2	2		●		●		●	●				●		●	●					●
L43JJB1190BM	4	LOCAL	40 W					4	4		●		●		●	●				●		●	●					●
L53JJB1190BM	4	LOCAL	60 W					4	4		●		●		●	●				●		●	●					●
L43JJB1106B	1	TONE REMOTE	40 W					●	●			●		●	●					●		●			●			●
L53JJB1106B	1	TONE REMOTE	60 W					●	●			●		●	●					●		●			●			●
L43JJB1136B	2	TONE REMOTE	40 W					2	2			●		●	●					●		●					●	●
L53JJB1136B	2	TONE REMOTE	60 W					2	2			●		●	●					●		●					●	●
"PRIVATE-LINE" MODELS																												
L43JJB3100BM	1	LOCAL	40 W	/	/			●	●	2	●		●		●		●			●	●	●		●				●
L53JJB3100BM	1	LOCAL	60 W			/	/	●	●	2	●		●		●		●			●	●	●		●				●
L43JJB3130BM	2	LOCAL	40 W	/	/			2	2	2	●		●		●	●	●			●	●	●		●				●
L53JJB3130BM	2	LOCAL	60 W			/	/	2	2	2	●		●		●	●	●			●	●	●		●				●
L43JJB3190BM	4	LOCAL	40 W	/	/			4	4	2	●		●		●	●	●			●	●	●		●				●
L53JJB3190BM	4	LOCAL	60 W			/	/	4	4	2	●		●		●	●	●			●	●	●		●				●
L43JJB3106B	1	TONE REMOTE	40 W	/	/			●	●	2		●		●	●		●			●		●				●		●
L53JJB3106B	1	TONE REMOTE	60 W			/	/	●	●	2		●		●	●		●			●		●				●		●
L43JJB3136B	2	TONE REMOTE	40 W	/	/			2	2	2		●		●	●		●			●		●					●	●
L53JJB3136B	2	TONE REMOTE	60 W			/	/	2	2	2		●		●	●		●			●		●					●	●
"DIGITAL PRIVATE-LINE" MODELS																												
L43JJB6100BM	1	LOCAL	40 W	/	/			●	●		●		●		●			●	●	●	●	●		●				●
L53JJB6100BM	1	LOCAL	60 W			/	/	●	●		●		●		●			●	●	●	●	●		●				●
L43JJB6130BM	2	LOCAL	40 W	/	/			2	2		●		●		●	●		●	●	●	●	●		●				●
L53JJB6130BM	2	LOCAL	60 W			/	/	2	2		●		●		●	●		●	●	●	●	●		●				●
L43JJB6190BM	4	LOCAL	40 W	/	/			4	4		●		●		●	●		●	●	●	●	●		●				●
L53JJB6190BM	4	LOCAL	60 W			/	/	4	4		●		●		●	●		●	●	●	●	●		●				●
L43JJB6106B	1	TONE REMOTE	40 W	/	/			●	●			●		●	●			●	●	●		●				●		●
L53JJB6106B	1	TONE REMOTE	60 W			/	/	●	●			●		●	●			●	●	●		●				●		●
L43JJB6136B	2	TONE REMOTE	40 W	/	/			2	2			●		●	●			●	●	●		●					●	●
L53JJB6136B	2	TONE REMOTE	60 W			/	/	2	2			●		●	●			●	●	●		●					●	●

EPS-30834-A

MODEL CHART FOR 146-174 MHz, 110 W RF POWER "MITREK" SUPER "CONSOLETTE" BASE STATION RADIO SET

CODE:

- ● = ONE ITEM SUPPLIED
- 4 = NUMBER INDICATES QUANTITY SUPPLIED
- / = ONE ITEM SUPPLIED DEPENDENT UPON FREQUENCY RANGE

STATION MODEL VARIABLES

NOTE
STATION MODELS ARE NOT AVAILABLE FOR ALL POSSIBLE LETTERS AND NUMBER COMBINATIONS.

L 7 1 J J B 1 1 0 0 B M

- M = MIC INCLUDED
- 0 = LOCAL CONTROL
- 6 = TONE REMOTE CONTROL
- 0 = T1-R1
- 3 = T2-R2
- 9 = T4-R4
- 1 = WITHOUT EXTENDER
- 4 = WITH EXTENDER
- 1 = CARRIER SQUELCH
- 3 = "PRIVATE-LINE" TONE CODED SQUELCH
- 6 = "DIGITAL PRIVATE-LINE" CODED SQUELCH

ITEM	DESCRIPTION
HUD1034B	TRANSMITTER-RECEIVER UNIT (146-174 MHz)
HPN1003A	POWER SUPPLY
HLN4135A	CONTROL PANEL & CHASSIS, LOCAL CONTROL
HLN4136A	CONTROL PANEL & CHASSIS, REMOTE CONTROL
HLN4147A	HARDWARE, LOCAL CONTROL HI-POWER
HLN4148A	HARDWARE, REMOTE CONTROL HI-POWER
HLN4132A	INTERFACE BOARD
HHN4006A	HOUSING
KXN1087A	TRANSMITTER CHANNEL ELEMENT
KXN1086B	RECEIVER CHANNEL ELEMENT
TRN6135A	MULTI-FREQ. SWITCH
HLN4020B	"PRIVATE-LINE" TONE ENCODER/DECODER BOARD
KLN6209A	"VIBRASPONDER" RESONANT REED
HLN4011A	"DIGITAL PRIVATE-LINE" ENCODER/DECODER BOARD
TRN6005A	"DIGITAL PRIVATE-LINE" CODE PLUG
TRN6154A	"PRIVATE-LINE" SWITCH KIT
TMN1004B	DESK MICROPHONE, CARRIER SQUELCH
TMN1005B	DESK MICROPHONE, "PRIVATE-LINE"
HLN4023A	TUNING TOOL
TCN1217A	TONE REMOTE CONTROL, 1-FREQ.; CARRIER SQUELCH
TCN1218A	TONE REMOTE CONTROL, 1-FREQ.; "PRIVATE-LINE"
TCN1219A	TONE REMOTE CONTROL, 2-FREQ.; "PRIVATE-LINE"

MODEL NUMBER	NUMBER OF OPERATING FREQ.	TYPE OF CONTROL	HUD1034B	HPN1003A	HLN4135A	HLN4136A	HLN4147A	HLN4148A	HLN4132A	HHN4006A	KXN1087A	KXN1086B	TRN6135A	HLN4020B	KLN6209A	HLN4011A	TRN6005A	TRN6154A	TMN1004B	TMN1005B	HLN4023A	TCN1217A	TCN1218A	TCN1219A
CARRIER SQUELCH MODELS																								
L73JJB1100BM	1	LOCAL	/	●	●		●		●	●	●	●							●		●			
L73JJB1130BM	2	LOCAL	/	●	●		●		●	●	2	2	●						●		●			
L73JJB1190BM	4	LOCAL	/	●	●		●		●	●	4	4	●						●		●			
L73JJB1106B	1	TONE REMOTE	/	●		●		●	●	●	●	●									●	●		
L73JJB1136B	2	TONE REMOTE	/	●		●		●	●	●	2	2									●			●
"PRIVATE-LINE" MODELS																								
L73JJB3100BM	1	LOCAL	/	●	●		●		●	●	●	●		●	2			●		●	●			
L73JJB3130BM	2	LOCAL	/	●	●		●		●	●	2	2	●	●	2			●		●	●			
L73JJB3190BM	4	LOCAL	/	●	●		●		●	●	4	4	●	●	2			●		●	●			
L73JJB3106B	1	TONE REMOTE	/	●		●		●	●	●	●	●		●	2						●		●	
L73JJB3136B	2	TONE REMOTE	/	●		●		●	●	●	2	2		●	2						●			●
"DIGITAL PRIVATE-LINE" MODELS																								
L73JJB6100BM	1	LOCAL	/	●	●		●		●	●	●	●				●	●	●		●	●			
L73JJB6130BM	2	LOCAL	/	●	●		●		●	●	2	2	●			●	●	●		●	●			
L73JJB6190BM	4	LOCAL	/	●	●		●		●	●	4	4	●			●	●	●		●	●			
L73JJB6106B	1	TONE REMOTE	/	●		●		●	●	●	●	●				●	●				●		●	
L73JJB6136B	2	TONE REMOTE	/	●		●		●	●	●	2	2				●	●				●			●

EPS-30835-A

MODEL CHART FOR EARLIER VERSION 29.7-50 MHz, 110 W RF POWER "MITREK" SUPER "CONSOLETTE" BASE STATION RADIO SET

CODE:

- ● = ONE ITEM SUPPLIED
- 4 = NUMBER INDICATES QUANTITY SUPPLIED
- / = ONE ITEM SUPPLIED DEPENDENT UPON FREQUENCY RANGE

STATION MODEL VARIABLES

NOTE
STATION MODELS ARE NOT AVAILABLE FOR ALL POSSIBLE LETTER AND NUMBER COMBINATIONS.

L 7 1 J J B 1 1 0 0 A M

- M = MIC INCLUDED
- 0 = LOCAL CONTROL; 6 = TONE REMOTE CONTROL
- 0 = T1-R1; 3 = T2-R2; 9 = T4-R4
- 1 = WITHOUT EXTENDER; 4 = WITH EXTENDER
- 1 = CARRIER SQUELCH; 3 = "PRIVATE-LINE" TONE CODED SQUELCH; 6 = "DIGITAL PRIVATE-LINE" CODED SQUELCH

ITEM	DESCRIPTION
HUB1013A	TRANSMITTER-RECEIVER UNIT (29.7-38.999 MHz)
HUB1014A	TRANSMITTER-RECEIVER UNIT (39-50 MHz)
HUB1033A	TRANSMITTER-RECEIVER UNIT WITH EXTENDER (29.7-38.999 MHz)
HUB1034A	TRANSMITTER-RECEIVER UNIT WITH EXTENDER (39-50 MHz)
HPN1003A	POWER SUPPLY
HLN4135A	CONTROL PANEL & CHASSIS, LOCAL CONTROL
HLN4136A	CONTROL PANEL & CHASSIS, REMOTE CONTROL
HLN4147A	HARDWARE, LOCAL CONTROL HI-POWER
HLN4148A	HARDWARE, REMOTE CONTROL HI-POWER
HLN4132A	INTERFACE BOARD
HHN4006A	HOUSING
KXN1087A	TRANSMITTER CHANNEL ELEMENT
KXN1085A	RECEIVER CHANNEL ELEMENT
TRN6153A	MULTI-FREQUENCY SWITCH KIT
HLN4020A	"PRIVATE-LINE" TONE ENCODER/DECODER BOARD
KLN6209A	"VIBRASPONDER" RESONANT REED
HLN4011A	"PRIVATE-LINE" DIGITAL ENCODER-DECODER BOARD
TRN6005A	"PRIVATE-LINE" DIGITAL CODE PLUG
TRN6154A	"PRIVATE-LINE" SWITCH KIT
TMN1004A	DESK MICROPHONE, CARRIER SQUELCH
TMN1005A	DESK MICROPHONE, "PRIVATE-LINE"
HLM4023A	TUNING TOOLS
TCN1217A	TONE REMOTE CONTROL KIT, 1-FREQ.; CARRIER SQUELCH
TCN1218A	TONE REMOTE CONTROL KIT, 1-FREQ.; "PRIVATE-LINE"
TCN1219A	TONE REMOTE CONTROL KIT, 2-FREQ.; "PRIVATE-LINE" & CARRIER SQUELCH
TLN4415A	"EXTENDER" SWITCH KIT

MODEL NUMBER	NUMBER OF OPERATING FREQ.	TYPE OF CONTROL	EXTENDER OPERATION	HUB1013A	HUB1014A	HUB1033A	HUB1034A	HPN1003A	HLN4135A	HLN4136A	HLN4147A	HLN4148A	HLN4132A	HHN4006A	KXN1087A	KXN1085A	TRN6153A	HLN4020A	KLN6209A	HLN4011A	TRN6005A	TRN6154A	TMN1004A	TMN1005A	HLM4023A	TCN1217A	TCN1218A	TCN1219A	TLN4415A
CARRIER SQUELCH MODELS																													
L71JJB1100AM	1	LOCAL	NO	/	/			●	●		●		●	●	●	●							●		●				
L71JJB1400AM	1	LOCAL	YES			/	/	●	●		●		●	●	●	●							●		●				●
L71JJB1130AM	2	LOCAL	NO	/	/			●	●		●		●	●	2	2	●						●		●				
L71JJB1430AM	2	LOCAL	YES			/	/	●	●		●		●	●	2	2	●						●		●				●
L71JJB1190AM	4	LOCAL	NO	/	/			●	●		●		●	●	4	4	●						●		●				
L71JJB1490AM	4	LOCAL	YES			/	/	●	●		●		●	●	4	4	●						●		●				●
L71JJB1106A	1	TONE REMOTE	NO	/	/			●		●		●	●	●	●	●									●	●			
L71JJB1406A	1	TONE REMOTE	YES			/	/	●		●		●	●	●	●	●									●	●			●
L71JJB1136A	2	TONE REMOTE	NO	/	/			●		●		●	●	●	2	2									●			●	
L71JJB1436A	2	TONE REMOTE	YES			/	/	●		●		●	●	●	2	2									●			●	●
"PRIVATE-LINE" MODELS																													
L71JJB3100AM	1	LOCAL	NO	/	/			●	●				●	●	●	●		●	2			●		●	●				
L71JJB3400AM	1	LOCAL	YES			/	/	●	●		●		●	●	●	●		●	2			●		●	●				●
L71JJB3130AM	2	LOCAL	NO	/	/			●	●		●		●	●	2	2	●	●	2			●		●	●				
L71JJB3430AM	2	LOCAL	YES			/	/	●	●		●		●	●	2	2	●	●	2			●		●	●				●
L71JJB3190AM	4	LOCAL	NO	/	/			●	●		●		●	●	4	4	●	●	2			●		●	●				
L71JJB3490AM	4	LOCAL	YES			/	/	●	●		●		●	●	4	4	●	●	2			●		●	●				●
L71JJB3106A	1	TONE REMOTE	NO	/	/			●		●		●	●	●	●	●		●	2						●		●		
L71JJB3406A	1	TONE REMOTE	YES			/	/	●		●		●	●	●	●	●		●	2						●		●		●
L71JJB3136A	2	TONE REMOTE	NO	/	/			●		●		●	●	●	2	2		●	2						●			●	
L71JJB3436A	2	TONE REMOTE	YES			/	/	●		●		●	●	●	2	2		●	2						●			●	●
"DIGITAL PRIVATE-LINE" MODELS																													
L71JJB6100AM	1	LOCAL	NO	/	/			●	●		●		●	●	●	●				●	●	●		●	●				
L57JJB6400AM	1	LOCAL	YES			/	/	●	●		●		●	●	●	●				●	●	●		●	●				●
L71JJB6130AM	2	LOCAL	NO	/	/			●	●		●		●	●	2	2	●			●	●	●		●	●				
L71JJB6430AM	2	LOCAL	YES			/	/	●	●		●		●	●	2	2	●			●	●	●		●	●				●
L71JJB6190AM	4	LOCAL	NO	/	/			●	●		●		●	●	4	4	●			●	●	●		●	●				
L71JJB6490AM	4	LOCAL	YES			/	/	●	●		●		●	●	4	4	●			●	●	●		●	●				●
L71JJB6106A	1	TONE REMOTE	NO	/	/			●		●		●	●	●	●	●				●	●				●		●		
L71JJB6406A	1	TONE REMOTE	YES			/	/	●		●		●	●	●	●	●				●	●				●		●		●
L71JJB6136A	2	TONE REMOTE	NO	/	/			●		●		●	●	●	2	2				●	●				●			●	
L71JJB6436A	2	TONE REMOTE	YES			/	/	●		●		●	●	●	2	2				●	●				●			●	●

EPS-29349-A

MODEL CHART FOR EARLIER VERSION 29.7-50 MHz, 60 W RF POWER "MITREK" SUPER "CONSOLETTE" BASE STATION RADIO SET

CODE:

- ● = ONE ITEM SUPPLIED
- 4 = NUMBER INDICATES QUANTITY SUPPLIED
- / = ONE ITEM SUPPLIED DEPENDENT UPON FREQUENCY RANGE

STATION MODEL VARIABLES

L 5 1 J J B 1 1 0 0 A M

- M = MIC INCLUDED
- 0 = LOCAL CONTROL; 6 = TONE REMOTE CONTROL
- 0 = T1-R1; 3 = T2-R2; 9 = T4-R4
- 1 = WITHOUT EXTENDER; 4 = WITH EXTENDER
- 1 = CARRIER SQUELCH; 3 = "PRIVATE-LINE" TONE CODED SQUELCH; 6 = "DIGITAL PRIVATE-LINE" CODED SQUELCH
- 4 = 30-WATT RF POWER OUTPUT; 5 = 50-WATT RF POWER OUTPUT

* REFER TO MANUAL 68P81037E65 FOR FURTHER BREAKDOWN OF THESE NUMBERS

ITEM	DESCRIPTION
HUB1003A	UNIFIED CHASSIS (29.7-38.999 MHz); NON-EXTENDER
HUB1004A	UNIFIED CHASSIS (39-50 MHz) NON-EXTENDER
HUB1023A	UNIFIED CHASSIS (29.7-38.999 MHz); w/EXTENDER
HUB1024A	UNIFIED CHASSIS (39-50 MHz); w/EXTENDER
KXN1085A	RECEIVER CHANNEL ELEMENT
KXN1087A	TRANSMITTER CHANNEL ELEMENT
KLN6209A	"VIBRASPONDER" RESONANT REED
HLN4135A	CONTROL PANEL AND CHASSIS (LOCAL CONTROL)
HLN4136A	CONTROL PANEL AND CHASSIS (REMOTE CONTROL)
HLN4144A	MISCELLANEOUS HARDWARE (LOCAL CONTROL)
HLN4133A	MISCELLAENOUS HARDWARE (REMOTE CONTROL)
HPN1001A	POWER SUPPLY
TLN4415A	EXTENDER SWITCH KIT
TRN6153A	MULTI-FREQUENCY SWITCH KIT
HLN4020A	"PRIVATE-LINE" TONE ENCODER/DECODER BOARD
HLN4011A	"DIGITAL PRIVATE-LINE" ENCODER/DECODER BOARD
HLN4132A	INTERFACE BOARD
TRN6154A	PANEL AND HARDWARE KIT
TRN6005A	CODE PLUG
HHN4006A	RADIO HOUSING
TMN1004A	DESK MICROPHONE, CARRIER SQUELCH
TMN1005A	DESK MICROPHONE, "PRIVATE-LINE"
TCN1217A	TONE REMOTE CONTROL KIT, 1-FREQ.; CARRIER SQUELCH
TCN1218A	TONE REMOTE CONTROL KIT, 1-FREQ.; "PRIVATE-LINE"
TCN1219A	TONE REMOTE CONTROL KIT, 2-FREQ.; "PRIVATE-LINE"
HLN4023A	TUNING TOOL

MODEL NUMBER	NUMBER OF OPERATING FREQ.	TYPE OF CONTROL	EXTENDER OPERATION	HUB1003A	HUB1004A	HUB1023A	HUB1024A	KXN1085A	KXN1087A	KLN6209A	HLN4135A	HLN4136A	HLN4144A	HLN4133A	HPN1001A	TLN4415A	TRN6153A	HLN4020A	HLN4011A	HLN4132A	TRN6154A	TRN6005A	HHN4006A	TMN1004A	TMN1005A	TCN1217A	TCN1218A	TCN1219A	HLN4023A
CARRIER SQUELCH MODELS																													
L51JJB1100AM	1	LOCAL	NO	/	/			●	●		●		●		●					●			●	●				●	
L51JJB1400AM	1	LOCAL	YES			/	/	●	●		●		●		●	●				●			●	●				●	
L51JJB1130AM	2	LOCAL	NO	/	/			2	2		●		●		●		●			●			●	●				●	
L51JJB1430AM	2	LOCAL	YES			/	/	2	2		●		●		●	●	●			●			●	●				●	
L51JJB1190AM	4	LOCAL	NO	/	/			4	4		●		●		●		●			●			●	●				●	
L51JJB1490AM	4	LOCAL	YES			/	/	4	4		●		●		●	●	●			●			●	●				●	
L51JJB1106A	1	TONE REMOTE	NO	/	/			●	●			●		●	●					●			●			●		●	
L51JJB1406A	1	TONE REMOTE	YES			/	/	●	●			●		●	●	●				●			●			●		●	
L51JJB1136A	2	TONE REMOTE	NO	/	/			2	2			●		●	●					●			●				●	●	
L51JJB1436A	2	TONE REMOTE	YES			/	/	2	2			●		●	●	●				●			●				●	●	
"PRIVATE-LINE" MODELS																													
L51JJB3100AM	1	LOCAL	NO	/	/			●	●	2	●		●		●			●		●	●		●		●			●	
L51JJB3400AM	1	LOCAL	YES			/	/	●	●	2	●		●		●	●		●		●	●		●		●			●	
L51JJB3130AM	2	LOCAL	NO	/	/			2	2	2	●		●		●		●	●		●	●		●		●			●	
L51JJB3430AM	2	LOCAL	YES			/	/	2	2	2	●		●		●	●	●	●		●	●		●		●			●	
L51JJB3190AM	4	LOCAL	NO	/	/			4	4	2	●		●		●		●	●		●	●		●		●			●	
L51JJB3490AM	4	LOCAL	YES			/	/	4	4	2	●		●		●	●	●	●		●	●		●		●			●	
L51JJB3106A	1	TONE REMOTE	NO	/	/			●	●	2		●		●	●			●		●			●				●	●	
L51JJB3406A	1	TONE REMOTE	YES			/	/	●	●	2		●		●	●	●		●		●			●				●	●	
L51JJB3136A	2	TONE REMOTE	NO	/	/			2	2	2		●		●	●			●		●			●					●	
L51JJB3436A	2	TONE REMOTE	YES			/	/	2	2	2		●		●	●	●		●		●			●					●	
"DIGITAL PRIVATE- LINE" MODELS																													
L51JJB6100AM	1	LOCAL	NO	/	/			●	●		●		●		●				●	●	●	●	●		●			●	
L51JJB6400AM	1	LOCAL	YES			/	/	●	●		●		●		●	●			●	●	●	●	●		●			●	
L51JJB6130AM	2	LOCAL	NO	/	/			2	2		●		●		●		●		●	●	●	●	●		●			●	
L51JJB6430AM	2	LOCAL	YES			/	/	2	2		●		●		●	●	●		●	●	●	●	●		●			●	
L51JJB6190AM	4	LOCAL	NO	/	/			4	4		●		●		●		●		●	●	●	●	●		●			●	
L51JJB6490AM	4	LOCAL	YES			/	/	4	4		●		●		●	●	●		●	●	●	●	●		●			●	
L51JJB6106A	1	TONE REMOTE	NO	/	/			●	●			●		●	●				●	●		●	●				●	●	
L51JJB6406A	1	TONE REMOTE	YES			/	/	●	●			●		●	●	●			●	●		●	●				●	●	
L51JJB6136A	2	TONE REMOTE	NO	/	/			2	2			●		●	●				●	●		●	●					●	
L51JJB6436A	2	TONE REMOTE	YES			/	/	2	2			●		●	●	●			●	●		●	●					●	

EPS-28798-A

MODEL CHART FOR EARLIER VERSION 136-174 MHz, 40 W RF POWER 136-174 MHz, 60 W RF POWER "MITREK" SUPER "CONSOLETTE" BASE STATION RADIO SET

CODE:

- ● = ONE ITEM SUPPLIED
- 4 = NUMBER INDICATES QUANTITY SUPPLIED
- / = ONE ITEM SUPPLIED DEPENDENT UPON FREQUENCY RANGE

STATION MODEL VARIABLES

NOTE: STATION MODELS ARE NOT AVAILABLE FOR ALL POSSIBLE LETTER AND NUMBER COMBINATIONS

L 4 3 J J B 1 1 0 0 A M

- M = MIC INCLUDED
- 0 = LOCAL CONTROL
- 6 = TONE REMOTE CONTROL
- 0 = T1-R1
- 3 = T2-R2
- 9 = T4-R4
- 1 = CARRIER SQUELCH
- 3 = "PRIVATE-LINE" TONE CODED SQUELCH
- 6 = "DIGITAL PRIVATE-LINE" CODED SQUELCH
- 4 = 40-WATT RF POWER OUTPUT
- 5 = 60-WATT RF POWER OUTPUT

ITEM	DESCRIPTION
HUD1003A	UNIFIED CHASSIS (136-150.8 MHz) 40-WATT
HUD1004A	UNIFIED CHASSIS (146-174 MHz) 40-WATT
HUD1013A	UNIFIED CHASSIS (136-150.8 MHz) 60-WATT
HUD1014A	UNIFIED CHASSIS (146-174 MHz) 60-WATT
KXN1086B	RECEIVER CHANNEL ELEMENT
KXN1088A	TRANSMITTER CHANNEL ELEMENT
KLN6209A	"VIBRASPONDER" RESONANT REED
HLN4135A	CONTROL PANEL AND CHASSIS (LOCAL CONTROL)
HLN4136A	CONTROL PANEL AND CHASSIS (REMOTE CONTROL)
HLN4144A	MISCELLANEOUS HARDWARE
HLN4133A	MISCELLAENOUS HARDWARE
HPN1001A	POWER SUPPLY
TRN6153A	MULTI-FREQUENCY SWITCH KIT
HLN4020A	"PRIVATE-LINE" TONE ENCODER/DECODER BOARD
HLN4011A	"DIGITAL PRIVATE-LINE" ENCODER/DECODER BOARD
TRN6005A	CODE PLUG
HLN4132A	INTERFACE BOARD
TRN6154A	PANEL AND HARDWARE KIT
HHN4006A	RADIO HOUSING
TMN1004A	DESK MICROPHONE, CARRIER SQUELCH
TMN1005A	DESK MICROPHONE, "PRIVATE-LINE"
TCN1217A	TONE REMOTE CONTROL KIT, 1-FREQ.; CARRIER SQUELCH
TCN1218A	TONE REMOTE CONTROL KIT, 1-FREQ.; "PRIVATE-LINE"
TCN1219A	TONE REMOTE CONTROL KIT, 2-FREQ.; "PRIVATE-LINE"
HLN4023A	TUNING TOOL

MODEL NUMBER	NUMBER OF OPERATING FREQ.	TYPE OF CONTROL	TRANSMITTER POWER OUTPUT
CARRIER SQUELCH MODELS			
L43JJB1100AM	1	LOCAL	40 W
L53JJB1100AM	1	LOCAL	60 W
L43JJB1130AM	2	LOCAL	40 W
L53JJB1130AM	2	LOCAL	60 W
L43JJB1190AM	4	LOCAL	40 W
L53JJB1190AM	4	LOCAL	60 W
L43JJB1106A	1	TONE REMOTE	40 W
L53JJB1106A	1	TONE REMOTE	60 W
L43JJB1136A	2	TONE REMOTE	40 W
L53JJB1136A	2	TONE REMOTE	60 W
"PRIVATE-LINE" MODELS			
L43JJB3100AM	1	LOCAL	40 W
L53JJB3100AM	1	LOCAL	60 W
L43JJB3130AM	2	LOCAL	40 W
L53JJB3130AM	2	LOCAL	60 W
L43JJB3190AM	4	LOCAL	40 W
L53JJB3190AM	4	LOCAL	60 W
L43JJB3106A	1	TONE REMOTE	40 W
L53JJB3106A	1	TONE REMOTE	60 W
L43JJB3136A	2	TONE REMOTE	40 W
L53JJB3136A	2	TONE REMOTE	60 W
"DIGITAL PRIVATE-LINE" MODELS			
L43JJB6100AM	1	LOCAL	40 W
L53JJB6100AM	1	LOCAL	60 W
L43JJB6130AM	2	LOCAL	40 W
L53JJB6130AM	2	LOCAL	60 W
L43JJB6190AM	4	LOCAL	40 W
L53JJB6190AM	4	LOCAL	60 W
L43JJB6106A	1	TONE REMOTE	40 W
L53JJB6106A	1	TONE REMOTE	60 W
L43JJB6136A	2	TONE REMOTE	40 W
L53JJB6136A	2	TONE REMOTE	60 W

MODEL NUMBER	HUD1003A	HUD1004A	HUD1013A	HUD1014A	KXN1086B	KXN1088A	KLN6209A	HLN4135A	HLN4136A	HLN4144A	HLN4133A	HPN1001A	TRN6153A	HLN4020A	HLN4011A	TRN6005A	HLN4132A	TRN6154A	HHN4006A	TMN1004A	TMN1005A	TCN1217A	TCN1218A	TCN1219A	HLN4023A
L43JJB1100AM	/	/			●	●		●		●		●					●		●	●					●
L53JJB1100AM			/	/	●	●		●		●		●					●		●	●					●
L43JJB1130AM	/	/			2	2		●		●		●	●				●		●	●					●
L53JJB1130AM			/	/	2	2		●		●		●	●				●		●	●					●
L43JJB1190AM	/	/			4	4		●		●		●	●				●		●	●					●
L53JJB1190AM			/	/	4	4		●		●		●	●				●		●	●					●
L43JJB1106A	/	/			●	●			●		●	●					●		●			●			●
L53JJB1106A			/	/	●	●			●		●	●					●		●			●			●
L43JJB1136A	/	/			●	●			●		●	●					●		●					●	●
L53JJB1136A			/	/	2	2			●		●	●					●		●					●	●
L43JJB3100AM	/	/			●	●	2	●		●		●		●			●	●	●		●				●
L53JJB3100AM			/	/	●	●	2	●		●		●		●			●	●	●		●				●
L43JJB3130AM	/	/			2	2	2	●		●		●	●	●			●	●	●		●				●
L53JJB3130AM			/	/	2	2	2	●		●		●	●	●			●	●	●		●				●
L43JJB3190AM	/	/			4	4	2	●		●		●	●	●			●	●	●		●				●
L53JJB3190AM			/	/	4	4	2	●		●		●	●	●			●	●	●		●				●
L43JJB3106A	/	/			●	●	2		●		●	●		●			●		●				●		●
L53JJB3106A			/	/	●	●	2		●		●	●		●			●		●				●		●
L43JJB3136A	/	/			2	2	2		●		●	●		●			●		●					●	●
L53JJB3136A			/	/	2	2	2		●		●	●		●			●		●					●	●
L43JJB6100AM	/	/			●	●		●		●		●			●	●	●	●	●		●				●
L53JJB6100AM			/	/	●	●		●		●		●			●	●	●	●	●		●				●
L43JJB6130AM	/	/			2	2		●		●		●	●		●	●	●	●	●		●				●
L53JJB6130AM			/	/	2	2		●		●		●	●		●	●	●	●	●		●				●
L43JJB6190AM	/	/			4	4		●		●		●	●		●	●	●	●	●		●				●
L53JJB6190AM			/	/	4	4		●		●		●	●		●	●	●	●	●		●				●
L43JJB6106A	/	/			●	●			●		●	●			●	●	●		●				●		●
L53JJB6106A			/	/	●	●			●		●	●			●	●	●		●				●		●
L43JJB6136A	/	/			2	2			●		●	●			●	●	●		●					●	●
L53JJB6136A			/	/	2	2			●		●	●			●	●	●		●					●	●

EPS-28799-A

MODEL CHART FOR EARLIER VERSION 146-174 MHz, 110 W RF POWER "MITREK" SUPER "CONSOLETTE" BASE STATION RADIO SET

CODE:

- ● = ONE ITEM SUPPLIED
- 4 = NUMBER INDICATES QUANTITY SUPPLIED
- / = ONE ITEM SUPPLIED DEPENDENT UPON FREQUENCY RANGE

STATION MODEL VARIABLES

NOTE: STATION MODELS ARE NOT AVAILABLE FOR ALL POSSIBLE LETTERS AND NUMBER COMBINATIONS

L 7 1 J J B 1 1 0 0 A M

- M = MIC INCLUDED
- 0 = LOCAL CONTROL
- 6 = TONE REMOTE CONTROL
- 0 = T1-R1
- 3 = T2-R2
- 9 = T4-R4
- 1 = WITHOUT EXTENDER
- 4 = WITH EXTENDER
- 1 = CARRIER SQUELCH
- 3 = "PRIVATE-LINE" TONE CODED SQUELCH
- 6 = "DIGITAL PRIVATE-LINE" CODED SQUELCH

ITEM	DESCRIPTION
HUD1034A	TRANSMITTER-RECEIVER UNIT (146-174 MHz)
HPN1003A	POWER SUPPLY
HLN4135A	CONTROL PANEL & CHASSIS, LOCAL CONTROL
HLN4136A	CONTROL PANEL & CHASSIS, REMOTE CONTROL
HLN4147A	HARDWARE, LOCAL CONTROL HI-POWER
HLN4148A	HARDWARE, REMOTE CONTROL HI POWER
HLN4132A	INTERFACE BOARD
HHN4006A	HOUSING
KXN1087A	TRANSMITTER CHANNEL ELEMENT
KXN1085A	RECEIVER CHANNEL ELEMENT
TRN6153A	MULTI-FREQ. SWITCH
HLN4020A	"PRIVATE-LINE" TONE ENCODER-DECODER BOARD
KLN6209A	"VIBRASPONDER" RESONANT REED
HLN4011A	"DIGITAL PRIVATE-LINE" ENCODER-DECODER BOARD
TRN6005A	"DIGITAL PRIVATE-LINE" CODE PLUG
TRN6154A	"PRIVATE-LINE" SWITCH KIT
TMN1004A	DESK MICROPHONE, CARRIER SQUELCH
TMN1005A	DESK MICROPHONE, "PRIVATE-LINE"
HLN4023A	TUNING TOOLS
TCN1217A	TONE REMOTE CONTROL, 1-FREQ., CARRIER SQUELCH
TCN1218A	TONE REMOTE CONTROL, 1-FREQ., "PRIVATE-LINE"
TCN1219A	TONE REMOTE CONTROL, 2-FREQ., "PRIVATE-LINE"

MODEL NUMBER	NUMBER OF OPERATING FREQ.	TYPE OF CONTROL
CARRIER SQUELCH MODELS		
L73JJB1100AM	1	LOCAL
L73JJB1130AM	2	LOCAL
L73JJB1190AM	4	LOCAL
L73JJB1106A	1	TONE REMOTE
L73JJB1136A	2	TONE REMOTE
"PRIVATE-LINE" MODELS		
L73JJB3100AM	1	LOCAL
L73JJB3130AM	2	LOCAL
L73JJB3190AM	4	LOCAL
L73JJB3106A	1	TONE REMOTE
L73JJB3136A	2	TONE REMOTE
"DIGITAL PRIVATE-LINE" MODELS		
L73JJB6100AM	1	LOCAL
L73JJB6130AM	2	LOCAL
L73JJB6190AM	4	LOCAL
L73JJB6106A	1	TONE REMOTE
L73JJB6136A	2	TONE REMOTE

MODEL NUMBER	HUD1034A	HPN1003A	HLN4135A	HLN4136A	HLN4147A	HLN4148A	HLN4132A	HHN4006A	KXN1087A	KXN1085A	TRN6153A	HLN4020A	KLN6209A	HLN4011A	TRN6005A	TRN6154A	TMN1004A	TMN1005A	HLN4023A	TCN1217A	TCN1218A	TCN1219A
L73JJB1100AM	/	●	●		●		●	●	●	●							●		●			
L73JJB1130AM	/	●	●		●		●	●	2	2	●						●		●			
L73JJB1190AM	/	●	●		●		●	●	4	4	●						●		●			
L73JJB1106A	/	●		●		●	●	●	●	●									●	●		●
L73JJB1136A	/	●		●		●	●	●	2	2									●			
L73JJB3100AM	/	●	●		●		●	●	●	●		●	2			●		●	●			
L73JJB3130AM	/	●	●		●		●	●	2	2	●	●	2			●		●	●			
L73JJB3190AM	/	●	●		●		●	●	4	4	●	●	2			●		●	●			
L73JJB3106A	/	●		●		●	●	●	●	●		●	2						●		●	
L73JJB3136A	/	●		●		●	●	●	2	2		●	2						●			●
L73JJB6100AM	/	●	●		●		●	●	●	●				●	●	●		●	●			
L73JJB6130AM	/	●	●		●		●	●	2	2	●			●	●	●		●	●			
L73JJB6190AM	/	●	●		●		●	●	4	4	●			●	●	●		●	●			
L73JJB6106A	/	●		●		●	●	●	●	●				●	●				●		●	
L73JJB6136A	/	●		●		●	●	●	2	2				●	●				●			●

EPS-29350-A

MODEL CHART FOR 403-512 MHz, 30 W RF POWER 403-512 MHz, 50 W RF POWER "MITREK" SUPER "CONSOLETTE" BASE STATION RADIO SET

CODE:

● = ONE ITEM SUPPLIED

4 = NUMBER INDICATES QUANTITY SUPPLIED

/ = ONE ITEM SUPPLIED DEPENDENT UPON FREQUENCY RANGE

STATION MODEL VARIABLES

NOTE: STATION MODELS ARE NOT AVAILABLE FOR ALL POSSIBLE LETTER AND NUMBER COMBINATIONS

L 4 4 J J B 1 1 0 0 A M

- M = MIC INCLUDED
- 0 = LOCAL CONTROL
- 6 = TONE REMOTE CONTROL
- 0 = T1-R1
- 3 = T2-R2
- 9 = T4-R4
- 1 = CARRIER SQUELCH
- 3 = "PRIVATE-LINE" TONE CODED SQUELCH
- 6 = "DIGITAL PRIVATE-LINE" CODED SQUELCH
- 4 = 30-WATT RF POWER OUTPUT
- 5 = 50-WATT RF POWER OUTPUT

ITEM	DESCRIPTION
HUE1003A	UNIFIED CHASSIS (403-420 MHz) 30-WATT
HUE1004A	UNIFIED CHASSIS (450-512 MHz) 30-WATT
HUE1013A	UNIFIED CHASSIS (403-420 MHz) 50-WATT
HUE1014A	UNIFIED CHASSIS (450-512 MHz) 50-WATT
KXN1086B	RECEIVER CHANNEL ELEMENT
KXN1095A	TRANSMITTER CHANNEL ELEMENT
KLN6209A	"VIBRASPONDER" RESONANT REED
HLN4135A	CONTROL PANEL AND CHASSIS (LOCAL CONTROL)
HLN4136A	CONTROL PANEL AND CHASSIS (REMOTE CONTROL)
HLN4144A	MISCELLANEOUS HARDWARE
HLN4133A	MISCELLAENOUS HARDWARE
HPN1001A	POWER SUPPLY
TRN6153A	MULTI-FREQUENCY SWITCH KIT
HLN4020A	"PRIVATE-LINE" TONE ENCODER/DECODER BOARD
HLN4011A	"DIGITAL PRIVATE-LINE" ENCODER/DECODER BOARD
TRN6005A	CODE PLUG
HLN4132A	INTERFACE BOARD
TRN6154A	PANEL AND HARDWARE KIT
HHN4006A	RADIO HOUSING
TMN1004B	DESK MICROPHONE, CARRIER SQUELCH
TMN1005B	DESK MICROPHONE, "PRIVATE-LINE"
TCN1217A	TONE REMOTE CONTROL KIT, 1-FREQ.; CARRIER SQUELCH
TCN1218A	TONE REMOTE CONTROL KIT, 1-FREQ.; "PRIVATE-LINE"
TCN1219A	TONE REMOTE CONTROL KIT, 2-FREQ.; "PRIVATE-LINE"
HLN4023A	TUNING TOOL
HPN1003A	POWER SUPPLY

MODEL NUMBER	NUMBER OF OPERATING FREQ.	TYPE OF CONTROL	TRANSMITTER POWER OUTPUT	HUE1003A	HUE1004A	HUE1013A	HUE1014A	KXN1086B	KXN1095A	KLN6209A	HLN4135A	HLN4136A	HLN4144A	HLN4133A	HPN1001A	TRN6153A	HLN4020A	HLN4011A	TRN6005A	HLN4132A	TRN6154A	HHN4006A	TMN1004B	TMN1005B	TCN1217A	TCN1218A	TCN1219A	HLN4023A	HPN1003A
CARRIER SQUELCH MODELS																													
L44JJB1100AM	1	LOCAL	30 W	/	/			●	●		●		●		●					●		●	●					●	
L54JJB1100AM	1	LOCAL	50 W			/	/	●	●		●		●							●		●	●					●	●
L44JJB1130AM	2	LOCAL	30 W	/	/			2	2		●		●		●	●				●		●	●					●	
L54JJB1130AM	2	LOCAL	50 W			/	/	2	2		●		●			●				●		●	●					●	●
L44JJB1190AM	4	LOCAL	30 W	/	/			4	4		●		●		●	●				●		●	●					●	
L54JJB1190AM	4	LOCAL	50 W			/	/	4	4		●		●			●				●		●	●					●	●
L44JJB1106A	1	TONE REMOTE	30 W	/	/			●	●			●		●	●					●		●			●			●	
L54JJB1106A	1	TONE REMOTE	50 W			/	/	●	●			●		●						●		●			●			●	●
L44JJB1136A	2	TONE REMOTE	30 W	/	/			2	2			●		●	●					●		●					●	●	
L54JJB1136A	2	TONE REMOTE	50 W			/	/	2	2			●		●						●		●					●	●	●
"PRIVATE-LINE" MODELS																													
L44JJB3100AM	1	LOCAL	30 W	/	/			●	●	2	●		●		●		●			●	●	●		●				●	
L54JJB3100AM	1	LOCAL	50 W			/	/	●	●	2	●		●				●			●	●	●		●				●	●
L44JJB3130AM	2	LOCAL	30 W	/	/			2	2	2	●		●		●	●	●			●	●	●		●				●	
L54JJB3130AM	2	LOCAL	50 W			/	/	2	2	2	●		●			●	●			●	●	●		●				●	●
L44JJB3190AM	4	LOCAL	30 W	/	/			4	4	2	●		●		●	●	●			●	●	●		●				●	
L54JJB3190AM	4	LOCAL	50 W			/	/	4	4	2	●		●			●	●			●	●	●		●				●	●
L44JJB3106A	1	TONE REMOTE	30 W	/	/			●	●	2		●		●	●		●			●		●				●		●	
L54JJB3106A	1	TONE REMOTE	50 W			/	/	●	●	2		●		●			●			●		●				●		●	●
L44JJB3136A	2	TONE REMOTE	30 W	/	/			2	2	2		●		●	●		●			●		●					●	●	
L54JJB3136A	2	TONE REMOTE	50 W			/	/	2	2	2		●		●			●			●		●					●	●	●
"DIGITAL PRIVATE-LINE" MODELS																													
L44JJB6100AM	1	LOCAL	30 W	/	/			●	●		●		●		●			●	●	●	●	●		●				●	
L54JJB6100AM	1	LOCAL	50 W			/	/	●	●		●		●					●	●	●	●	●		●				●	●
L44JJB6130AM	2	LOCAL	30 W	/	/			2	2		●		●		●	●		●	●	●	●	●		●				●	
L54JJB6130AM	2	LOCAL	50 W			/	/	2	2		●		●			●		●	●	●	●	●		●				●	●
L44JJB6190AM	4	LOCAL	30 W	/	/			4	4		●		●		●	●		●	●	●	●	●		●				●	
L54JJB6190AM	4	LOCAL	50 W			/	/	4	4		●		●			●		●	●	●	●	●		●				●	●
L44JJB6106A	1	TONE REMOTE	30 W	/	/			●	●			●		●	●			●	●	●		●				●		●	
L54JJB6106A	1	TONE REMOTE	50 W			/	/	●	●			●		●				●	●	●		●				●		●	●
L44JJB6136A	2	TONE REMOTE	30 W	/	/			2	2			●		●	●			●	●	●		●					●	●	
L54JJB6136A	2	TONE REMOTE	50 W			/	/	2	2			●		●				●	●	●		●					●	●	●

EPS-28800-A

Model Breakdowns

Kit Number	Description
TCN1271A One-Frequency Carrier Squelch Tone Remote Control	
TCN1220A	One-Frequency Carrier Squelch Tone Remote Control Kit
KLN6209A	"Vibrasponder" Resonant Reed
TRN6742A	One-Frequency Carrier Squelch Tone Remote Control Board
TRN6299A	Tone Remote Control Hardware Kit
TCN1218A One-Frequency "Private-Line" Tone Remote Control	
TCN1221A	One-Frequency "Private-Line" Tone Remote Control Kit
KLN6209A	"Vibrasponder" Resonant Reed
TRN6743A	One-Frequency "Private-Line" Tone Remote Control Board
TRN6299A	Tone Remote Control Hardware Kit
TCN1219A Two-Frequency "Private-Line" Tone Remote Control	
TCN1222A	Two-Frequency "Private-Line" Tone Remote Control Kit
KLN6209A	"Vibrasponder" Resonant Reed
TRN6744A	Two-Frequency "Private-Line" Tone Remote Control Board
TRN6299A	Tone Remote Control Hardware Kit
HPN1001A Power Supply	
HKN4053A	Power Supply Cable Kit
HLN4130A	Power Supply Chassis
HLN4151A	Hardware Kit
TLN4405A	Circuit Board Kit
HPN1003A Power Supply	
HLN4139A	Power Supply Chassis
HLN4153A	Hardware Kit
TLN5779A	Circuit board Kit
TMN1004B Desk Microphone (Carrier Squelch)	
TRN8986A	"Private-Line" Microphone Circuit Board
THN6388A	Microphone Housing and Hardware Kit
TKN8063A	Microphone Cable Kit
TMN1005B Desk Microphone ("Private-Line")	
TRN8986A	"Private-Line" Microphone Circuit Board
THN6389A	Microphone Housing and Hardware Kit
TKN8063A	Microphone Cable Kit

Transmitter-Receiver Unit Unified Chassis Cross Reference Chart

"Mitrek" Super "Consolette" Base Station	"Mitrek" Mobile Radio	Frequency	Power
HUB1003B	HUB1001B	29.7-38.99 MHz	60 W
HUB1004B	HUB1002B	39-50 MHz	60 W
HUB1023B	HUB1021B with Extender	29.7-38.99 MHz	60 W
HUB1024B	HUB1022B with Extender	39.50 MHz	60 W
HUB1013B	HUB1011B	29.7-38.99 MHz	110 W
HUB1014B	HUB1012B	39-50 MHz	110 W
HUB1033B	HUB1031B with Extender	29.7-38.99 MHz	110 W
HUB1034B	HUB1032B with Extender	39-50 MHz	110 W
HUD1003B	HUD1001B	136-150.8 MHz	40 W
HUD1004B	HUD1002B	146-174 MHz	40 W
HUD1013B	HUD1011B	136-150.8 MHz	60 W
HUD1014B	HUD1012B	146-174 MHz	60 W
HUD1034B	HUD1032B	146-174 MHz	110 W
HUE1003A	HUE1001A	403-420 MHz	30 W
HUE1004A	HUE1002A	450-512 MHz	30 W
HUE1007A	HUE1005A with Pre-Amp	403-420 MHz	30 W
HUE1008A	HUE1006A with Pre-Amp	450-512 MHz	30 W
HUE1013A	HUE1011A	403-420 MHz	50 W
HUE1014A	HUE1012A	450-512 MHz	50 W
HUE1017A	HUE1015A with Pre-Amp	403-420 MHz	50 W
HUE1018A	HUE1016A with Pre-Amp	450-512 MHz	50 W

OPTION CHART

Option	Add	Delete	Applicability
L11AB	HLN4012A Time-Out Timer	Nothing	All Models
L12AC	HLD4051A VHF Pre-Amp (R1) HLD4052A VHF Pre-Amp (R2)	Nothing	All 136-174 MHz Models
L12AD	HUE1007A UHF Unified Chassis (R1) w/Pre-Amp; 30-Watt or HUE1008A UHF Unified Chassis (R2) w/Pre-Amp; 30-Watt	HUE1003A UHF Unified Chassis (R1) or HUE1004A UHF Unified Chassis (R2)	All 403-512 MHz "A" Version Models
L12AE	HUE1017A UHF Unified Chassis (R1) w/Pre-Amp; 50-Watt or HUE1018A UHF Unified Chassis (R2) w/Pre-Amp; 50-Watt	HUE1013A UHF Unified Chassis (R1) or HUE1014A UHF Unified Chassis (R2)	All 403-512 MHz "A" Version Models
L25AH	TLN1735A Tone Alert Kit	Nothing	All Local Control Models
L28AA	TLN1374B Emergency Power Kit	Nothing	All 60-Watt, 29.7-50 MHz; 40 & 60-Watt, 136-174 MHz; 30-Watt, 403-512 MHz Models
L32AE	TRN6182A 12 V DC Operation Only Kit	HPN1001A Power Supply (120 V, 60 Hz)	
L32AF	TRN6182A 12 V DC Operation Only Kit	HPN1003A Power Supply	All 50-Watt, 403-512 MHz Models
L42AC	HLN1048A "Channel-Scan"	TRN6153A Multi-Frequency Switch Kit	All Four-Frequency, Local Control Models
L43AE	HPN1002A Power Supply (120, 220, 240 V, 50-60 Hz)	HPN1001A Power Supply (120 V, 60 Hz)	All 60-Watt, 29.7-50 MHz; 60-Watt, 136-174 MHz & 30-Watt, 403-512 MHz Models
L43AF	HPN1000A Power Supply (120, 220, 240 V, 50-60 Hz)	HPN1003A Power Supply (120 V, 60 Hz)	All 50-Watt, 403-512 MHz Models
L63AB	HLN1054A Paging Conversion Kit	Nothing	All Local Control "Private-Line" Models
L72AB	Nothing	TMN1004A Desk Microphone	All Local Control, Carrier Squelch Models
L73AB	Nothing	TMN1005A Desk Microphone	All Local Control, "Private-Line" Models
L114AB	TLN1734A VU Metering	Nothing	All Local Control Models
L132AE	KLN1088A 5 PPM Transmitter Channel Element	KXN1095A 2 PPM Transmitter Channel Element	All 30-Watt 403-512 MHz, One-Frequency Models
L132AF	Two KXN1038A 5 PPM Transmitter Channel Element	Two KXN1095A 2 PPM Transmitter Channel Elements	All 30-Watt 403-512 MHz, Two-Frequency Models
L132AG	Four KXN1088A 5 PPM Transmitter Channel Elements	Four KXN1095A 2 PPM Transmitter Channel Elements	All 30-Watt 403-512 MHz, Four-Frequency Models
L139AG	TCN1214A DC Remote Control Kit	TCN1217A Tone Remote Control Kit	All Single Frequency Tone Remote Control Models (Carrier Squelch)
L139AH	TCN1215A DC Remote Control Kit	TCN1218A Tone Remote Control Kit	All Single Frequency Tone Remote Control Models ("Private-Line")
L139AJ	TCN1216A DC Remote Control Kit	TCN1219A Tone Remote Control Kit	All Two-Frequency Tone Remote Control Models
L149AA	HLN4138A DC Metering Kit	Nothing	All Local Control Models
L168AG	HLN4137A Local Remote Panel & Chassis Kit TCN1217A Tone Remote Control Kit	HLN4135A Local Control Panel & Chassis Kit	All Single Frequency Local Control Models (Carrier Squelch)
L168AH	HLN4137A Local Remote Panel & Chassis Kit TCN1218A Tone Remote Control Kit	HLN4135A Local Control Panel & Chassis Kit	All Single Frequency Local Control Models "Private-Line")
L168AJ	HLN4137A Local Remote Control Panel & Chassis TCN1219A Tone Remote Control Kit TRN6183A Remote Multi-Frequency Switch Kit	HLN4135A Local Control Panel & Chassis TRN6153A Multi-Frequency Switch Kit	All Two-Frequency Local Control Models
L169AH	HLN4137A Local Remote Control Panel & Chassis TCN1214A DC Remote Control Kit	TLN4135A Local Control Panel & Chassis	All Single Frequency Local Control Models (Carrier Squelch)
L169AJ	HLN4137A Local Remote Control Panel & Chassis TCN1215A DC Remote Control Kit	HLN4135A Local Control Panel & Chassis	All Single Frequency Local Control Models ("Private-Line")
L169AK	HLN4137A Local Remote Control Panel & Chassis TCN1216A DC Remote Control Kit TRN6183A Remote Multi-Frequency Switch Kit	HLN4135A Local Control Panel & Chassis TRN6153A Multi-Frequency Switch Kit	All Two-Frequency Local Control Models

OPTION CHART (Cont'd.)

Option	Add	Delete	Applicability
L179AC	TRN6125A Digital Clock Kit	Nothing	All Local Control Models
L226AH	HLN1043A Local Intercom Kit	Nothing	All Local Control Models
L226AJ	HLN1044A Local Remote Intercom Kit	Nothing	All Local/Remote Control Models
L273AB	TLN4427A Wall Mounting Kit	Nothing	All Models
L276AA	KLN6209A "Vibrasponder" Resonant Reed	Nothing	All Tone PL Models
L501AG	Nothing	One KXN1087A Transmitter Channel Element	All 29.7-50 MHz Models
L501AH	Nothing	One KXN1088A Transmitter Channel Element	All 136-174 MHz Models
L501AJ	Nothing	One KXN1095A Transmitter Channel Element	All 403-512 MHz Models
L502AG	Nothing	Two KXN1087A Transmitter Channel Elements	All 29.7-50 MHz, Two & Four-Frequency Models
L502AH	Nothing	Two KXN1088A Transmitter Channel Elements	All 136-174 MHz, Two & Four-Frequency Models
L502AJ	Nothing	Two KXN1095A Transmitter Channel Elements	All 403-512 MHz, Two & Four-Frequency Models
L503AE	Nothing	Three KXN1087A Transmitter Channel Elements	All 29.7-50 MHz, Four-Frequency Models
L503AF	Nothing	Three KXN1098A Transmitter Channel Elements	All 136-174 MHz, Four-Frequency Models
L503AG	Nothing	Three KXN1095A Transmitter Channel Elements	All 403-512 MHz, Four-Frequency Models
L504AE	Nothing	Four KXN1087A Transmitter Channel Elements	All 29.7-50 MHz, Four-Frequency Models
L504AF	Nothing	Four KXN1088A Transmitter Channel Elements	All 136-174 MHz, Four-Frequency Models
L504AG	Nothing	Four KXN1095A Transmitter Channel Elements	All 403-512 MHz, Four-Frequency Models
L521AG	Nothing	One KXN1085A Receiver Channel Element	All 29.7-50 MHz Models
L521AH	Nothing	One KXN1086B Receiver Channel Element	All 136-174 MHz Models
L522AG	Nothing	Two KXN1085A Receiver Channel Elements	All 29.7-50 MHz, Two & Four-Frequency Models
L522AH	Nothing	Two KXN1086B Receiver Channel Elements	All 136-174 MHz, Two & Four-Frequency Models
L532AE	Nothing	Three KXN1085A Receiver Channel Elements	All 29.7-50 MHz, Four-Frequency Models
L523AF	Nothing	Three KXN1086B Receiver Channel Elements	All 136-174 MHz, Four-Frequency Models
L524AE	Nothing	Four KXN1085A Receiver Channel Elements	All 29.7-50 MHz, Four-Frequency Models
L524AF	Nothing	Four KXN1086B Receiver Channel Elements	All 136-174 MHz, Four-Frequency Models
L566AB	TLN1736AV Single-Tone Encoder (Non-Standard)	Nothing	All Local Control Models
L567AB	TLN1736A Single-Tone Encoder (Standard)	Nothing	All Local Control Models
L276AA	TLN5730A Two-Code Adapter Board TRN6005A Code Plug	Nothing	All Two-Frequency "Digital Private-Line" Models
L521AJ	Nothing	One KXN1086B Receiver Channel Element	All 403-512 MHz Models
L522AJ	Nothing	One KXN1086B Receiver Channel Element	All 403-512 MHz, Two & Four-Frequency Models
L523AG	Nothing	Three KXN1086B Receiver Channel Elements	All 403-512 MHz, Four-Frequency Models
L524AG	Nothing	Four KXN1086B Receiver Channel Elements	All 403-512 MHz, Four-Frequency Models

DESCRIPTION

1. INTRODUCTION

The Motorola **Mitrek** Super **Consolette** base station is a compact two-way radio suitable for desk top mounting. The base stations are available in a variety of models as shown in the model charts at the front of this manual. These include the operating frequency range, i-f power output, carrier squelch, **Private-Line** tone-coded squelch, **Digital Private-Line** binary coded squelch, single- or multiple-frequency and local or remote control models. All models are designed for desk or table top installation and fully utilize the advantages of solid-state circuits — reliability, small size, ruggedness and low maintenance requirements. Contained within the compact steel cabinet is an easily removable transmitter-receiver unit, ac operated power supply, and control panel which contains all controls necessary for local operation of the station. The rear of the cabinet is equipped with an antenna connector, terminal boards for external connections and a key-lock. Efficient heat radiators to ensure safe operating temperatures for the transmitter power amplifier stages and the power supply regulator transistors extend from the rear of the cabinet. The station cabinet facilitates ease of maintenance and is easily removed from the chassis assembly by unlocking the key-lock and loosening two thumb-screws at the rear of the cabinet. All external connections (except primary power) are made at terminal boards at the rear of the chassis and need not be disturbed for removal of the cabinet. The transmitter-receiver chassis is secured to the main chassis assembly by two quick-release snap fasteners. When these are released, the transmitter-receiver unit may be readily removed for maintenance or quick access to optional kits.

2. BASIC TYPES OF STATIONS

2.1 CARRIER SQUELCH MODELS

These models are used when all transmissions on a specific frequency are to be heard. The receivers incorporate a noise-actuated squelch circuit consisting of a noise limiter, a noise detector and a dc control stage (switching circuit) to cut off audio signals to the audio amplifier. This eliminates disturbing noise which would otherwise be heard at the speaker during intervals between received messages.

2.2 **PRIVATE-LINE** CODED SQUELCH MODELS

This type of station is an improvement in FM two-way radio equipment especially when operating under crowded channel conditions. Several **Private-Line** systems can use the same rf carrier frequency in the same area if each system uses a different **Private-Line** code.

The transmitters are modulated by a continuous code signal in addition to the voice modulation. The receivers accept only correctly code-modulated signals when the "PL" ON-OFF switch is in the ON position, and reject all others.

Private-Line coded squelch models also include noise-actuated squelch circuitry as previously described for carrier squelch models. This enables the operator to monitor the channel before transmissions ("PL" ON-OFF switch in the OFF position) and prevent interference with other users on the frequency. The desk microphone supplied with "PL" stations, has a **Private-Line** disable switch to permit switching to the noise-actuated squelch circuit for monitoring purposes before transmitting.

The SQUELCH control has no effect on "PL" squelch sensitivity. In normal operation ("PL" ON), the receiver audio is activated when the on-frequency rf signal is FM modulated with the proper "PL" code to activate the **Private-Line** decoder.

Either one of two types of **Private-Line** coded squelch may be used; tone-coded or binary-coded. In **Private-Line** tone-coded squelch systems, sub-audible tones are transmitted and then detected to unsquelch the audio path in a particular receiver or group of receivers. In **Private-Line** digital binary-coded squelch systems, a 23-bit binary code word is transmitted continuously and detected to unsquelch the audio path in the receiver(s). The binary code rate is such that it falls below the

300-3000 Hz voice frequency range used in radio communications equipment, therefore, the code signals are not heard by the operator.

3. CONTROL FACILITIES

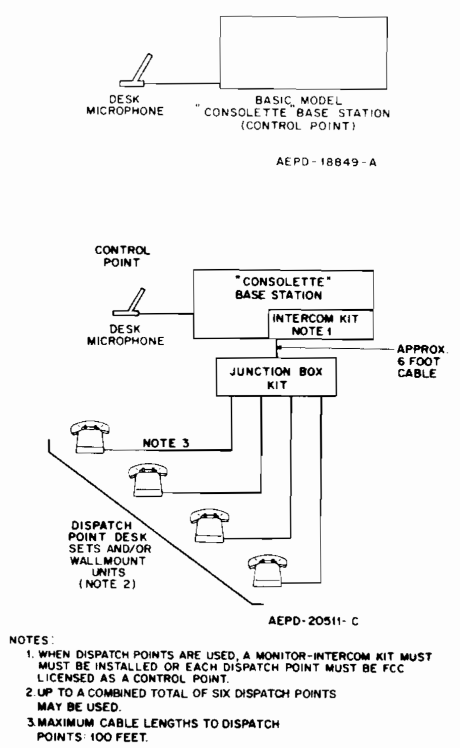
Four types of control facilities are possible with **Mitrek** Super **Consolette** base station systems: (1) local control, (2) extended local control, (3) local-remote control, and (4) remote control. Each of these types of control are described below. Usage of optional accessory equipment is given in Table 1.

3.1 LOCAL CONTROL OPERATION

In local control systems, the base station is normally supplied with a desk microphone. The desk microphone contains a TRANSMIT switch and in **Private-Line** systems, a MONITOR switch. All other controls necessary for operation are mounted on the control panel of the **Consolette** base station. This system may be a single control point station (see Figure 1) or a local control point station with multiple dispatch points. When dispatch points are used, a monitor- intercom kit is installed in the **Consolette** radio position. The **Consolette** radio position is the control point and has complete supervision over transmissions from the dispatch points. Transmit audio is monitored at all points except the point sending the message. Using the monitor-intercom kit, all dispatch points may communicate with one another and with the control point without keying the transmitter. The system incorporates a priority feature which causes any on-frequency radio message to have priority over any intercommunication taking place. (When a monitor-intercom kit is not installed, the control point does not have supervisory capability, therefore, each dispatch point must be FCC licensed as a control point.)

3.2 EXTENDED LOCAL CONTROL OPERATION

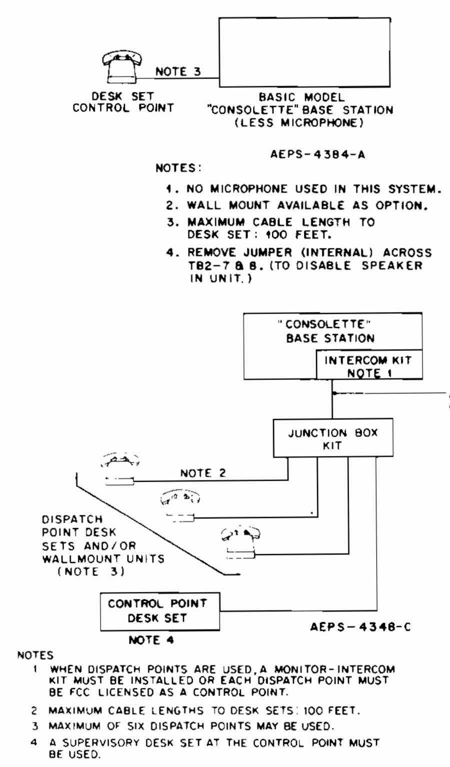
The base station can be operated in an extended local control mode in cases where the radio cannot be located on the desk top at the operators position. In this mode, a remote desk set is used as the control point with the radio located within 100 feet of the desk set. This system may be a single extended local control point station (see Figure 2) or an extended local control station with multiple dispatch points as described previously for local control systems.



A. Single Local Control Point Station

B. Local Control Point Station with Multiple Dispatch Points

Figure 1. Typical Local Control System



A. Single Extended Local Control Point Station

B. Extended Local Control Point Station with Multiple Dispatch Points

Figure 2. Typical Extended Local Control Systems

3.3 LOCAL-REMOTE CONTROL OPERATION

In local-remote systems, a distant remote control point is licensed in addition to the primary (local) control point located at the base station radio position. The radio may be controlled from only one location at a time. A switch is provided which permits transfer of the control point. The remote control point may be either a remote control console or a desk set which is connected to the **Consolette** base station via two-wire telephone lines (see Figure 3). Monitor intercom capability may be used as previously described for local control systems.

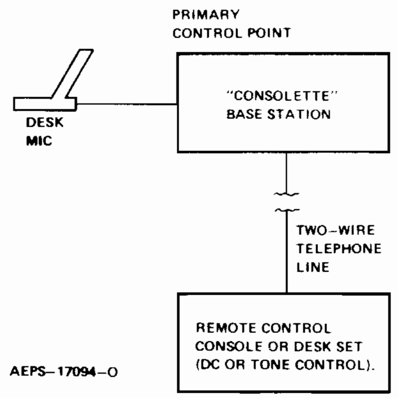


Figure 3. Typical Local-Remote Control Systems

3.4 REMOTE CONTROL OPERATION

In remote control systems, all radio control functions are conducted from a remote control console (see Figure 4). The control panel of the base station is blank except for the transmit and power-on indicators. The remote control console is connected to the **Consolette** base station via two-wire telephone lines (see Figure 4).

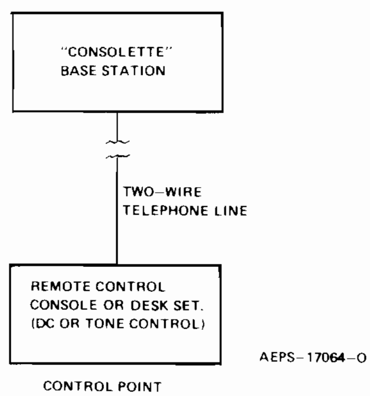


Figure 4. Typical Remote Control System

4. EQUIPMENT DESCRIPTION

4.1 CONTROL PANEL AND CHASSIS

The control panel and chassis contains all operating circuits of the **Mitrek** Super **Consolette** base station except for the microphone. The power supply is secured to the chassis by four mounting screws. The transmitter-receiver unit is secured to the chassis by two quick-release snap fasteners. Optional accessory equipment boards and/or a remote control circuit board mounts on the chassis below the transmitter-receiver unit. In local control models, the control panel contains the operating controls and indicators (including panel mounted accessories) and the station speaker. In remote control models, the control panel is normally blank except for the power-on and transmit indicators.

4.2 TRANSMITTER-RECEIVER UNIT

The transmitter-receiver is a completely transistorized FM two-way radio (less control circuitry) which fully utilizes the advantages of solid-state circuits -- reliability, small size, ruggedness and low maintenance requirements. Current demands are low, since tube filaments are eliminated and unheated crystals are used for frequency control.

A variety of models are available to give carrier or **Private-Line** coded squelch, single- or multi-frequency capability.

The **Mitrek** Mobile radio which is used as the transmitter-receiver unit in the **Mitrek** Super **Consolette** base station is mounted by two quick-release snap fasteners for easy removal. All electrical connections are made through two front panel receptacles (J1 and J4) and a four-wire cable assembly. The cable assembly connects to push-on pins within the transmitter-receiver unit. The **Mitrek** Super **Consolette** base station control cable connector P4 mates with mobile radio receptacle J1 and the internal antenna line (W2) mates with **Mitrek** radio antenna connector J4. External antenna connections are made to J105 on the rear of the **Mitrek** Super **Consolette** base station chassis.

The **Mitrek** Mobile radio used as the transmitter-receiver unit requires certain electrical modifications. As shown in Figure 5, the mobile receiver audio and squelch section is modified by the removal of capacitor C440, coil L401, and diode CR404. A four-wire cable assembly is added to connect the mobile receiver audio and squelch circuitry to the base station interface board.

The detected mobile receiver audio, from the base station mobile receiver audio preamplifier, U403A, is routed via P4-11 to the base station interface board by J201-7. Also, the detected audio is routed from P4-11 through R502 to R501, the volume level set control, and from P4-11 through R503 to R504, the SQUELCH control.

The center tap of R501 connects the detected receiver audio, via P4-15, to the mobile receiver audio preamplifier U403B and Q401. The audio from Q401 is routed, via J201-11, to the base station interface board, through the receive squelch gate U1C and audio amplifier U2D, back to the mobile receiver audio final amplifier U401, via J201-5.

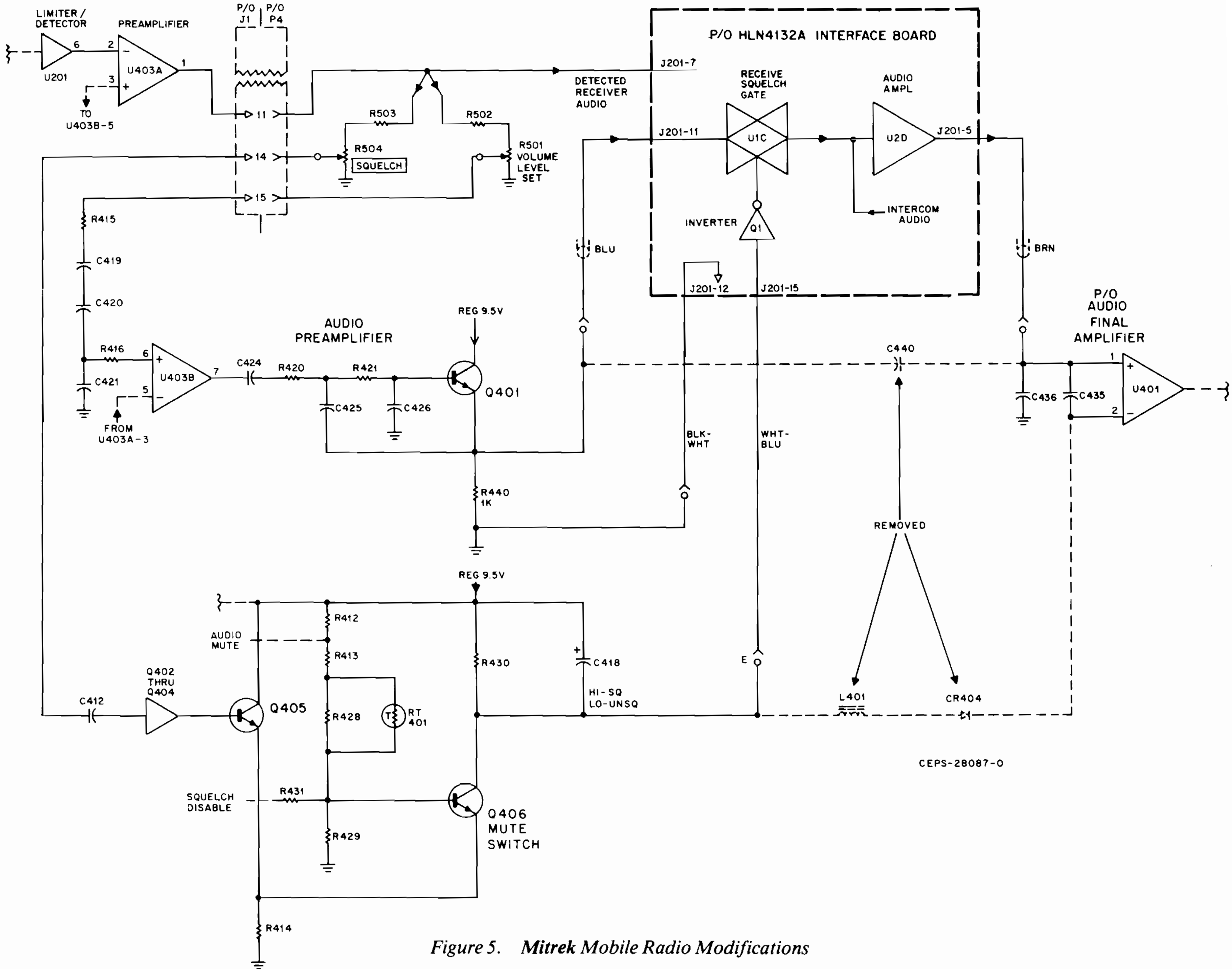


Figure 5. ***Mitrek*** *Mobile Radio Modifications*

The center tap of R504 connects the detected receiver audio, via P4-14, to the mobile receiver squelch circuit (Q402 through Q405) and mute switch Q406. Q406 is connected, via J201-15 to receive squelch gate U1C on the base station interface board. U1C squelches or unsquelches the detected mobile receiver audio. A mobile receiver radio ground reference is connected to the base station interface board at J201-12 for ground reference buffering.

NOTE

Due to the loading of the base station interface board, exciter audio, and/or microphone, inputs cannot be applied to the transmitter test socket. Exciter audio and/or microphone inputs must be applied to terminal strip TB2-6, -7 only.

The **Mitrek** Mobile radio, used as the transmitter-receiver unit in the **Mitrek** Super **Consolette**, is mechanically modified by the removal of its handle assembly, lock assembly and miscellaneous hardware pieces. Refer to the transmitter-receiver unit cross reference chart, at the front of this manual to identify the **Mitrek** Super **Consolette** electrically equivalent transmitter-receiver unit.

With the exception of these electrical and mechanical modifications, the appropriate **Mitrek** mobile radio instruction manual is fully applicable.

4.3 POWER SUPPLY

The 120-volt, 60 Hz (or optional 120-, 220-, 240-volt, 50/60 Hz) power supply is a regulated unit providing all necessary dc voltages for operation of the associated transmitter-receiver and optional accessories. The power supply consists of a power transformer, full-wave rectifier, series transistor regulator, and associated control circuits assembled on a compact chassis. The power supply is secured to the main chassis by four screws which provides easy removal to facilitate maintenance. The output of the power supply is connected to the station control panel and transmitter-receiver unit via two screw terminals located on the main chassis. The regulator transistors are mounted on an efficient heat radiator at the rear of the power supply to ensure safe operating temperatures. AC line protection is provided by a fuse located on the power supply chassis.

5. ANTENNA (NOT SUPPLIED)

The Super **Consolette** base station radio is sold as a complete, ready-to-use station (less antenna). The type of antenna required depends on local operating conditions and should be determined by a qualified communications representative. Contact your local Motorola radio communications representative for your antenna selection and ordering needs.

6. ACCESSORIES

The majority of the following described accessories are available as factory installed options in new stations, and some are required as part of specific station models. Table 1 shows the usage of accessories and defines the restrictions on using them. Also, other accessories are available which have more special application than those listed here. See your local Motorola representative for complete details on all "add-to" accessories.

Certain accessories cannot be added if the station is already equipped with another accessory. For example, dc metering cannot be added if the station is already equipped with a vu meter (see Table 1).

6.1 HLN4138A DC METER (OPTION L149A)

The meter is available for local control stations and provides metering of the transmitter and receiver circuitry directly from the control panel. A 0-50 microampere meter and an eighteen-position rotary switch are used for metering. The meter and switch permit measurement and selection of critical test points in all receiver and transmitter circuits.

NOTE

Receiver meter 4 positions are not used in **Mitrek** Super **Consolette** base stations during normal operation.

Specific circuits to be measured are connected to the meter via receptacles on the receiver and transmitter chassis. The meter is mounted on the front panel and is held in place by a clip which is supplied with the meter kit. The rotary switch is mounted on the control panel frame which is in turn fastened to the front panel.

6.2 TLN1734A VU METER (OPTION L114A)

The vu meter provides a relative indication of the speech level input to the transmitter exciter audio circuits, from a microophone or remote control line. The kit consists of a vu meter which mounts on the control panel of the station and circuit board which mounts behind the front panel. A variable attenuator on the circuit board is used to set the vu meter reading for a specific audio input level.

6.3 TLN1736A (STANDARD FREQUENCIES) OR TLN1736AV (NON-STANDARD FREQUENCIES) "SINGLE-TONE" ENCODER OPTIONS L567A OR L566A)

The transistorized multiple-frequency "Single-Tone" encoder is a selective tone source for the base station in a "Single-Tone" controlled two-way radio communication system. It permits base-to-mobile selective calling, or provides remote switching functions for control of standby equipment. Up to five fixed-frequency tones may be individually selected by a rotary switch. Jumper connections provide optional tone durations from 0.5 second to 1.5 seconds, or a continuous tone for test purposes.

The encoder may be used to tone-alert a receiving station to a pertinent incoming call, or the associated receiver may incorporate a tone decoder unit, which will

Table 1. Accessory Equipment Usage and Compatibility

Item	Station Type Usage				Accessory Compatibility												
	Local Control	Extended Local Control	Local Remote Control	Remote Control	VU Meter	DC Meter	"Single-Tone" Decoder	"Single-Tone" Encoder (non-standard) Frequencies	Alert Tone Oscillator	Channel Scan Monitor (Multi-Freq. Models only)	Digital Clock	120-, 220-, 240-Volt Power Supply	+12 V dc Kit	Monitor Intercom	DC Remote Control Board	Tone Remote Control Board	Emergency Power Reverting
VU Meter	YES		YES	NO		NO	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO
DC Meter	YES		YES	NO	NO		YES	YES	YES	NO	YES	YES	YES	YES	YES	YES	YES
"Single-Tone" Encoder	YES		NO	NO	YES	YES			NO	NO	YES	YES	YES	YES	NO	NO	
"Single-Tone" Encoder (non-standard frequencies)	YES		NO	NO	YES	YES			NO	NO	YES	YES	YES	YES	NO	NO	YES
Alert Tone Oscillator	YES		NO	NO	YES	YES	NO	NO		NO	YES	YES	YES	YES	NO	NO	YES
Channel Scan Monitor (multi-freq. models only)	YES		NO	NO	YES	NO	NO	NO	NO		YES	YES	YES	YES (NOTE)	NO	NO	YES
Digital Clock	YES		YES	NO	YES	YES	YES	YES	YES	YES		YES	NO	YES	YES	YES	YES
120-, 220-, 240-Volt Power Supply	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES			NO	YES	YES	YES	YES
+12 V dc Kit	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO	NO		YES	YES	YES	NO
Monitor-Intercom	YES		YES	NO	YES	YES	YES	YES	YES	YES (NOTE)	YES	YES	YES		YES	YES	YES
Time-Out Timer	YES	YES	YES	YES	ALL MODELS												
Wall or Rack Mount Kit	YES	YES	YES	YES	ALL MODELS												
"PL" Station Paging Conversion Kit	YES		NO	YES	"PL" MODELS ONLY									NO	NO	NO	
RF Preamplifier	YES	YES	YES	YES	ALL VHF AND UHF												
DC Remote Control	NO	NO	YES	YES	YES	YES	NO	NO	NO	NO	YES	YES	YES	YES		NO	YES
Tone Remote Control	NO	NO	YES	YES	YES	YES	NO	NO	NO	NO	YES	YES	YES	YES	NO		YES
"Private-Line" Tone Coded Squelch Encoder/Decoder	YES	YES	YES	YES	TONE "PL" MODELS ONLY												
"Private-Line" Digital Coded Squelch Encoder-Decoder	YES	YES	YES	YES	DIGITAL "PL" MODELS ONLY												
Emergency Power Reverting	YES	YES	YES	YES	NO		ALL 60 W LOW BAND, 40 & 60 W VHF, 30 W UHF			YES			NO	ALL 60 W LOW BAND, 40 & 60 W VHF, 30 W UHF			

NOTE: Not Compatible on UHF Models

GCEPS-28085-O

complete the audio output circuits. Thus, only the receiver for which the call was intended will receive the message. Also, a tone-decoder equipped receiver can energize an external control circuit for repeater or alarm systems.

6.4 TLN1735A ALERT TONE OSCILLATOR OPTION L25A)

The alert-tone oscillator provides a 1000-Hz tone that can be used as an alerting signal prior to actual voice transmission or as a test tone when adjusting the deviation of a transmitter. The kit consists of a transistorized oscillator, a switch, the cabling required for circuit interconnections and the hardware for mounting to the control panel.

6.5 TRN6125A CLOCK KIT (OPTION 179A)

The clock kit is an electronic digital clock which utilizes a four-digit light emitting diode (LED) display. The clock can be jumpered for either 12- or 24-hour and 50 or 60 Hz operation. The digital display is mounted on the control panel at a convenient angle for viewing. Circuit components are mounted on a printed circuit board which is located behind the control panel.

6.6 HPN1000A, HPN1002A POWER SUPPLIES (OPTION L43A)

These power supplies permit operation of the station from 120-, 220-, or 240-volts, 50- or 60-Hz power and are directly interchangeable with the 120-volt, 60-Hz models. Both power supplies provide all dc power to the station and accessories as required.

6.7 TRN6182A 12 V DC KIT (OPTION L32A)

This kit allows the station to operate from a +12-volt power source ONLY. Therefore, the ac operated clock and 120-, 220-, 240-volt power supply are not compatible with this option.

6.8 HLN1043A (LOCAL CONTROL) OR HLN1044A (LOCAL-REMOTE CONTROL) MONITOR-INTERCOM KIT (OPTION L226A)

This kit permits intercommunication between the base station and a remote control console, between the base station and a desk set, or between two or more desk sets connected in parallel with the base station, without keying the transmitter. The kit consists of a transistorized amplifier, the cable for circuit interconnections, the mounting hardware, and the takeover and intercom switch (mounted on the front panel). The intercom also has a "squelch-priority" feature which disables the intercom anytime an on-frequency carrier is received by the base station receiver.

When Motorola desk sets or remote control consoles are used with the station, the VOLUME control on the Super **Consolette** base station permits independent audio level control at the control panel and desk set or a remote control console speaker(s).

6.9 HLN4012A TIME-OUT-TIMER (OPTION L11A)

The Motorola time-out timer is a "supervisory" device designed to turn off the base station transmitter after approximately one minute of continuous transmission. In addition, it provides an alert tone to the receiver audio circuit to signal the operator that the transmitter is no longer on-the-air. The time-out timer is reset when the push-to-talk switch is released, permitting transmission to be resumed for another minute. The kit consists of plug-in Time-Out Timer module installed in the radio.

6.10 TLN4427A WALL OR RACK MOUNT KIT (OPTION L273A)

This kit is available for use with all models of the Super **Consolette** base stations. The base station may be mounted in any 19-inch rack, or attached to a wall panel with this kit. When mounted, the base station is vertically oriented and is operated in the extended local or remote control mode.

6.11 HLN1045A "PL" STATION PAGING CONVERSION KIT (OPTION L63A)

The paging conversion kit is used to adapt a **Private-Line** Super **Consolette** base station for use in a selective paging system. The kit permits operation of the transmitter without **Private-Line** modulation so that paging tones from a selective paging encoder may be transmitted when desired. The transmitter may also be operated in the **Private-Line** mode when transmissions without selective paging tones are desired. The kit consists of a relay, printed circuit board, mounting bracket and interconnecting cable.

6.12 TCN1214A, TCN1215A, AND TCN1216A DC REMOTE CONTROL BOARDS (OPTIONS L139A AND L169A)

A dc remote control board is used in dc controlled remote control stations and local-remote control stations to permit the station to be remotely controlled via a two-wire telephone type line. The board contains dc transfer oscillators and switching circuits which convert dc control currents, from the remote control point, into control signals for operation of the **Consolette** base station. The board also contains all the necessary amplifier and gating circuits for control of transmit and receive audio. Model TCN1214A is used in one-frequency carrier squelch stations, Model TCN1215A is used in single frequency **Private-Line** squelch stations, and Model TCN1216A is used in two-frequency stations.

6.13 TCN1217A, TCN1218A, AND TCN1219A TONE REMOTE CONTROL BOARDS (OPTION L168A)

A tone remote control board is used in tone controlled remote control stations and local-remote control stations to permit the station to be remotely controlled via a two-wire telephone type line. The board contains tone decoder and switching circuits which converts guard and function tones, from the remote control point, into control signals for the operation of the **Consolette** base station. The board also contains all the necessary amplifier and gating circuits for control of transmit and receive audio. Model TCN1217A is used in one-frequency carrier squelch stations, Model TCN1218A is used in one-frequency **Private-Line** squelch stations, and Model TCN1219A is used in two-frequency stations.

6.14 HLN4020A **PRIVATE-LINE** TONE CODED SQUELCH ENCODER-DECODER

The **Private-Line** tone coded squelch encoder-decoder is installed in the transmitter receiver to permit private communications on crowded radio communications channels. During transmissions, the transmitter is modulated by a continuous sub-audible "PL" tone in addition to the voice modulation. The tone is generated by the encoder. During receive, the receiver audio circuits are disabled by the decoder until a proper tone code is received, therefore, signals not containing the proper tone code are not heard. In **Private-Line** systems, a switch is required to disable the squelch so that the channel can be monitored to be sure it is clear before initiating a transmission.

6.15 HLN4011A **PRIVATE-LINE** DIGITAL CODED SQUELCH ENCODER-DECODER

The **Private-Line** digital coded squelch encoder-decoder is installed in the transmitter-receiver to permit private communications over crowded radio communications channels. The digital encoder-decoder functions essentially the same as the tone encoder-decoder except that is uses digital codes which provide a more secure system. During transmissions, the transmitter is modulated by a continuous sub-audible 23-bit binary code in addition to the voice modulation. During receive, the receiver audio circuits are disabled by the decoder until a proper binary code is received, therefore, signals not containing the proper binary code are not heard. In **Private-Line** systems, a switch is required to disable the squelch so that the channel can be monitored to be sure it is clear before initiaiting a transmission.

6.16 TLN1374B EMERGENCY POWER REVERTING KIT (OPTION L28A)

This kit permits operation of the base station from either a 120-volt ac primary power source or a 12-volt dc power source. The emergency power reverting kit is used in applications where communications must remain operational during ac power failures. In the event of a 120-volt ac power failure, instantaneous automatic switchover to battery operation is provided. Operation on emergency power is indicated by the green power-on indicator blinking. Included in the kit is a full time trickle charging circuit for the standby 12-volt battery, functional with HPN1001A or HPN1002A power supplies only.

7. FUNCTIONAL DESCRIPTION

7.1 GENERAL

The overall functional interconnect diagrams for Super **Consolette** base stations are shown in Figure 6 through Figure 8. Figure 6 shows a local control station, Figure 7 shows a local/remote control station, and Figure 8 shows a remote control station. Figure 9 is the audio path functional diagram of a local/remote control station.

7.2 POWER APPLICATION

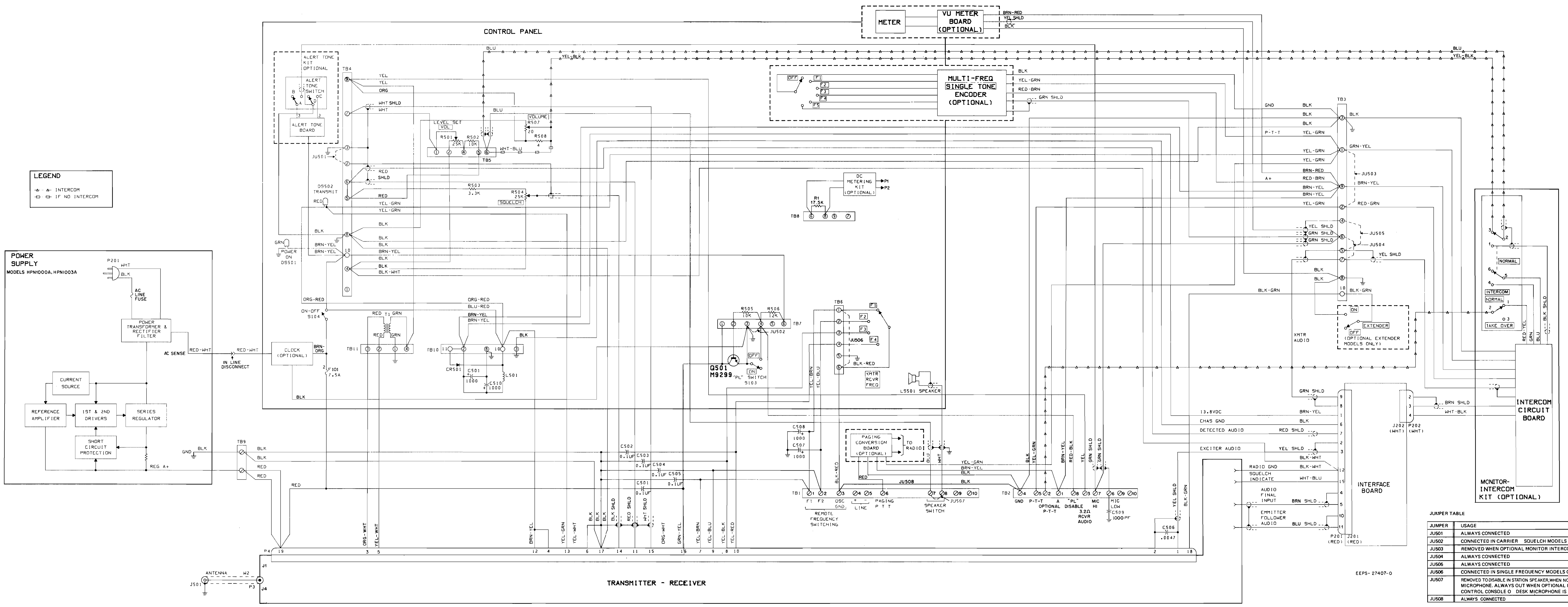
Primary input voltage (120 volts ac) is connected to the station power supply through the line cord. The power supply is activated when the power cord is plugged into an ac outlet. The regulated high current A+ line to operate the transmitter high power stages is routed to the transmitter via the transmitter-receiver connector. When the on-off switch (part of the OFF-VOLUME control) is turned on, the green (power-on) indicator lamp on the control panel lights and the low current dc output from the power supply is applied to the transmitter-receiver.

7.3 FREQUENCY SELECTION (MULTI-FREQUENCY MODELS ONLY)

Multi-frequency station incorporate up to four frequencies for local control stations, or a maximum of two frequencies for remote control stations. In local control stations, the appropriate transmit and receive oscillators are activated when their ground path is completed by the frequency selector switch on the control panel. In remote control stations, the oscillators are activated when the proper function tone or dc current is received from the remote control unit.

7.4 **PRIVATE-LINE** DISABLE (**PRIVATE LINE** CODED SQUELCH MODELS ONLY)

When the **Private-Line** switch on the control panel is placed in the OFF position, a ground is removed from the receiver audio switch circuit permitting the noise-operated squelch circuit to operate. All on-frequency signals with or without **Private-Line** coding will now be heard.



JUMPER TABLE

JUMPER	USAGE	LOCATION
JU501	ALWAYS CONNECTED	TB4
JU502	CONNECTED IN CARRIER SQUELCH MODELS ONLY	TB7
JU503	REMOVED WHEN OPTIONAL MONITOR INTERCOM IS USED	TB3
JU504	ALWAYS CONNECTED	TB3
JU505	ALWAYS CONNECTED	TB3
JU506	CONNECTED IN SINGLE FREQUENCY MODELS ONLY	TB6
JU507	REMOVED TO DISABLE IN STATION SPEAKER, WHEN NOT USING DESK MICROPHONE. ALWAYS OUT WHEN OPTIONAL REMOTE CONTROL CONSOLE O DESK MICROPHONE IS USED	TB1
JU508	ALWAYS CONNECTED	TB1–TB2

Figure 6.
Local Control Station
Functional Interconnect Diagram
Motorola No. EEPS-27407-O
2-24-84 GGI

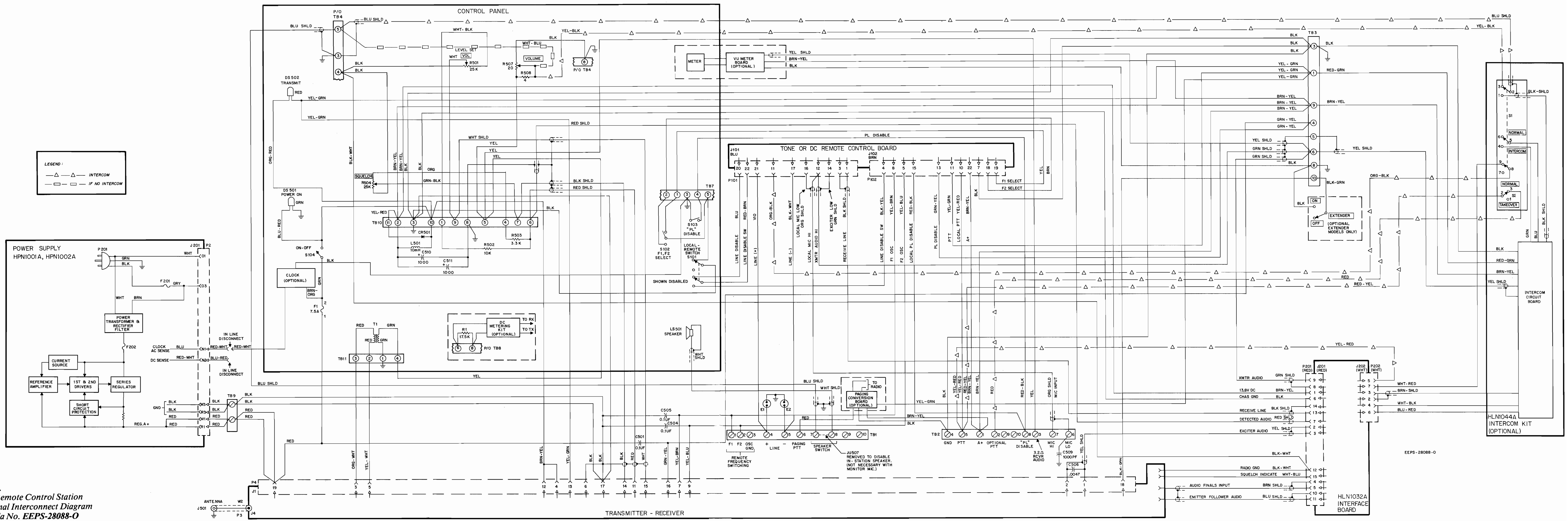


Figure 7.
Local/Remote Control Station
Functional Interconnect Diagram
Motorola No. **EEPS-28088-O**
2-24-84 GGI

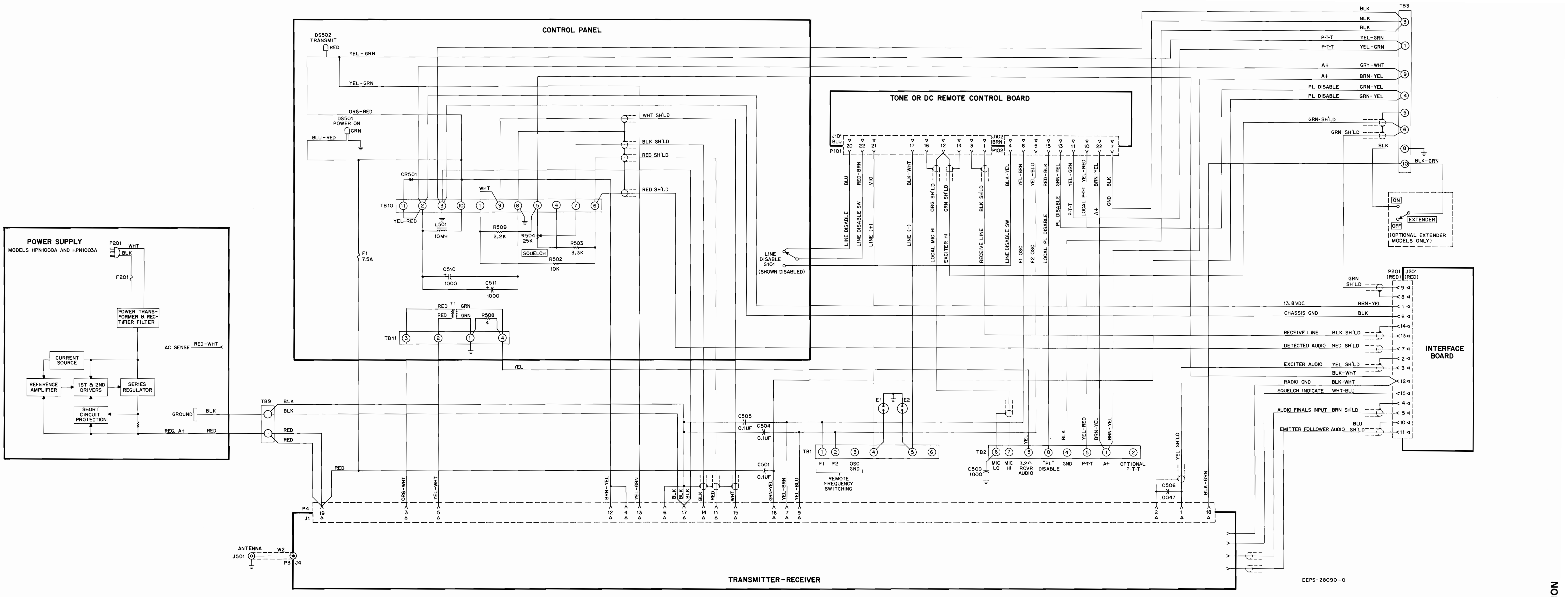


Figure 8.
Remote Control Station
Functional Interconnect Diagram
Motorola No. ***EEPS-28090-O***
2-24-84 GGI

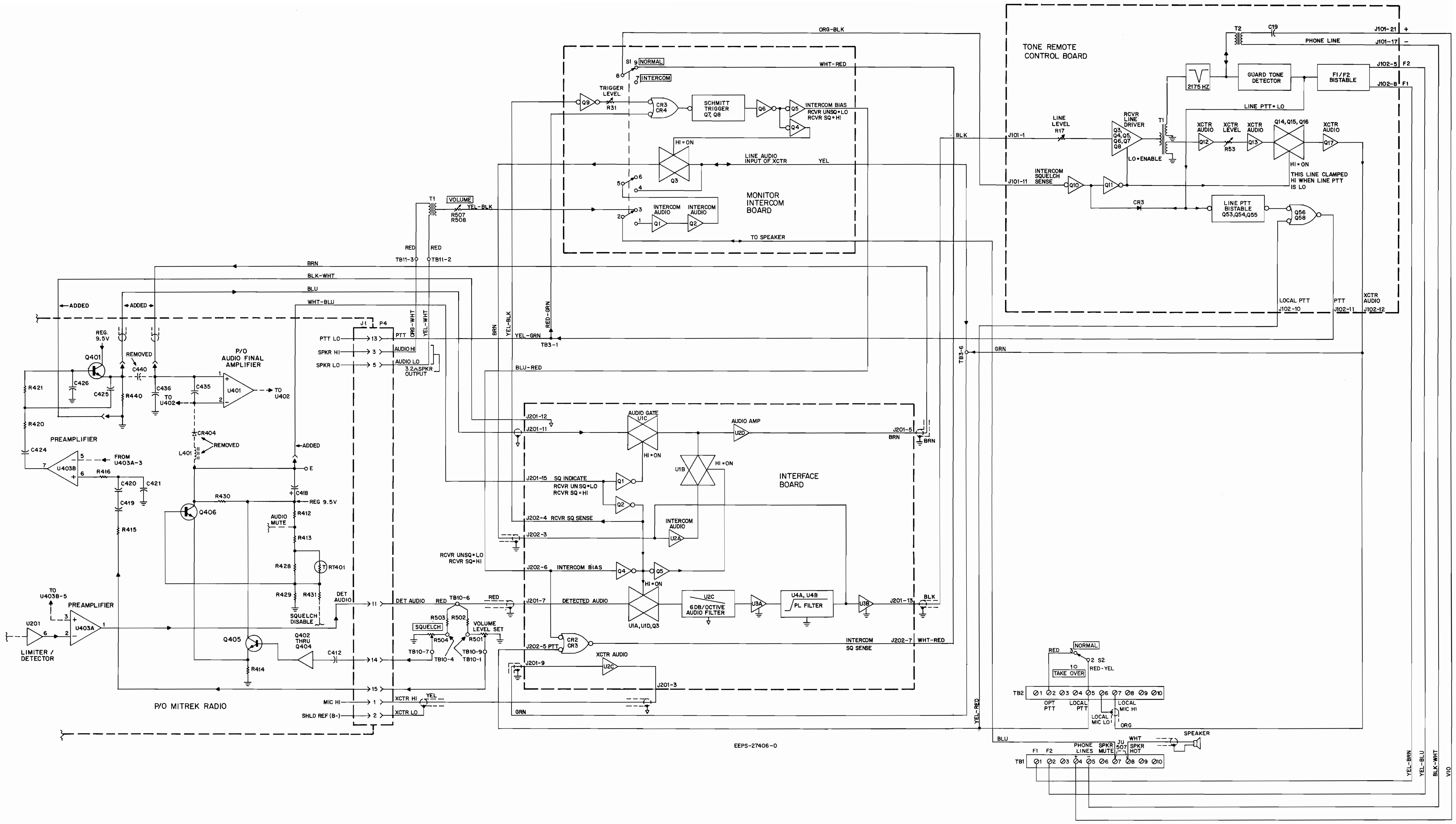


Figure 9.
Local/Remote Control Station
Audio Path Functional Diagram
Motorola No. ***EEPS-27406-O***
2-24-84 GGI

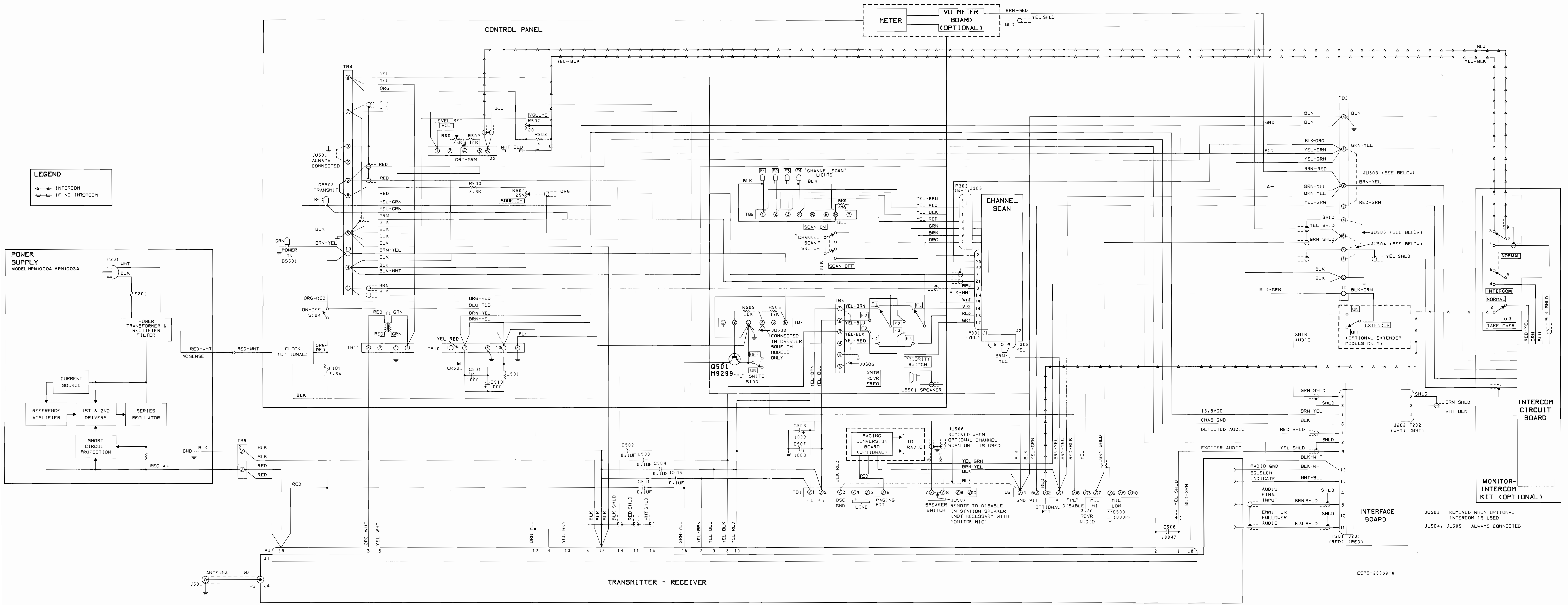


Figure 10.
Local Control Station with Optional "Channel Scan" Monitor Functional Interconnect Diagram
Motorola No. EEPS-28089-O

2-24-84 GGI

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INSTALLATION

IMPORTANT

The operation of the transmitter in this radio set is covered by governmental rules and regulations. Several provisions of Federal Communications Commission (FCC) rules are briefly summarized in the following paragraphs. For complete information on FCC rules (or for rules in other countries), refer to the most current applicable regulations.

- Transmitter frequency and deviation must be checked and adjusted, if necessary, before a transmitter is placed in service. While it is not required, it is recommended that the transmitter frequency and deviation be checked at the end of the first and third months of service and one year after installation. This will aid the maintenance technician in detecting frequency changes due to crystal aging. After this initial period, the frequency and deviation should be checked periodically to be sure that the transmitter stays within specifications.

- The rf power output of a transmitter shall be no more than required for satisfactory technical operation considering the area to be covered and the local conditions.

- Radio transmitters may be tuned or adjusted only by a person holding a valid first or second class commercial radiotelephone operator's license or by personnel working directly under his immediate supervision.

REMEMBER

The efficiency of the equipment depends upon a good installation.

1. INSPECTION

Inspect the equipment thoroughly as soon as possible after delivery. If any part of the equipment has been damaged in transit, report the extent of damage to the transportation company immediately.

2. ANTENNA AND TRANSMISSION LINE CONSIDERATIONS

The antenna and transmission line kit are not included with the base station since each installation requires special attention. Consult your nearest Motorola representative for antenna and transmission line requirements. Installation of the antenna should be made prior to the installation of the base station. Follow the instructions included with the antenna and transmission line kits.

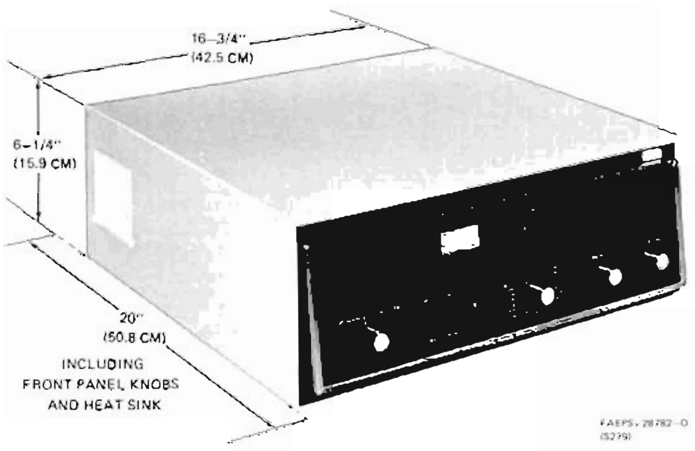

Figure 1. Cabinet Dimensional Details

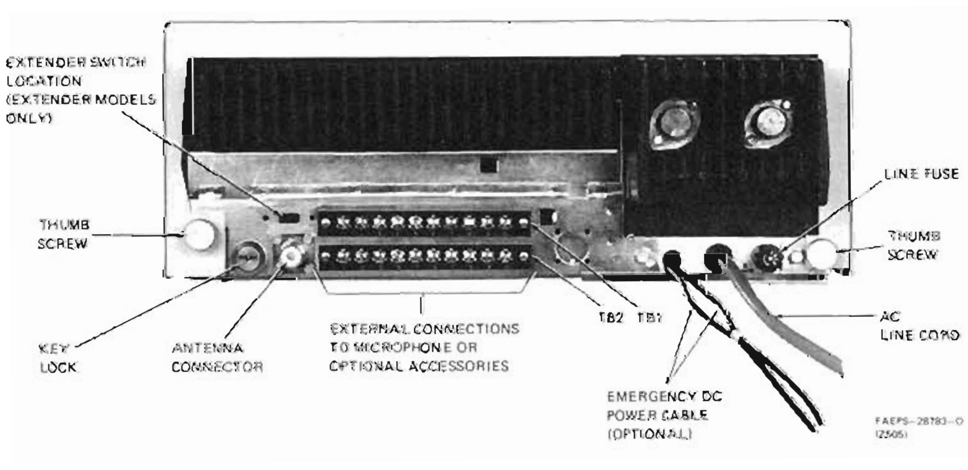

Figure 2. Cabinet Rear View Detail

3. INSTALLATION OF CABINET

3.1 UNPACKING

Step 1. Remove the foam blocks from either side of the station cabinet.

Step 2. Remove the envelope containing the keys from the front panel.

Step 3. Remove the accessories from the shipping carton.

3.2 LOCATION

The cabinet should be located on a solid, level surface convenient to the ac power source and the transmission line. See Figure 1 and plan the installation to allow space for ventilation at the sides and rear of the cabinet. The transmission line should be kept as short as possible to minimize line losses.

The cabinet of the local control model base station should be located at a level where the controls on the panel are convenient to the operator.

3.3 SUPER **CONSOLETTE** BASE STATION EXTERNAL CONNECTION TERMINAL FUNCTIONS

Terminal function identification is given in Table 1.

Table 1. External Connection Terminal Functions

Function	Super **Consolette** Base Station TB#
Auxiliary A + Out	TB2-1
Desk Set PTT	TB2-2
3.2-Ohm Audio HI	TB2-3
Ground	TB2-4
MIC PTT	TB2-5
MIC LO or Intercom Audio Shield	TB2-6
MIC HI or Intercom Audio HI	TB2-7
PL Disable	TB2-8
F1 Frequency Switching (local control)	TB1-1
F2 Frequency Switching (local control)	TB1-2
Oscillator Ground	TB1-3
Remote Line (+)	TB1-4
Remote Line (-)	TB1-5
Paging Option PTT	TB1-6
3.2 Ohm Audio HI	TB1-7
3.2 Ohm Audio Mute	TB1-8

INSTALLATION REQUIREMENT

If the **Consolette** base station is equipped with monitor-intercom and a desk microphone, jumper JU1 in the microphone must be cut. The jumper must be cut to prevent acoustical feedback during standby operation. Refer to the microphone section of the manual for location of jumper JU1.

3.4 DESK MICROPHONE CONNECTIONS

Connect the desk microphone as shown in Table 2.

Table 2. Microphone Connections

Function	Super **Consolette** Base Station TB#
GND ~~Shield~~ Black	TB2-4
PTT green	TB2-5
MIC LO Shield	TB2-6
MIC HI Brown	TB2-7
"PL" Disable white	TB2-8
3-Ohm Audio HI	TB1-7
3-Ohm Audio Mute	TB1-8

3.5 DESK SET CONNECTION

When using a desk set and no local microphone with the **Consolette** base station remove the jumper between TB1-7 and -8. This disables the station speaker. Connect the desk set as shown in Table 3.

Table 3. Local Control Desk Set Connections

Control Unit Terminal #	Function	Super **Consolette** Base Station TB#
	Stations Without Intercom Kit	
T1	Desk Set MIC HI	TB2-7
T4	Desk Set MIC LO	TB2-6
T2	Desk Set PTT	TB2-5
T7	Ground	TB2-4
T6	3-Ohm Audio HI	TB2-3
T8	PL Disable	TB2-8
T9*	A +	TB2-1
	Stations With Intercom Kit	
T1	Desk Set Mic HI	TB2-7
T4	Desk Set Mic LO	TB2-6
T2	Desk Set PTT	TB2-2
T7	Ground	TB2-4
T6	3-Ohm Audio HI	TB2-3
T8	PL Disable	TB2-8
T9*	A +	TB2-1

* Wallmount Local Control Unit only.

NOTE

For multiple control unit connections to a Super **Consolette** base station without the intercom kit, refer to the TLN1218B Junction Box instruction manual.

3.6 REMOTE CONTROL CONNECTIONS

3.6.1 General

Two-wire telephone line is used to connect the remote control unit to the Super **Consolette** base station in remote control stations. Connect the telephone line to TB1-4 (+) and TB1-5(-). The jumper between TB1-7 and -8 must be removed to disable the station speaker. Audio lines used for remote control operation must meet the requirements given in the following paragraphs. When using leased telephone lines, the characteristics of the lines must be checked with the company providing the service to assure that they meet these requirements.

3.6.2 Tone Remote Audio and Control Line Requirements

Line requirements for tone remote control operation are as follows:

Frequency Response: 300 to 3000 Hz
Frequency Translation Error: ± 5 Hz max.
Impedance: 600-ohm balanced line
Signal-to-Noise: 35 dB min.

Maximum Line Loss

Phone-Company Specified Maximum Input	Maximum Phone Line Loss Usable with Remotely-Controlled Radio
+ 8 vu (14 dBm)	32 dB
0 vu (6 dBm)	24 dB
-8 vu (-2 dBm)	16 dB

3.6.3 DC Remote Control Audio and Control Line Requirements

Line requirements for dc remote control operation are as follows:

Audio Line Requirements

1. Frequency Response: 300 to 3000 Hz.
2. Impedance: 600-ohm balanced line.

DC Line Requirements

1. DC resistance 0 to 8000 ohms.
2. Must have dc continuity.

3.7 ANTENNA CONNECTION

Connect the antenna lead-in connector to the antenna connector on the back of the **Consolette** station.

3.8 AC POWER CONNECTION

3.8.1 Using HPN1001A or HPN1003A Power Supply

A three-wire ac line cord is supplied with the power supply. Connect the line cord to a 120 V, 60 Hz ac outlet.

3.8.2 Using Optional HPN1000A or HPN1002A Power Supply

These optional power supplies are used for 120-, 220-, 240-volt, 50 or 60 Hz power sources. The three-wire ac line cord that is provided with the station is for use with a 120-volt power source ONLY -- simply connect the line cord to an ac outlet. For 220/240 V ac operation, the line cord plug should be removed and discarded and a second line fuse of the same type as F1 *must* be field installed in the white ac power line lead. Install the fuse in accordance with applicable local electrical codes. Refer to Figure 3 and Table 4 (for HPN1000A) or Figure 4 and Table 5 (for HPN1002A) for proper connections to the transformer terminal board.

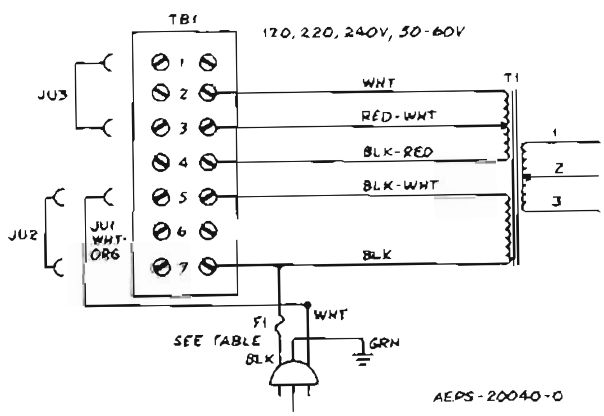

Figure 3. Transformer Tap Connections for HPN1000A Power Supply

Table 4. Transformer Tap Connections for HPN1000A Power Supply

Power Source	Connect	From	To	Fuse (F1)
120 V ac	JU1	—	TB1-5	10A
	JU2	TB1-4	TB1-7	
	JU3	TB1-2	TB1-5	
220 V ac	JU1	—	TB1-3	5A*
	JU2	TB1-4	TB1-5	
240 V ac	JU1	—	TB1-2	5A*
	JU2	TB1-4	TB1-5	

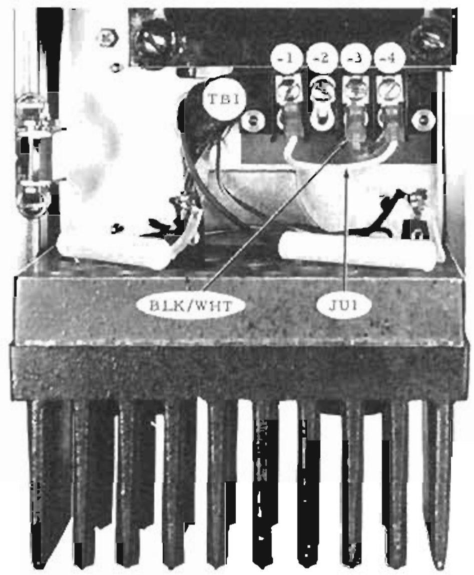

Figure 4. Transformer Tap Connections for HPN1002A Power Supply

Table 5. Transformer Tap Connections for HPN1002A Power Supply

Power Source	Connections	
	JU1	Blk/Wht Lead
120 V ac	Between TB1-1 & -4	To TB1-3
220 V ac	Not Used	To TB1-2
240 V ac	Not Used	To TB1-1

4. INITIAL CHECKS AND ADJUSTMENTS

4.1 POWER SUPPLY CHECK

The power supply requires no adjustment, however, the output should be checked for approximately 13.5 V dc at the time of installation. When using an optional power supply, be sure the transformer tap connections are correct for the specific power source voltage being used as described previously.

4.2 TRANSMITTER-RECEIVER CHECK

The transmitter and receiver were accurately aligned at the factory before the station was shipped. However, the equipment should be checked before actual operation since it may have been mishandled during transit. FCC regulations also require that transmitter frequency, power and deviation be checked before the station is placed in operation. Refer to the transmitter-receiver instruction section of the appropriate **Mitrek** Mobile instruction manual for these check procedures.

4.3 PRE-OPERATIONAL ADJUSTMENTS

4.3.1 General Information

Most telephone companies limit the maximum signal power which they will allow on their lines. This maximum is specified with respect to a specified Test Level Point (TLP) at full system deviation (±5 kHz). The maximum signal power usually specified (in the U.S.A.) is -13 dB average below the TLP. The -13 dB average is defined as the peak to average ratio of a speech signal over a 3-second period. For purposes of these instructions, the TLP is assumed to be 0 dBm for voice and -16 dBm for multiplex unless otherwise specified.

Since it is difficult (if not impossible) to measure speech power, a test tone (sine wave) is used for setting line levels. A 1000 Hz tone set for 60% full system deviation or ±3 kHz is recommended for setting the line level.

4.3.2 DC Line Current Levels

When the dc control line is initially connected, it must be tested to assure that its loop resistance is low enough to allow sufficient current for remote operation. Use the following test procedure:

Step 1. Connect a dc millimeter in series with the dc control line.

Step 2. Press the push-to-talk switch at the remote control console.

Step 3. The current must be at least +5.5 mA to key the transmitter; at least +10 mA for two-frequency transmitters. Check the current polarity and note whether the station is actually keyed; reverse the polarity of the line connections if necessary. Adjust the remote control console for F1 line current until +5.5 mA is achieved. For a two-frequency transmitter, adjust the remote control console for F2 line current of +10 to 12 mA. If the loop resistance is too high, the line current with the console set for maximum current will not key the transmitter.

Adjust the line current for **Private-Line** disable at the remote control console for -2.5 mA, if a **Private-Line** model is being adjusted.

4.3.3 Control Tone Levels

The control tone levels for the remotely controlled functions are adjusted at the remote control console. No additional adjustments are required.

INSTALLATION

4.3.4 Audio Level Setting

4.3.4.1 General

A local speaker at the station may be used for testing and level settings. The speaker in a Motorola portable test set may be used by connecting the test set to the receiver test receptacle. The station VOLUME control sets the audio level at the local speaker only.

NOTE

Exciter audio should not be injected at transmitter test socket.

Private-Line receivers must be PL disabled during adjustments with the PL DISABLE switch.

NOTE

When setting line audio levels with a local-remote option station, be sure that the local audio level is set first (typically 6-watts with the volume control on the front of the station at the minimum level).

4.3.4.2 IDC Level Setting Procedure

Connect audio oscillator and ac voltmeter to microphone input TB2-6, -7. Apply 100 Hz test tone at 1.0 V rms. Adjust IDC control for a maximum deviation of 4.8 kHz, including PL. Reduce test tone level until deviation is 3 kHz. Record test tone level. This is the exciter audio level, which should be approximately the sensitivity value stamped on the exciter.

4.3.4.3 Remote Level Setting Procedure

Determine the maximum allowable audio level permitted on the lines and set line audio levels to this amplitude. The lines used to carry audio have an ac impedance of 600-ohms. The amplitude of signals is most conveniently measured in dBm. Zero dBm is equal to 1 milliwatt across 600-ohms. Most audio voltmeter, such as the Motorola Transistorized AC Voltmeter, are calibrated to read directly in dBm when measuring across a 600-ohm impedance. Never use a volt-ohm-meter or a multimeter.

Step 1. Apply a 1000 Hz test tone at the remote control console which will drive the amplifier into compression. Adjust the output of the remote control console for maximum allowable audio level on the transmit audio line as it leaves the remote control console. If the level at TB1-4 and TB1-5 is above 0 dBm remove JU2 on the remote control board.

Step 2. With tone remote remote control or dc remote control the exciter level should be measured at TB2-7 and TB2-4 (GND). Adjust the XCTR LEVEL control (on the remote control board) so the exciter audio input equals the value stamped on the exciter (modulator sensitivity plus 3 dB or approximately ± 4 kHz transmitter deviation).

Step 3. Remote the transmit audio tone.

Step 4. Set the receiver SQUELCH control for squelch threshold.

Step 5. Inject a 1000 uV carrier frequency signal at the antenna input of the receiver. Modulate the signal with a 1000 Hz tone at ± 3 kHz deviation.

Step 6. Adjust the VOLUME LEVEL SET control (behind the front panel) for 4.4 V rms (rated power output) at the local audio terminal (TB2-3) at the rear of the station.

Step 7. With the line terminals connected to the 600-ohm line or a 600-ohm load, adjust the LINE LEVEL control on the remote control board for 4.4 dB below the specified TLP as measured with an ac voltmeter across the line terminals (TB1-4 and TB1-5 at the rear of the station).

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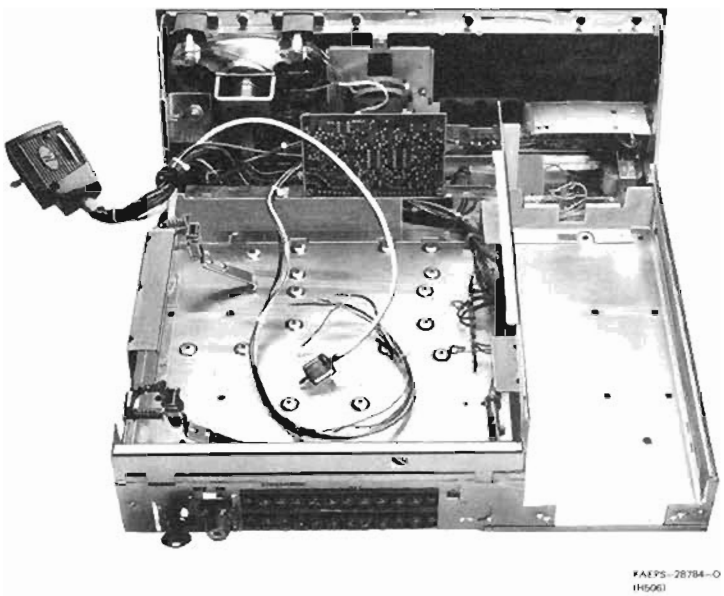
CONTROL PANEL AND CHASSIS

MODEL HLN4135A
HLN4136A
HLN4137A



FAEPS-28784-O
(H506)

1. DESCRIPTION

The control panel and chassis mount the transmitter-receiver unit and power supply of the **Mitrek** Super **Consolette** base station. The compact design of the control panel and chassis requires a minimum of space for installation. Three chassis models are available — the specific model used depends on system applications. Refer to the appropriate **Mitrek** Mobile radio instruction manual for a description of the transmitter-receiver unit itself. Also, see the Description section, under the Station Data tab, of this manual for specific modifications made to the transmitter-receiver unit.

- HLN4135A — used in local control systems. The control panel on the front of this unit contains all the controls necessary (including front panel mounted accessories) for operation of the station.
- HLN4136A — used in remote control systems. The control panel on the front of this unit is blank except for the power-on and transmit indicators.
- HLN4137A — used in local-remote control systems. This model may be controlled either locally from the control panel or remotely from a remote control unit, but not from both locations at the same time. A switch located on the front panel selects either local or local-remote control.

The rear of each chassis is equipped with an antenna connector, two terminal boards for external connections, a key lock, and (on 29.7-50 MHz 'extender' models only) an 'extender' switch. All external connections are made at the rear of the chassis. Complete chassis wiring for each model is shown in diagrams at the end of this section.

2. MAINTENANCE

2.1 GENERAL

To facilitate maintenance, the station cabinet is easily removed from the chassis by unlocking the key lock and loosening two thumbscrews at the rear of the cabinet. Then, the cabinet housing is pulled back and lifted clear of the chassis.

The transmitter-receiver unit is secured to the chassis by two quick-release snap fasteners which permit rapid removal for maintenance and access to optional accessory printed circuit boards mounted underneath.

2.2 TRANSMITTER-RECEIVER REMOVAL AND INSTALLATION

Remove the cabinet housing as described previously and then remove the transmitter-receiver unit as follows:

NOTE

If the transmitter-receiver unit is being removed to gain access to other station circuitry, then omit Steps 1 through 3, leaving the cables attached as shown in Figure 1.

Step 1. Disconnect the 19-pin plug (P4) from its receptacle (J1) on the front of the transmitter-receiver unit by turning the locking screw counterclockwise and pulling the plug.

Step 2. Disconnect the rf cable connector (P3) from its receptacle (J4) on the front of the transmitter-receiver unit.

Step 3. Remove the transmitter and receiver metering cable plugs, if metering facilities are included in the station. Unplug the four-wire cable assembly, with push-on pins, from the receiver audio and squelch section of the transmitter-receiver unit. Be sure to note the location of these leads to ensure that they will be replaced correctly. (Refer to the Description section under the STATION DATA tab of this manual.)

Step 4. Release the two quick-release fasteners from the transmitter-receiver unit, lift the fastener side of the unit and pull it away from the retaining tab.

Step 5. When re-installing the transmitter-receiver unit, insert it under the tip of the retaining wall tab from the right side of the station chassis, as shown in Figure 2. Then, lower the side of the unit until the chassis mounting tab engages the slot on the bottom of the unit. See inset in Figure 2 for correct orientation.

Step 6. Complete the re-installation by reversing the procedures of Steps 1 through 4 above.

2.3 POWER SUPPLY REMOVAL

Step 1. Disconnect the two power supply leads from TB9 or remove the power supply cable connector from J201 on the top of the power supply chassis.

Step 2. Four screws secure the power supply chassis to the base station bottom plate. Remove two screws from the top of the power supply chassis near the front of the unit and two screws at the back of the base station below the power supply heat radiator.

Step 3. Lift the power supply chassis, with ac line cord attached, straight up and away from the control panel and chassis.

2.4 CONTROL PANEL ACCESS

Step 1. Remove two screws on each side of the control panel.

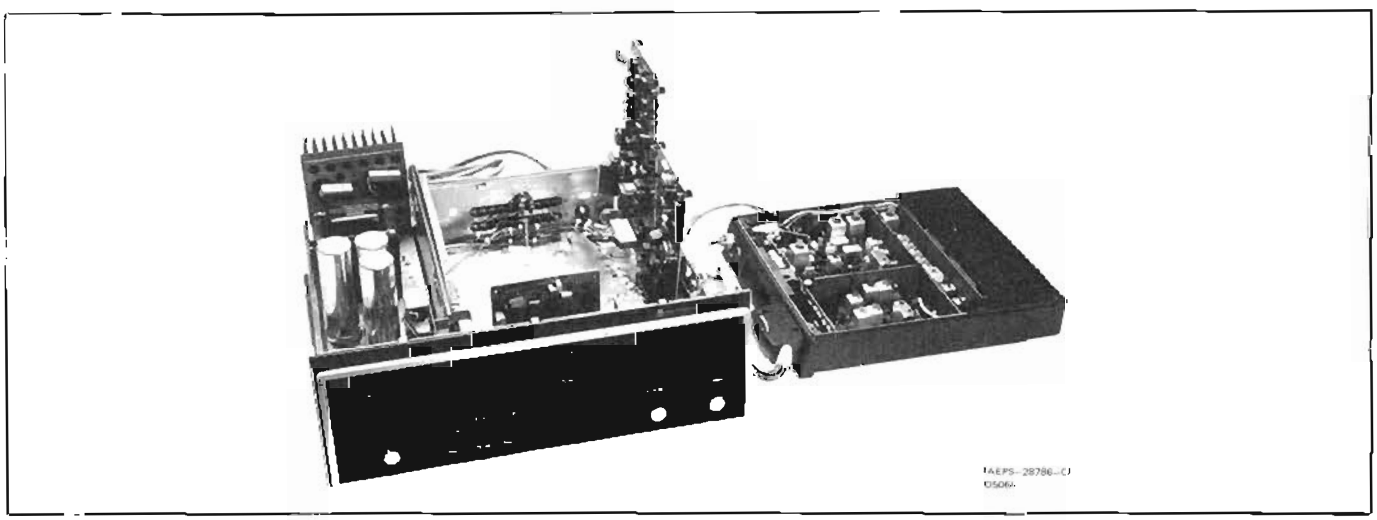


Figure 1. Transmitter-Receiver Unit Temporary Removal (Cables Attached)

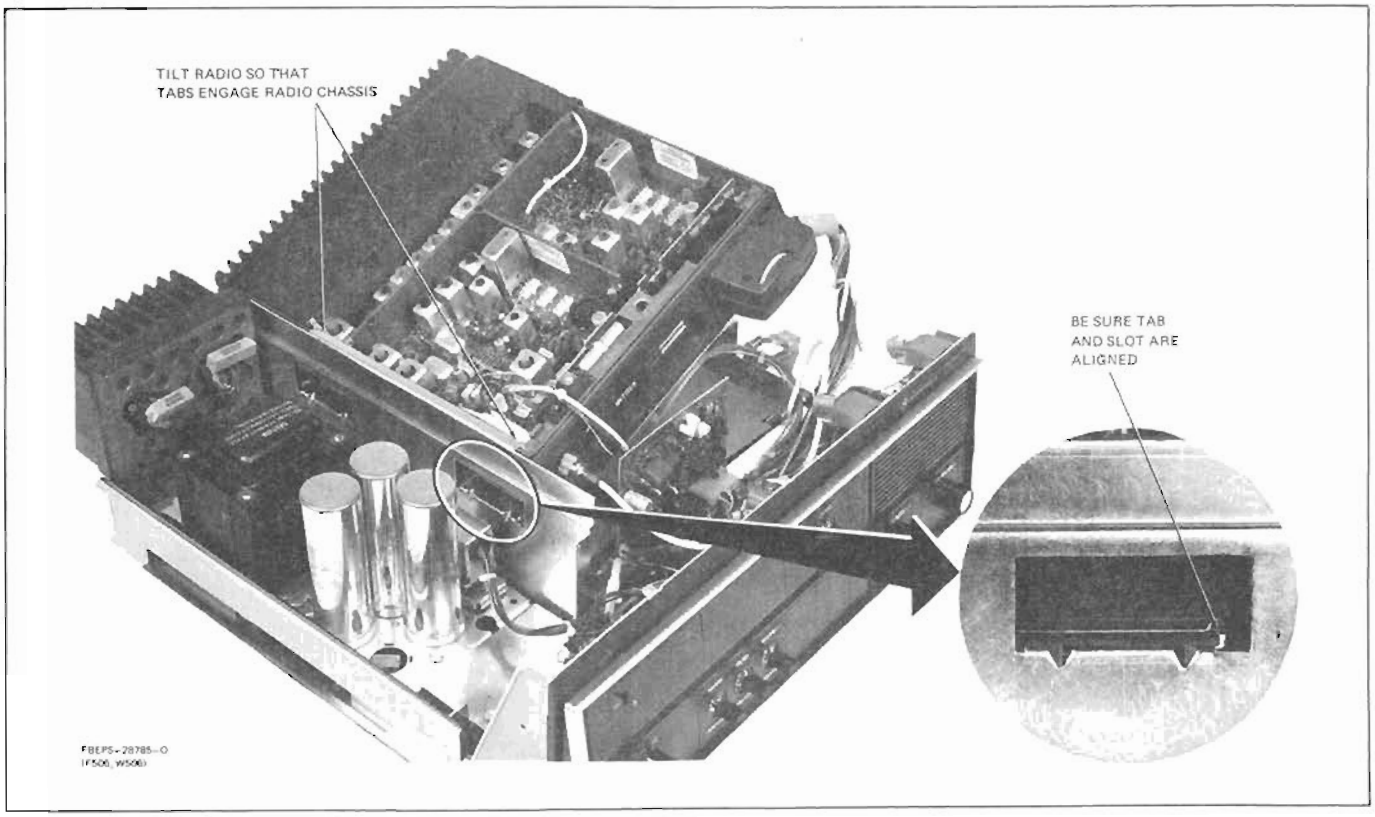


Figure 2. Transmitter-Receiver Unit Installation Detail

Step 2. Fold the control panel down and forward, away from the chassis, for access to control panel components.

2.5 FREQUENCY SELECTOR SWITCH REPLACEMENT

Multi-frequency stations have a mechanical stop on the frequency selector switch. This stop is set for two- or four-frequency operation as shipped from the factory. If the selector switch is replaced, the mechanical stop must be properly set. Refer to Figure 3 for proper orientation of the switch and positioning of the mechanical stop.

2.6 TERMINAL STRIP LOCATION

Terminal strip locations are as shown in Figure 4.

2.7 WIRING DIAGRAMS

Wiring diagrams for the various configurations of **Mitrek** Super **Consolette** base stations are shown in Figures 5, 6, and 7. Figure 5 shows a local control station, Figure 6 shows a local remote control station, and Figure 7 shows a remote control station.

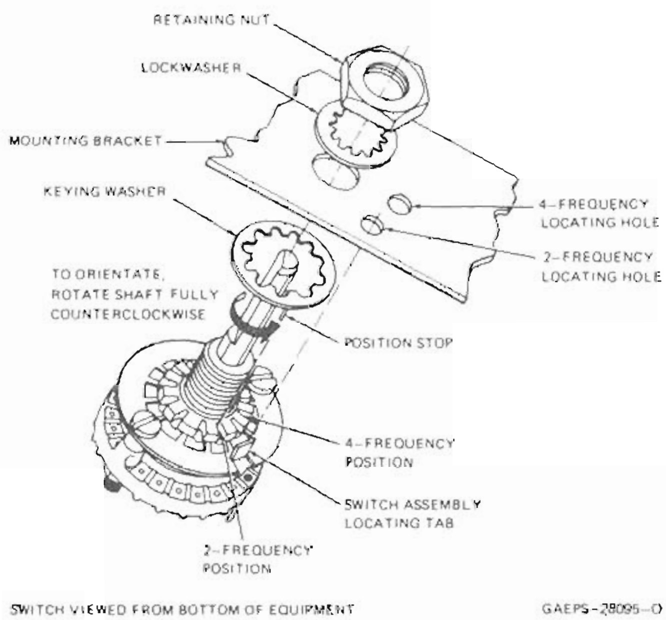


Figure 3. Frequency Switch Stop Adjustment

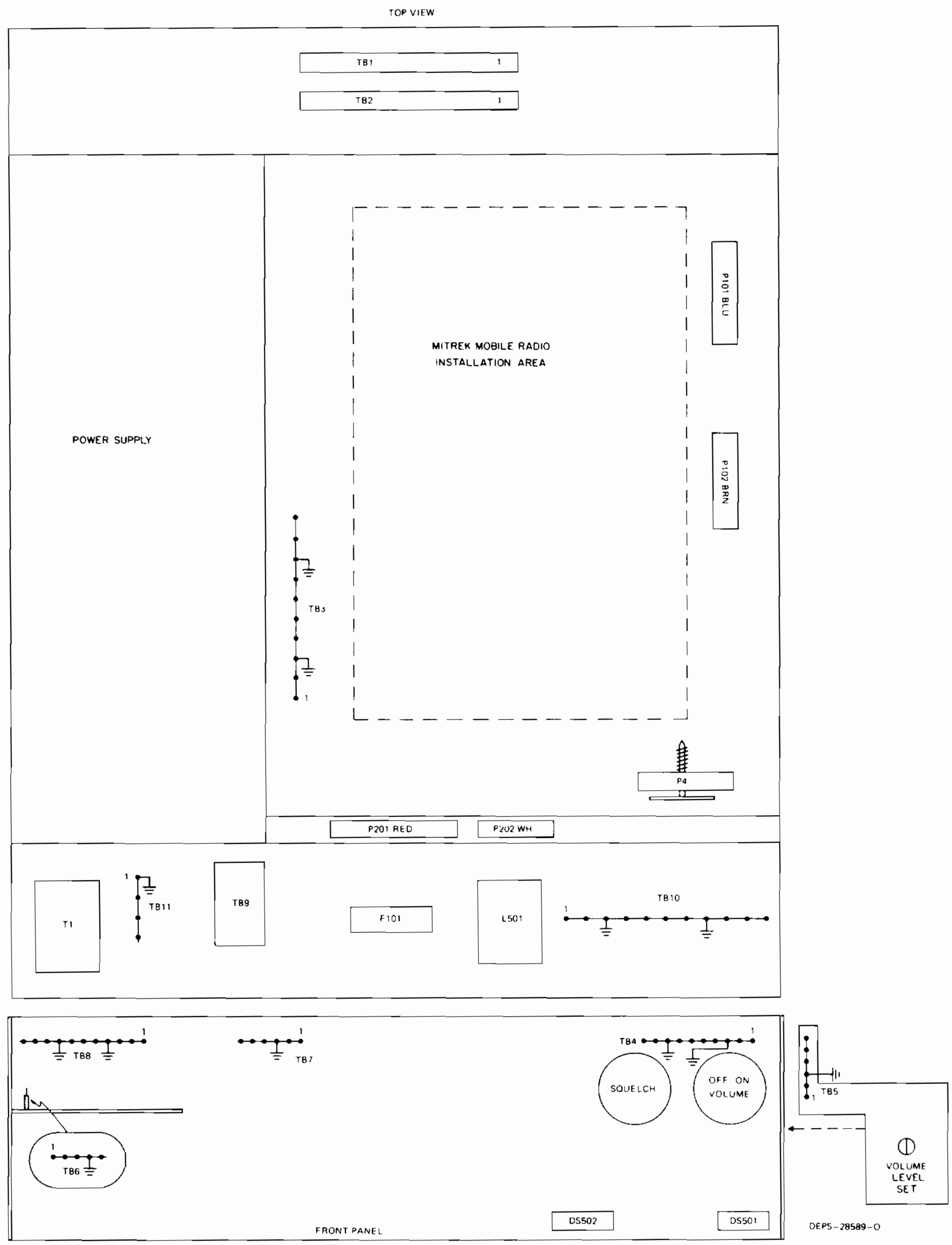
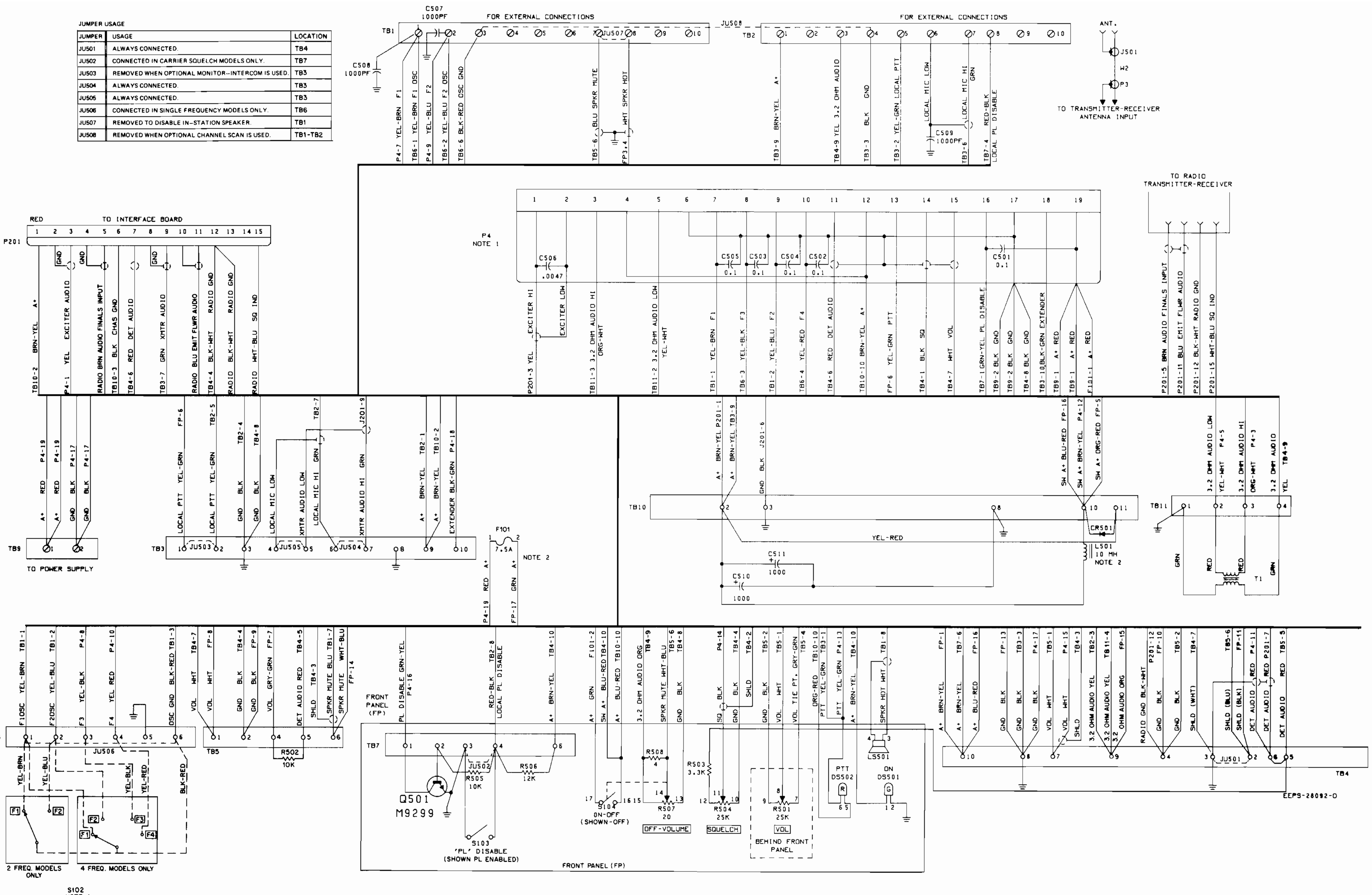


Figure 4. Station Layout Detail

JUMPER USAGE

JUMPER	USAGE	LOCATION
JU501	ALWAYS CONNECTED.	TB4
JU502	CONNECTED IN CARRIER SQUELCH MODELS ONLY.	TB7
JU503	REMOVED WHEN OPTIONAL MONITOR–INTERCOM IS USED.	TB3
JU504	ALWAYS CONNECTED.	TB3
JU505	ALWAYS CONNECTED.	TB3
JU506	CONNECTED IN SINGLE FREQUENCY MODELS ONLY.	TB6
JU507	REMOVED TO DISABLE IN–STATION SPEAKER.	TB1
JU508	REMOVED WHEN OPTIONAL CHANNEL SCAN IS USED.	TB1-TB2



NOTES
1. C501 THROUGH C506 ARE LOCATED WITHIN P4.
2. MOUNTED ON THE CHASSIS
3. FP INDICATES WIRING TO COMPONENTS LOCATED ON THE FRONT PANEL.
4. THE TRN6153A MULTI-FREQUENCY SWITCH KIT IS USED IN 2 AND 4 FREQUENCY MODELS WITHOUT REMOTE OPTIONS. THE TRN6183A SWITCH KIT IS USED IN 2 FREQUENCY MODELS WITH REMOTE OPTIONS.

Figure 5.
Local Control Chassis
Wiring Diagram
Motorola No. EEPS-28092-O
2-24-84 GGI

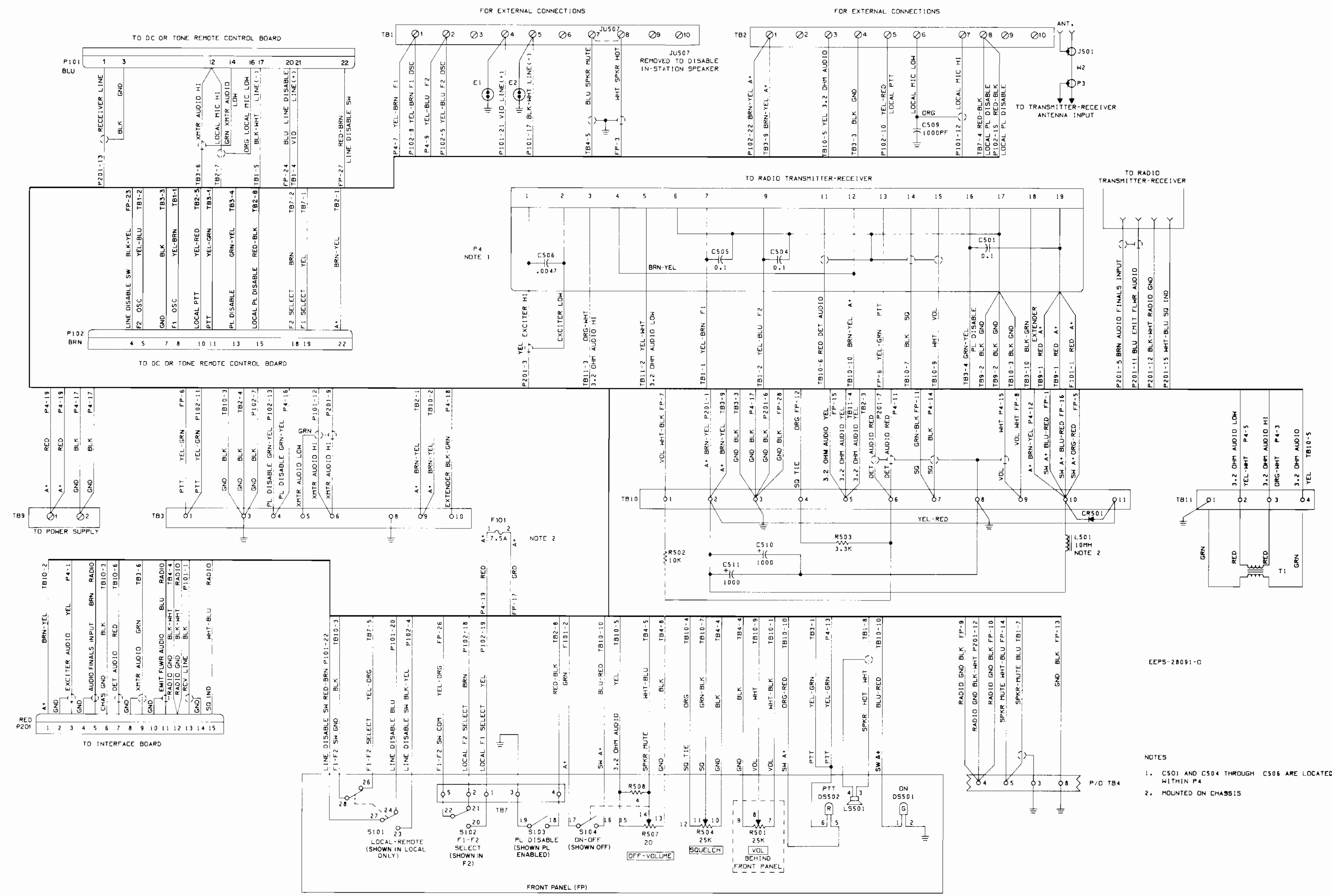
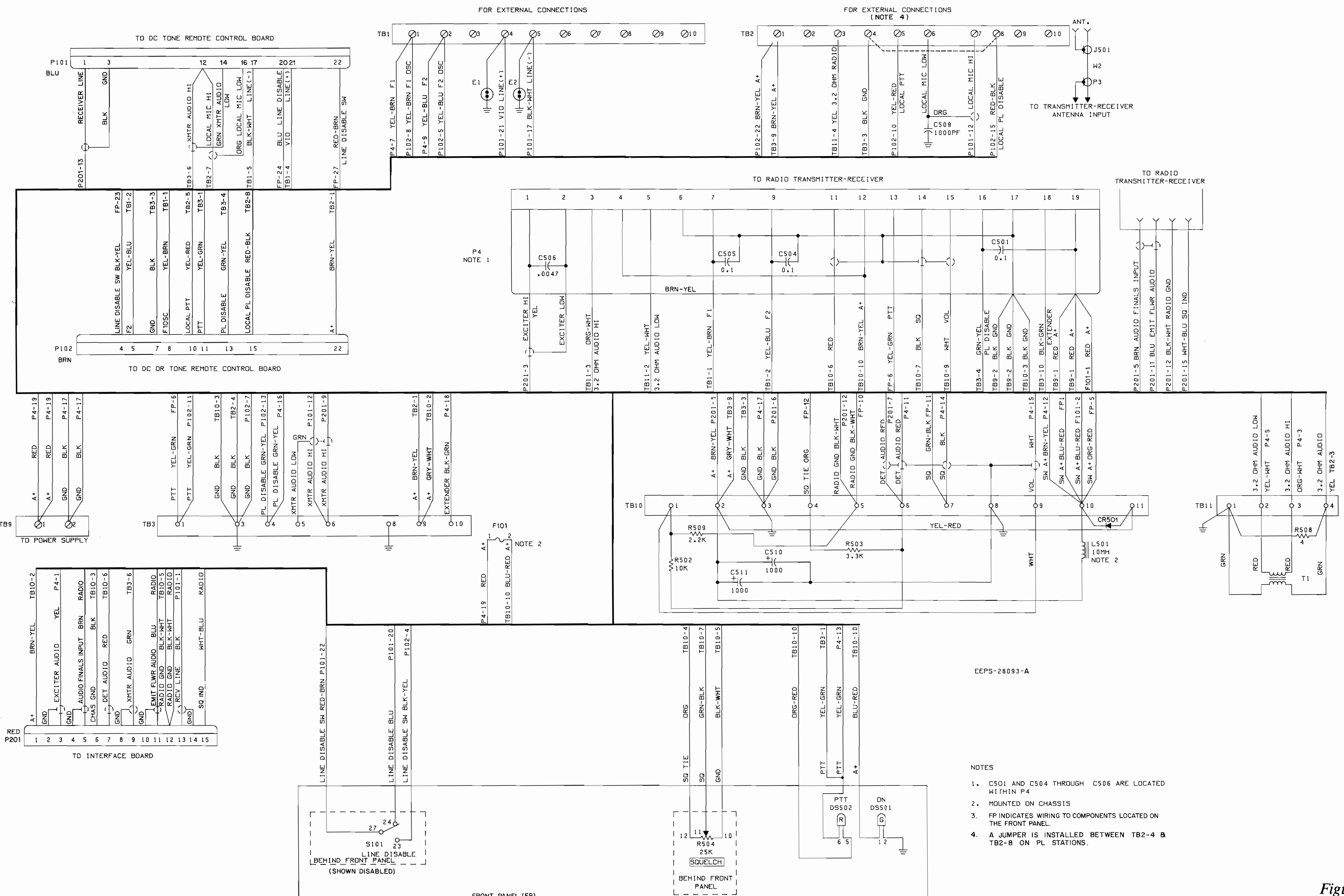


Figure 6.
Local Remote Control Chassis
Wiring Diagram
Motorola No. ***EEPS-28091-O***
2-24-84 GGI



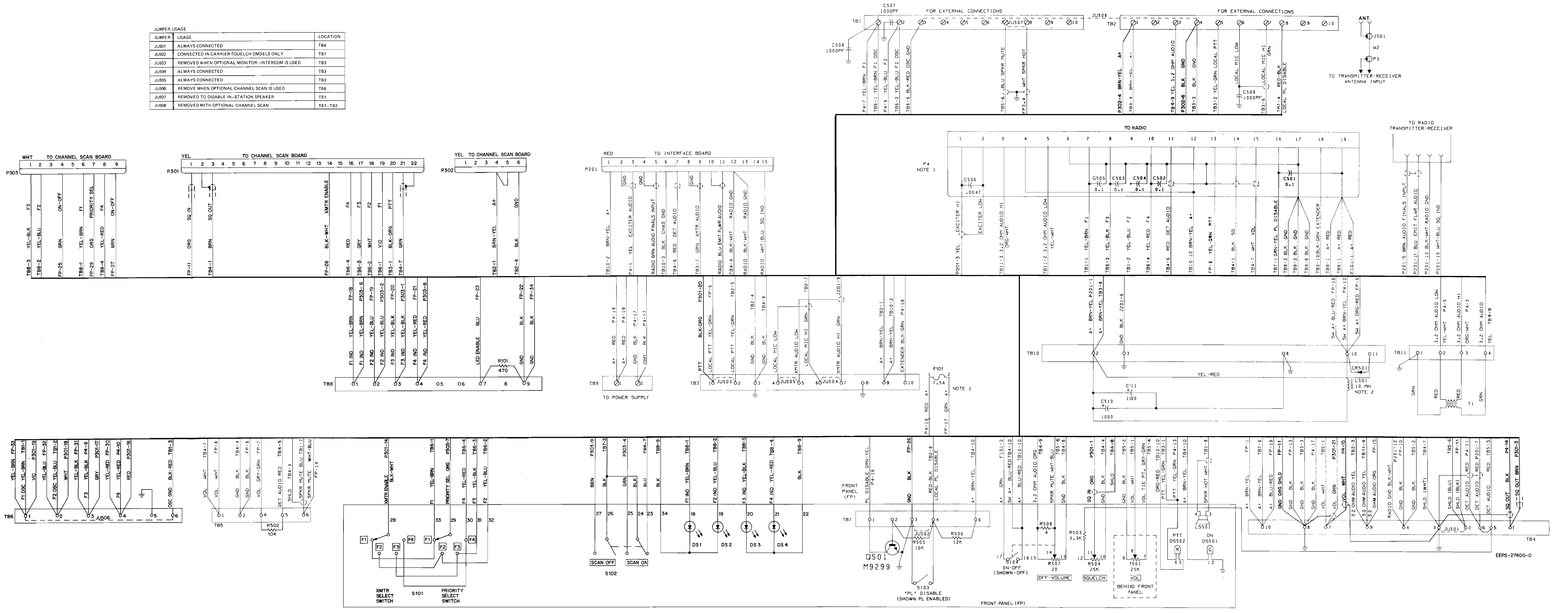
NOTES

1. C501 AND C504 THROUGH C506 ARE LOCATED WITHIN P4
2. MOUNTED ON CHASSIS
3. FP INDICATES WIRING TO COMPONENTS LOCATED ON THE FRONT PANEL.
4. A JUMPER IS INSTALLED BETWEEN TB2-4 & TB2-8 ON PL STATIONS.

Figure 7.
Remote Control Chassis
Wiring Diagram
Motorola No. EEPS-28093-A
2-24-84 GGI

JUMPER USAGE

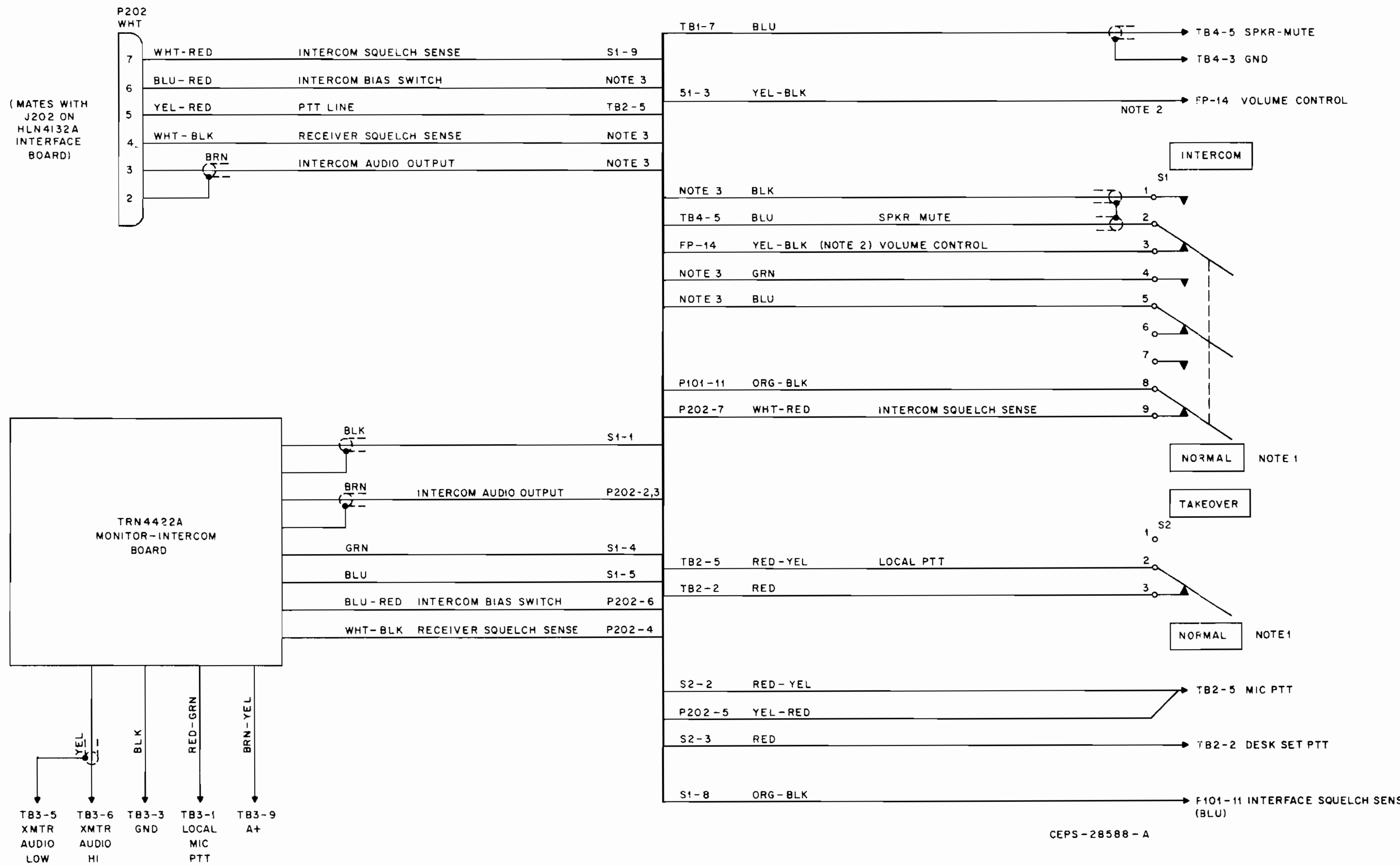
JUMPER	USAGE	LOCATION
JU501	ALWAYS CONNECTED	TB4
JU502	CONNECTED IN CARRIER SQUELCH OMDELS ONLY	TB7
JU503	REMOVED WHEN OPTIONAL MONITOR—INTERCOM IS USED	TB3
JU504	ALWAYS CONNECTED	TB3
JU505	ALWAYS CONNECTED	TB3
JU506	REMOVE WHEN OPTIONAL CHANNEL SCAN IS USED	TB6
JU507	REMOVED TO DISABLE IN—STATION SPEAKER	TB1
JU508	REMOVED WITH OPTIONAL CHANNEL SCAN	TB1—TB2



NOTES
1. C501 THROUGH C506 ARE LOCATED WITHIN P4.
2. MOUNTED ON THE CHASSIS
3. FP INDICATES WIRING TO COMPONENTS LOCATED ON THE FRONT PANEL

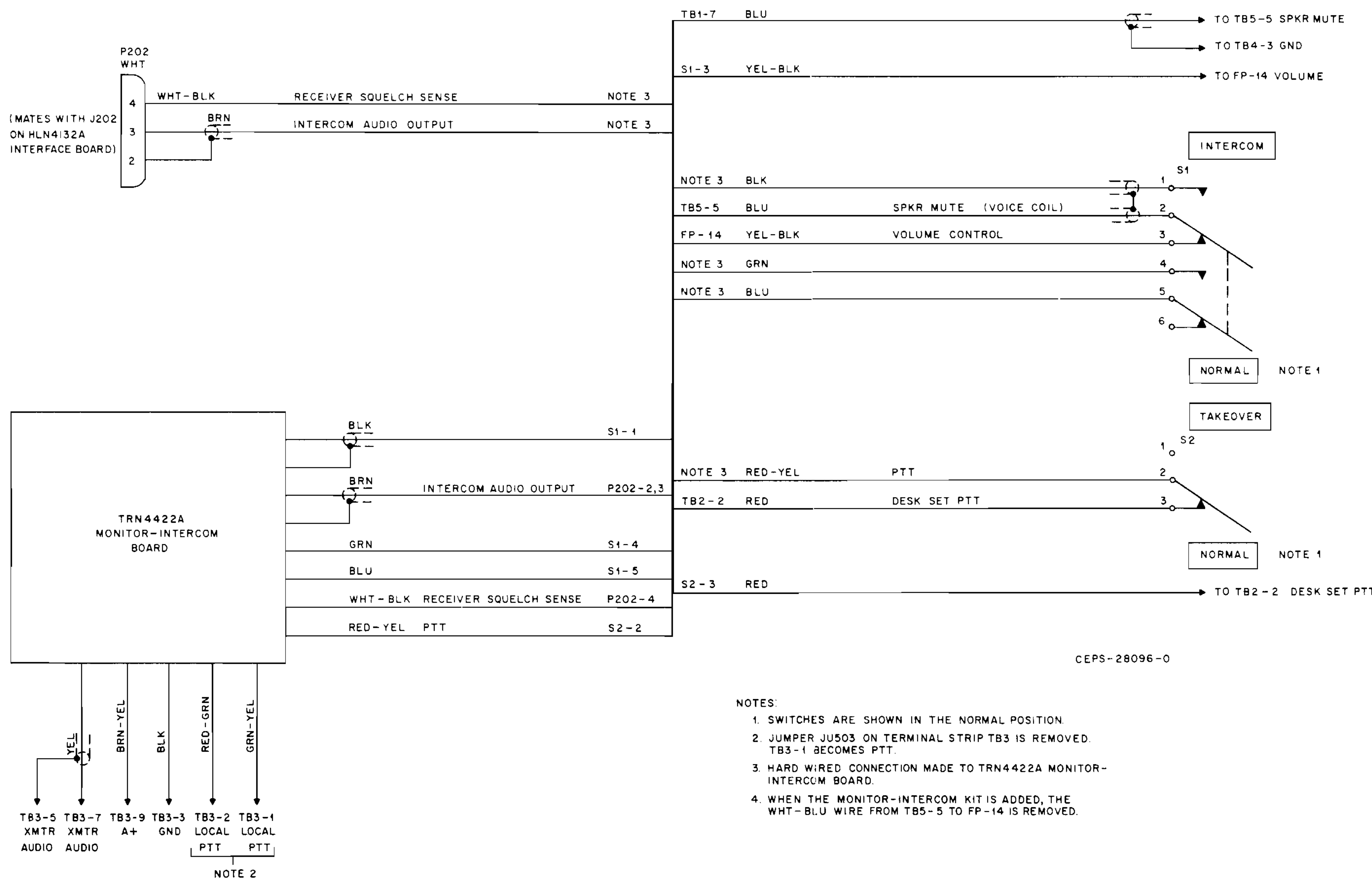
Figure 8.
Local Control Chassis with "Channel-Scan" Monitor Wiring Diagram
Motorola No. EEPS-27400-O

2-24-84 GGI



NOTES:
1. SWITCHES ARE SHOWN IN THE NORMAL POSITION. SWITCHES MOUNTED ON FRONT PANEL (FP).
2. WHEN THE MONITOR INTERCOM KIT IS ADDED, THE WHT-BLU WIRE FROM TB4-5 TO FP-14 IS REMOVED.
3. HARD WIRED CONNECTION MADE TO TRN4422A MONITOR-INTERCOM BOARD.

Monitor-Intercom Wiring Diagram
For Local-Remote Control Stations
Motorola No. CEPS-28588-A
2-24-84 GGI



NOTES:
1. SWITCHES ARE SHOWN IN THE NORMAL POSITION.
2. JUMPER JU503 ON TERMINAL STRIP TB3 IS REMOVED. TB3-1 BECOMES PTT.
3. HARD WIRED CONNECTION MADE TO TRN4422A MONITOR-INTERCOM BOARD.
4. WHEN THE MONITOR-INTERCOM KIT IS ADDED, THE WHT-BLU WIRE FROM TB5-5 TO FP-14 IS REMOVED.

Emergency Power Reverting Kit
Schematic Diagram and Circuit Board Detail
Motorola No. ***63P81011E23-J***
2-24-84 GGI

parts list

HLN4135A Panel & Chassis Kit (LOCAL) — PL-6655-A

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed; uF: unless otherwise stated
C501 thru 505	21-82372C03	0.1, +80-20%; 25 V
C506	21-82428B09	0.0047, ±10%; 100 V
C507 thru 509	21-82187B14	1000 pF ±10%; 100 V
C510, 511	23-83210A24	1000 +150-10%; 20 V
		diode: (see note)
CR501	48-82466H13	silicon
		lamp, incandescent:
DS501, 502	65-82010C03	14 V; 0.08A; type 756
		fuse:
F101	65-86099	7.5A, 32 V
		connector, receptacle:
J501		includes 9-82442E01 female bulkhead, UHF type; and 15-483599 receptacle hood
		coil, audio:
L501	25-82864K01	10 mH filter choke
		loudspeaker, magnetic:
L5501	50-82774C01	oval; 3" x 5"; 3.2 ohms impedance; weatherproof type
		connector, plug:
P3	28-84579F01	male; coaxial; UHF type
	or 2884579F04	male; coaxial; UHF type
P4		includes: 9-801050 connector, female, 19-contact; 15-82075D01 housing, right-hand; 15-82075D03 housing, left-hand; 1-80701T52 assembly, retaining screw & knob; 2-129924 nut, 4-40 x 1/4" x 3/32", BLK; 2 used 3-131758 screw, machine, 4-40 x 1-1/8"; 2 used 3-132127 screw, tapping, 6-20 x 3/4"; 2 used 4-11722 washer, "C" 4-800671 washer, 0.16" thick; 42-80168A01 clip, strain relief
P201		includes: 15-83498F22 housing, female, RED, 15-contact; 29-83499F01 terminal; 13 used
		transistor: (see note)
Q501	48-869299	NPN; type M9299
		resistor, fixed; ohms, ±10%; 1/2 W; unless otherwise stated
R501	18-82515B46	variable, 25k ±30%; 0.16 W
R502	6-125C73	10k
R503	6-125C61	3.3k
R504	18-82700D07	variable, 25k ±30%; 0.16 W
R505	6-125C73	10k
R506	6-124C75	12k; 1/4 W
R507	18-84609E07	variable, 20; 1 W; includes reference part S104
R508	17-82177B03	4; 5 W
		switch:
S104		dpst, part of R507
		transformer, audio:
T1	25-80188B01	3.2 ohms impedance; 1:1 ratio
		terminal board:
TB1, 2	31-848187	10 single screw terminals; coded 1 thru 10
TB3, 4	31-120975	10 soldering lugs
TB5	31-127888	5 soldering lugs
TB6	31-127609	6 soldering lugs
TB7	31-129354	6 soldering lugs
TB8	31-135071	9 soldering lugs
TB9	31-50378	2 double screw terminals
TB10	31-136591	11 soldering lugs
TB11	31-121171	4 soldering lugs
		line, rf transmission:
W2	1-80713B48	includes: referenced parts J501 and P3; and 30-82921H01 coaxial cable, 28" used

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		non-referenced items
	1-80703T19	CABLE & CONNECTOR, local includes:
	29-82010D01	TERMINAL; 2 used
	42-10217A02	STRAP, tie; 24 used
	1-80703T43	CABLE; coaxial, local includes: referenced parts C501 thru C506 and P4
	29-824151	LUG, slotted tongue; 2 used
	1-80703T30	CABLE, audio; local & remote
	1-80703T24	CHASSIS, riveted, local includes: reference parts L501, T1, TB1 thru TB3, TB10 and TB11
	4-7607	WASHER, flat; 7 used
	7-83421K01	STIFFENER, local
	9-83909E01	HOLDER, fuse; panel mounting
	14-83810K01	INSULATOR, fuse
	27-80189B01	BASE, chassis
	29-3014	LUG, solder; 10 used
	55-838718	CATCH; 2 used
	75-864052	BUMPER, recess; 4 used
	1-80703T15	LATCH, riveted; 2 used
	1-80703T31	CABLE & CONNECTOR, interface includes: referenced part P201
	29-84706E02	TERMINAL, crimp socket; 4 used
	42-10217A02	STRAP, tie; 9 used
	1-80703T46	Z BRACKET & SWITCH, local includes: referenced parts R501, R502 and TB5, and
	2-1376	NUT, 3/8"-32 x 1/2" x 3/32"
	4-7698	LOCKWASHER, 3/8", internal
	7-83714G01	BRACKET
	1-80703T49	VOLUME CONTROL & ON/OFF SWITCH includes: referenced parts R507 (w/S104) and R508
	1-80713B44	ASSEMBLY, riveted panel includes: referenced parts TB4, TB7 and TB8
	29-3014	LUG, solder; 6 used
	64-83117G01	PANEL, front
	2-1376	NUT, 3/8"-32 x 1/2" x 3/32"; 2 used
	2-7041	NUT, 2-56 x 3/16" x 1/16"
	2-7048	NUT, 10-32 x 5/16" x 1/8"; 2 used
	2-83599D01	NUT, speed; 10 used
	2-83599D02	NUT, speed; 4 used
	3-1970	SCREW, machine; 2-56 x 1/4"
	3-3398	SCREW, tapping; 6-20 x 3/8"; 4 used
	3-6946	SCREW, machine; 10-32 x 5/8"; 2 used
	3-134186	SCREW, tapping; 6-32 x 5/16"; 5 used
	3-135049	SCREW, tapping; 10-32 x 3/8"; 4 used
	3-135111	SCREW, tapping; 4-40 x 3/8"; 4 used
	3-488098	SCREW, tapping; 8-18 x 3/8"; 4 used
	4-1720	WASHER, flat; 0.156" i.d., 0.375" o.d., 0.03" thick
	4-7652	LOCKWASHER, external, #10; 2 used
	4-7667	LOCKWASHER, external, #4
	4-7691	LOCKWASHER, internal, 3/8"; 2 used
	4-7698	LOCKWASHER, internal, 3/8"
	4-8406	LOCKWASHER, Internal, #2
	4-82414E05	WASHER, spring, 0.77" i.d., 0.915" o.d., 0.02" thick, 0.104" crown
	7-84101D01	FRAME, front
	9-82778C01	SOCKET, pilot light; 2 used
	10-10043A02	STRAP, tie, RED
	14-83126D01	INSULATOR
	14-83553K01	INSULATOR (for TB9)
	15-83154G01	COVER, light; 2 used
	55-83660E03	LOCK
	64-83123G02	PANEL & BEZEL ASSEMBLY
	64-83745G01	PLATE, locating

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

HLN4136A Panel & Chassis Kit (Remote) — PL-6656-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed: uF; unless otherwise stated
C501	21-82372C03	0.1 +80-20%; 25 V
C502, 503		NOT USED
C504, 505	21-82372C03	0.1 +80-20%; 25 V
C506	21-82428B09	0.0047 ±10%; 100 V
C507, 508		NOT USED
C509	21-82187B14	1000 pF ±10%; 100 V
C510, 511	23-83210A24	1000 +150-10%; 20 V
		diode: (see note)
CR501	48-82466H13	silicon
		lamp, incandescent:
DS501, 502	65-82010C03	14 V; 0.08A; type 756
		electrical surge resistor:
E1, 2	80-83029H01	spark gap
		fuse:
F101	65-86099	7.5A, 32 V
		connector, receptacle:
J501		includes 9-82442E01 female bulkhead, UHF type; and 15-483599 receptacle hood
		coil, audio:
L501	25-82864K01	10 mH filter choke
		connector, plug:
P3	28-84579F01	male; coaxial; UHF type
	or 28-84579F04	male; coaxial; UHF type
P4		includes: 9-801050 connector, female, 19-contact; 15-82075D03 housing, right-hand; 15-82075D03 housing, left-hand; 1-80701T52 assembly, retaining screw & knob; 2-129924 nut, 4-40 x 1/4" x 3/32", BLK; 2 used 3-131758 screw, machine, 4-40 x 1-1/8"; 2 used 3-132127 screw, tapping, 6-20 x 3/4"; 2 used 4-11722 washer, "C" 4-800671 washer, 0.16" thick; 42-80168A01 clip, strain relief
P101		includes: 14-84556B02 housing, BLU, 22-contact; 9-84151B03 receptacle, female, 9 used
P102		includes: 14-84556B12 housing, BRN, 22-contact; 9-84151B03 receptacle, female, 9 used
P201		includes: 15-83498F22 housing, female, RED, 15-contact; 29-83499F01 terminal, 15 used
		resistor, fixed: ohms; ±10%; 1/2 W; unless otherwise stated
R501		NOT USED
R502	6-125C73	10k
R503	6-125C61	3.3k
R504	18-82515B46	variable, 25k ±30%; 0.16 W
R505 thru 507		NOT USED
R508	17-82177B19	4 ±5%; 10 W
R509	6-125C57	2.2k
		switch:
S101	40-83204B01	dpdt, slide
		transformer, audio:
T1	25-80188B01	3.2 ohms impedance; 1:1 ratio
		terminal board:
TB1, 2	31-848187	10 single screw terminals; coded 1 thru 10
TB3	31-120975	10 soldering lugs
TB4 thru 8		NOT USED
TB9	31-50378	2 double screw terminals
TB10	31-136591	11 soldering lugs
TB11	31-121171	4 soldering lugs
		line, rf transmission:
W2	1-80713B48	includes: referenced parts J501 and P3; and 30-82921H01 coaxial cable, 28" used
		non-referenced items
	1-80703T20	CABLE & CONNECTOR, remote includes:
	9-84151B03	RECEPTACLE, female contact
	29-82010D01	TERMINAL; 2 used
	42-10217A02	STRAP, tie; 24 used

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
	1-80703T44	CABLE; coaxial; local/remote includes: referenced parts C501, C504 thru C506 and P4
	4-82113D01	WASHER, flat, 0.265" i.d., 0.396" o.d., 0.033" thick
	29-824151	LUG, slotted tongue; 2 used
	1-80703T30	CABLE, audio; local & remote
	1-80703T21	CABLE & CONNECTOR, remote includes: referenced parts P101, P102
	29-83499F01	TERMINAL; 2 used (p/o P201)
	42-10217A02	STRAP, tie; 26 used
	1-80703T25	CHASSIS, riveted, remote includes: referenced parts L501, T1, TB1 thru TB3, TB10 and TB11
	4-7607	WASHER, flat; 6 used
	7-83282K01	STIFFENER, remote
	9-83909E01	HOLDER, fuse; panel mounting
	14-83810K01	INSULATOR, fuse
	27-80189B01	BASE, chassis
	29-3014	LUG, solder; 10 used
	55-838718	CATCH; 2 used
	75-864052	BUMPER, recess; 4 used
	1-80703T15	LATCH, riveted; 2 used
	1-80703T31	CABLE & CONNECTOR, interface includes: referenced part P201
	29-84706E02	TERMINAL, crimp socket; 4 used
	42-10217A02	STRAP, tie; 9 used
	1-80703T47	Z BRACKET & SWITCH, remote includes: referenced parts R504, S101
	2-1376	NUT, 3/8"-32 x 1/2" x 3/32"
	4-7698	LOCKWASHER, 3/8", internal
	7-83281K01	BRACKET
	2-7048	NUT, 10-32 x 5/16" x 1/8"; 2 used
	2-7087	NUT, spacer; 2 used
	2-83599D01	NUT, speed; 10 used
	2-83599D02	NUT, speed; 4 used
	3-6946	SCREW, machine, 10-32 x 5/8"; 2 used
	3-134186	SCREW, tapping; 6-32 x 5/16"
	3-135049	SCREW, tapping; 10-32 x 3/8"; 4 used
	3-135111	SCREW, tapping; 4-40 x 3/8"; 8 used
	3-138810	SCREW, machine, 4-40 x 5/8"; 2 used
	4-1724	WASHER, flat, 0.234" i.d., 0.625" o.d., 0.048" thick
	4-7652	LOCKWASHER, external, #10; 2 used
	4-122238	WASHER, flat, 0.257" i.d., 2.125" o.d., 0.095" thick
	4-82414E05	WASHER, spring, 0.77" i.d., 0.915" o.d., 0.02" thick, 0.104" crown
	7-83278K01	BRACKET, center
	7-83280K01	BRACKET, front
	7-84101D01	FRAME, front
	9-82778C01	SOCKET, pilot light; 2 used
	10-10043A02	STRAP, tie, RED
	14-83126D01	INSULATOR
	14-83553K01	INSULATOR (for TB9)
	15-83154G01	COVER, light; 2 used
	55-83660E03	LOCK
	64-82870K01	PANEL, remote
	64-83123G02	PANEL & BEZEL ASSEMBLY

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

HLN4137A Panel & Chassis Kit (Local/Remote) — PL-6657-A

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed: uF; unless otherwise stated
C501	21-82372C03	0.1 +80-20%; 25 V
C502, 503		NOT USED
C504, 505	21-82372C03	0.1 +80-20%; 25 V
C506	21-82428B09	0.0047 ±10%; 100 V
C507, 508		NOT USED
C509	21-82187B14	1000 pF ±10%; 100 V
C510, 511	23-83210A24	1000 +150-10%; 20 V
		diode: (see note)
CR501	48-82466H13	silicon
		lamp, incandescent:
DS501, 502	65-82010C03	14 V; 0.08A; type 756
		electrical surge resistor:
E1, 2	80-83029H01	spark gap
		fuse:
F101	65-86099	7.5A, 32 V
		connector, receptacle:
J501		includes 9-82442E01 female bulkhead, UHF type; and 15-483599 receptacle hood
		coil, audio:
L501	25-82864K01	10 mH filter choke
		loudspeaker, magnetic:
LS501	50-82774C01	oval; 3" x 5"; 3.2 ohms impedance; weatherproof type
		connector, plug:
P3	28-84579F01	male; coaxial; UHF type
	or 28-84579F04	male; coaxial; UHF type
P4		includes: 9-801050 connector, female, 19-contact; 15-82075D03 housing, right-hand; 15-82075D03 housing, left-hand; 1-80701T52 assembly, retaining screw & knob; 2-129924 nut, 4-40 x 1/4" x 3/32", BLK; 2 used 3-131758 screw, machine, 4-40 x 1-1/8"; 2 used 3-132127 screw, tapping, 6-20 x 3/4"; 2 used 4-11722 washer, "C" 4-800671 washer, 0.16" thick; 42-80168A01 clip, strain relief
P101		includes: 14-84556B02 housing, BLU, 22-contact; 9-84151B03 receptacle, female, 9 used
P102		includes: 14-84556B12 housing, BRN, 22-contact; 9-84151B03 receptacle, female, 11 used
P201		includes: 15-83498F22 housing, female, RED, 15-contact; 29-83499F01 terminal, 15 used
		resistor, fixed: ohms; ±10%; 1/2 W; unless otherwise stated
R501	18-82515B46	variable, 25k ±30%; 0.16 W
R502	6-125C73	10k
R503	6-125C61	3.3k
R504	18-82700D07	variable, 25k ±30%; 0.16 W
R505, 506		NOT USED
R507	18-84609E07	variable, 20; 1 W; includes reference part S104
R508	17-82177B03	4; 5 W
		switch:
S101	40-83303G05	dpdt, lever
S104		dpst, part of R507
		transformer, audio:
T1	25-80188B01	3.2 ohms impedance; 1:1 ratio
		terminal board:
TB1, 2	31-848187	10 single screw terminals; coded 1 thru 10
TB3, 4	31-120975	10 soldering lugs
TB5		NOT USED
TB6	31-127609	6 soldering lugs
TB7	31-129354	6 soldering lugs
TB8	31-135071	9 soldering lugs
TB9	31-50378	2 double screw terminals
TB10	31-136591	11 soldering lugs
TB11	31-121171	4 soldering lugs
		line, rf transmission:
W2	1-80713B48	includes: referenced parts J501 and P3; and 30-82921H01 coaxial cable, 28" used

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		non-referenced items
	1-80703T22	CABLE & CONNECTOR, local/remote includes:
	29-82010D01	TERMINAL; 2 used
	42-10217A02	STRAP, tie; 24 used
	1-80703T44	CABLE; coaxial; local/remote includes: referenced parts C501, C504 thru C506 and P4
	4-82113D01	WASHER, flat, 0.265" i.d., 0.396" o.d., 0.033" thick
	29-824151	LUG, slotted tongue; 2 used
	1-80703T30	CABLE, audio; local & remote
	1-80703T23	CABLE & CONNECTOR, local/remote includes: referenced parts P101, P102
	29-83499F01	TERMINAL; 2 used (p/o P201)
	42-10217A02	STRAP, tie; 26 used
	1-80703T25	CHASSIS, riveted, remote includes: referenced parts L501, T1, TB1 thru TB3, TB10 and TB11
	4-7607	WASHER, flat; 6 used
	7-83282K01	STIFFENER, remote
	9-83909E01	HOLDER, fuse; panel mounting
	14-83810K01	INSULATOR, fuse
	27-80189B01	BASE, chassis
	29-3014	LUG, solder; 10 used
	55-838718	CATCH; 2 used
	75-864052	BUMPER, recess; 4 used
	1-80703T15	LATCH, riveted; 2 used
	1-80703T31	CABLE & CONNECTOR, interface includes: referenced part P201
	29-84706E02	TERMINAL, crimp socket; 4 used
	42-10217A02	STRAP, tie; 9 used
	1-80703T48	Z BRACKET & SWITCH, local/remote includes: referenced part R501
	2-1376	NUT, 3/8"-32 x 1/2" x 3/32"
	4-7698	LOCKWASHER, 3/8", internal
	7-83714G01	BRACKET
	1-80703T49	VOLUME CONTROL & ON/OFF SWITCH includes: referenced parts R507 (w/S104) and R508
	1-80713B44	ASSEMBLY, riveted panel includes: referenced parts TB4, TB7 and TB8
	29-3014	LUG, solder; 6 used
	64-83117G01	PANEL, front
	2-1376	NUT, 3/8"-32 x 1/2" x 3/32"; 2 used
	2-7048	NUT, 10-32 x 5/16" x 1/8"; 2 used
	2-83599D01	NUT, speed; 10 used
	2-83599D02	NUT, speed; 4 used
	3-3398	SCREW, tapping; 6-20 x 3/8"; 4 used
	3-6946	SCREW, machine; 10-32 x 5/8"; 2 used
	3-134186	SCREW, tapping; 6-32 x 5/16"; 5 used
	3-135049	SCREW, tapping; 10-32 x 3/8"; 4 used
	3-135111	SCREW, tapping; 4-40 x 3/8"; 8 used
	3-488098	SCREW, tapping; 8-18 x 3/8"; 4 used
	4-1720	WASHER, flat; 0.156" i.d., 0.375" o.d., 0.03" thick
	4-7652	LOCKWASHER, external, #10; 2 used
	4-7691	LOCKWASHER, internal, 3/8"; 2 used
	4-7698	LOCKWASHER, internal, 3/8"
	4-82414E05	WASHER, spring, 0.77" i.d., 0.915" o.d.,0.02" thick, 0.104" crown
	7-83278K01	BRACKET, center
	7-83280K01	BRACKET, front
	7-84101D01	FRAME, front
	9-82778C01	SOCKET, pilot light; 2 used
	10-10043A02	STRAP, tie, RED; 2 used
	14-83126D01	INSULATOR
	14-83553K01	INSULATOR (for TB9)
	15-83154G01	COVER, light; 2 used
	55-83660E03	LOCK
	64-83123G02	PANEL & BEZEL ASSEMBLY
	64-83745G01	PLATE, locating

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

TRN6154A Panel & Hardware Kit — PL-5262-A

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		switch:
S103	40-83303G01	lever, spst
		non-referenced items
	2-8382	NUT, hex; 15/32"-32 x 9/16"x 3/32"
	4-8424	LOCKWASHER, internal; 15/32"
	64-83071G61	INSERT, panel (toggle switch)

TRN6183A Local/Remote Multi-Frequency Switch Kit (2-Frequency) — PL-6658-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		switch:
S102	40-83304G01	rotary, 2-position
		non-referenced items
	36-82869K01	KNOB
	42-10217A02	STRAP, tie
	64-83071G76	INSERT, panel (F1, F2)

TRN6153A Local Multi-Frequency Switch Kit (4-Frequency) — PL-6659-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		switch:
S102	40-83304G01	rotary, 4-position w/adjustable stop
		non-referenced items
	36-82869K01	KNOB
	64-83071G65	INSERT, panel (F1, F2, F3, F4)

HLN4144A Miscellaneous Hardware Kit (Local) — PL-6660-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
	3-131965	SCREW, tapping; 8-32 x 3/8"; 4 used
	3-134184	SCREW, tapping; 4-40 x 5/16"; 2 used
	15-80187B01	COVER, heatsink
	36-82869K01	KNOB; 2 used
	64-83071G40	INSERT, panel (blank); 4 used
	64-83073G07	INSERT, panel (meter blank)
	64-83074G07	INSERT, panel (clock blank)
	65-83241G01	LENS, red
	65-83241G02	LENS, green

HLN4133A Miscellaneous Hardware Kit (Remote) — PL-6661-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
	3-131965	SCREW, tapping; 8-32 x 3/8"; 4 used
	3-134184	SCREW, tapping; 4-40 x 5/16"; 2 used
	15-80187B01	COVER, heatsink
	65-83241G01	LENS, red
	65-83241G02	LENS, green

HHN4006A Super **Consolette** Cabinet Housing — PL-6662-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
	3-83307G01	SCREW, knurled; 2 used
	13-813618	DECAL, patent number
	15-84922B03	HOUSING
	33-83051K03	NAMEPLATE
	33-84151E02	NAMEPLATE
	42-10128A10	RING, rubber retaining; 2 used
	54-842366	LABEL, replacement parts
	54-850440	LABEL, FCC
	54-83327G02	LABEL

HLN4147A High Power Hardware Kit (Local) — PL-6173-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		mechanical parts
	3-131965	SCREW, tapping: 8-32 x 3/8"; 4 used
	3-134184	SCREW, tapping: 4-40 x 5/16"; 2 used
	15-80194B01	COVER
	36-82869K01	KNOB; 2 used
	64-83071G40	PANEL, switch insert; 4 used
	64-83073G07	PANEL, insert; 2 used
	65-83241G02	JEWEL, lite: grn.
	65-83241G01	JEWEL, lite: red

HLN4148A High Power Hardware Kit (Remote) — PL-6764-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		mechanical parts
	3-131965	SCREW, tapping: 8-32 x 3/8"; 4 used
	3-134184	SCREW, tapping: 4-40 x 5/16"; 2 used
	15-80194B01	COVER
	65-83241G02	JEWEL, lite: grn.
	65-83241G01	JEWEL, lite: red

parts list

HLN4132A Interface Board PL-6480-A

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed: uF ± 5%; 50 V: unless otherwise stated
C1 thru 5	23-84538G4	15 ± 20%; 20 V
C6	8-83293B10	.033
C7	8-82905G42	0.33 ± 10%
C8, 9	8-82905G02	.022 ± 10%
C10	23-84538G04	15 ± 20%; 20 V
C11	21-82133G03	100 pF; 500 V
C12	8-84637L37	0.1; 100 V
C13	23-84665F01	10 + 100-10%; 25 V
C14	8-84637L36	.082; 100 V
C15, 16	23-84538G04	15 ± 20%; 20 V
C17 thru 20	23-84665F03	100 + 100-10%; 25 V
		diode: (see note)
CR1, 2, 3	48-83654H01	silicon
		connector, plug:
J201	28-83441F16	male: 15-contact
J202	28-83441F08	male: 7-contact
		transistor: (see note)
Q1, 2, 3	48-869642	NPN; type M9642
Q4	48-869594	NPN; type M9594
Q5	48-869642	NPN; type M9642
		resistor, fixed: ± 5%; 1/4 W: unless otherwise stated
R1	6-124A97	100k
R2	6-124A74	11k
R3, 4	6-124A73	10k
R5	6-124A83	27k
R6	6-124A61	3.3k
R7	6-124A49	1k
R8	6-124A97	100k
R9	6-124A94	75k
R10	6-124A81	22k
R11	6-124A87	39k
R12	6-124A82	24k
R13	6-124A65	4.7k
R14	6-124B10	330k
R15	6-124A97	100k
R16	6-124A61	3.3k
R17	6-124A91	56k
R18	6-124A81	22k
R19	6-124A91	56k
R20	6-124A82	24k
R21, 22	6-124A79	18k
R23 thru 26	6-124A73	10k
R27	6-124A89	47k
R28	6-124A97	100k
R29	6-124A73	10k
R30	6-124A81	22k
R31	6-124A91	56k
R32	6-124A61	3.3k
R33 thru 36	6-124A73	10k
R37	6-124A61	3.3k
R38	6-124A65	4.7k
R39	6-124A81	22k
R40, 41	6-124A89	47k
R42	6-124B06	220k
R43	6-124A61	3.3k
R44	6-124B06	220k
R45	6-124A99	120k
R46	6-124A97	100k
R47, 48	6-10621C81	7.87k ± 1%; 1/8 W
R49	6-124A61	3.3k
R50, 51	6-10621C91	10k ± 1%; 1/8 W
R52	6-10621D25	22.1k ± 1%; 1/8 W
R53	6-124A61	3.3k
R54, 55	6-10621C99	12.1k ± 1%; 1/8 W
R56, 57	6-124A82	24k
R58	6-125A37	330; 1/2 W
R59	6-124A43	560
R60	6-124A91	56k
R61	6-124A93	68k
R62	6-124A81	22k
R63	6-124A73	10k
R64, 65	6-124A87	39k
R66, 67	6-124A73	10k
R68	6-124A57	2.2k
R69	6-24A01	10
R70, 71	6-124A45	680; 1/2 W
R72	6-124A13	33
		voltage regulator:
VR1	48-82256C38	Zener type: 9.1 V
VR2	48-82256C23	Zener type: 6.8 V
		integrated circuit: (see note)
U1	51-84887K04	type 4016B
U2	51-83629M08	type LM324
U3, 4	51-84621K76	type M2176

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

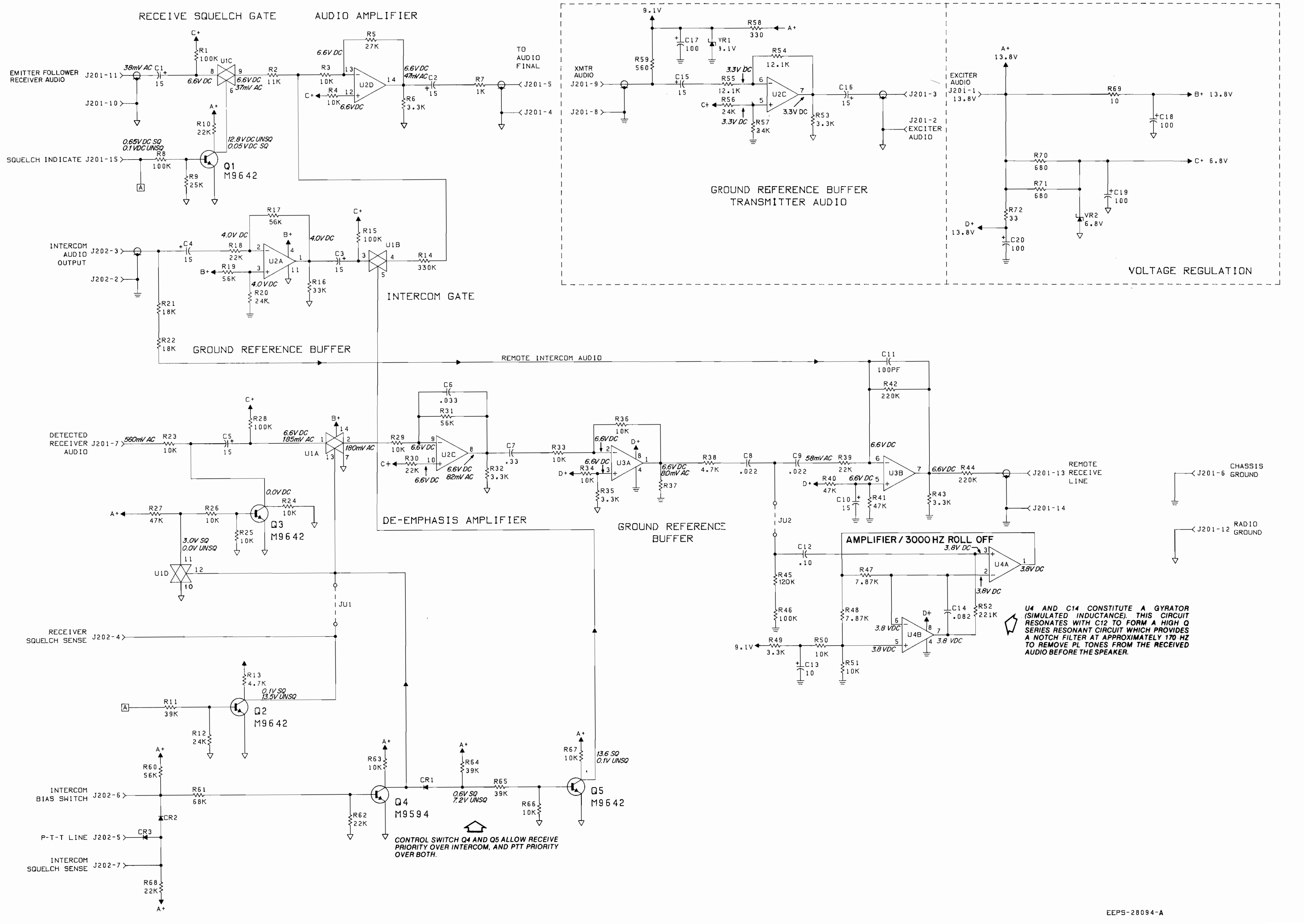
DESCRIPTION

1. GENERAL

The interface board is mounted vertically in the station chassis near the front of the radio set. Connections to the station are made via J201 and J202. Refer to the appropriate functional interconnect diagram in the DESCRIPTION section, under the station data tab of this manual, for interconnection details.

2. SYSTEM CONFIGURATIONS

The operation of thi board varies slightly depending upon the application. Various systems or options are accommodated by jumper and component changes as indicated by the chart on the schematic diagram.



NOTES:

1. GROUND REFERENCE BUFFERS PROVIDE INTERFACE BETWEEN STATION CHASSIS GROUND AND RADIO CHASSIS GROUND
2. VDC = SQUELCHED
VAC = WITH 1 KHZ TONE, 3 KHZ DEV, 1000 MV INPUT
3. GROUND REFERENCE BUFFER U2C PROVIDES APPROXIMATELY 0DB GAIN.
4. GROUND REFERENCE BUFFER U2A PROVIDES APPROXIMATELY 8 DB GAIN.
5. GROUND REFERENCE BUFFER U3A PROVIDES APPROXIMATELY 0 DB GAIN.

COMPONENT	TYPE OF CONTROL: LOCAL WITHOUT INTERCOM	LOCAL WITH INTERCOM	LOC/REM WITHOUT INTERCOM	LOC/REM WITH INTERCOM	REMOTE ONLY
JU1	OUT	OUT	IN	OUT	IN
JU2	IN	IN	IN	IN	IN
CR1	OUT	IN	OUT	IN	OUT
R59	IN	IN	OUT	OUT	OUT
R60	IN	IN	OUT	OUT	OUT
R68	OUT	OUT	OUT	IN	OUT

INTERFACE BOARD

MODEL HLN4132A

FUNCTION

This board interfaces between the base station chassis and the transmitter-receiver unit. It provides the following:

- Intercom capability for local and local-remote models.
- Ground isolation between base station and transmitter-receiver unit chassis.
- Audio interface between the tone or dc remote control board and the transmitter-receiver unit independent of VOLUME and VOLUME LEVEL SET controls.

POWER SUPPLY

MODELS HPN1000A, HPN1003A

FUNCTION

Provides operating voltages for all circuits in the **Mitrek** Super **Consolette** Base Station. Optional HPN1000A Power Supply is used for 120/220/240 V ac, 50 or 60 Hz systems.

parts list

HLN4153A Miscellaenous Hardware Kit (50 Hz)
HLN4154A Miscellaneous Hardware Kit (60 Hz) PL-6650-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
	3-135506	SCREW, tapping: 6-32 x 1/4"; 2 used
	5-10277A09	GROMMET
	14-84340K01	INSULATOR
	29-812979	LUG, solderless; 2 used (HLN4153A)
	29-824151	LUG, slotted tongue; 2 used
	29-847854	LUG, slotted tongue; 2 used (HLN4154A)
	30-858552	CABLE, battery: blk
	30-858553	CABLE, battery: red
	39-10184A01	CONTACT, receptacle
	42-10217A02	STRAP, tie; 3 used

HLN4139A 60 Hz Power Supply Chassis
HLN4140A 50 Hz Power Supply Chassis PL-6649-O

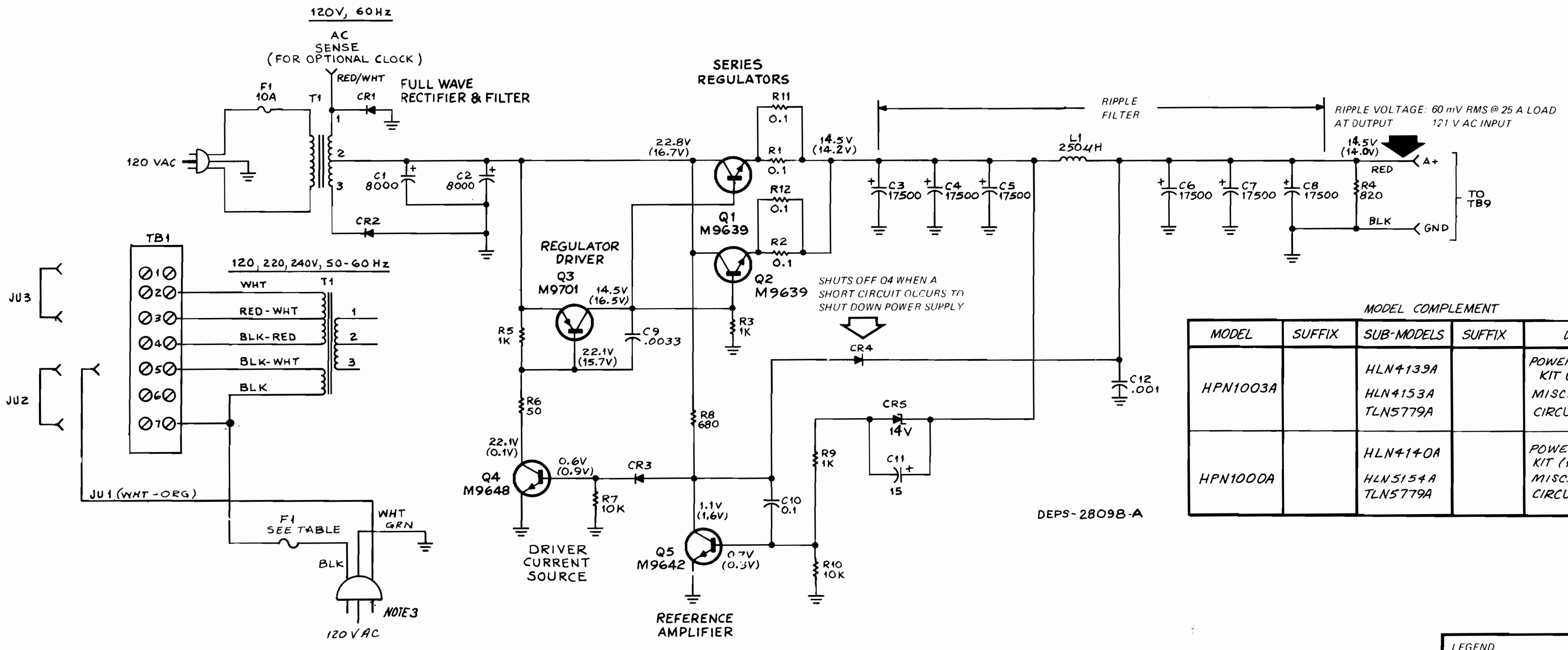
This parts list covers both HLN4139A and HLN4140A models. Where differences exist the model number of the applicable unit is given in the Description column.

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed:
C1, 2	23-83093G13	8000 uF + 150-10%; 35 V
C3 thru 8	23-83093G20	17500 uF + 150-10%; 20 V
C9	21-82428B10	.0033 uF ± 10%; 100 V
		diode assembly: (see note)
CR1, 2	1-80739B59	silicon
		fuse:
F1	65-135105	10A; 125 V
	or 65-52293	5A; 250 V
		coil:
L1	25-84514G01	250 uH
		transistor: (see note)
Q1, 2	48-869639	NPN; type M9639
Q3	48-869701	PNP; type M9701
		resistor, fixed: ± 10%; 7 W:
R1, 2, 11, 12	17-82177B50	0.1
R3	6-125C49	1k; 1/2 W
R5	6-125C49	1k; 1/2 W
R6	17-82177B20	50
		transformer, power:
T1	25-82863K01	120 V ac; 60 Hz (HLN4139A)
	or 25-82863K02	120/220/240 V ac; 50/60 Hz (HLN4140A)
		mechanical parts
	1-80703T12	HEATSINK and TRANSISTOR assembly includes: ref. items R1, 2, 3, 11, 12, Q1, 2
	2-7005	NUT, hex: 6-32 x 1/4 x 3/32"; 4 used
	3-2977	SCREW, machine: 6-32 x 1-1/8"; 4 used
	3-3398	SCREW, tapping: 6-20 x 3/8"
	4-7569	WASHER, flat; 2 used
	4-7650	WASHER, lock: #6 int.; 2 used
	6-7666	WASHER, lock: #6 ext.
	4-474216	WASHER, insulator; 4 used
	4-84496C01	WASHER, shoulder; 4 used
	14-865854	INSULATOR, transistor; 2 used
	26-84923B04	HEATSINK
	29-5207	LUG, solder; 2 used
	29-84489B01	LUG, transistor; 4 used
	30-858553	CABLE, battery: red
	31-118964	TERMINAL STRIP
	42-10217A02	STRAP, tie
	1-80772B91	BRACKET, mounting includes: ref. item R5, 6, C9, Q3
	1-80772B86	BRACKET, riveted
	3-131256	SCREW, tapping: 6-20 x 3/8"; 2 used
	14-83575A01	INSULATOR, transistor
	2-7003	NUT, hex: 8-32 x 5/16 x 1/8"; 4 used
	2-121841	NUT, hex: 6-32 x 5/16 x 7/64"; 6 used
	2-131435	NUT, hex: 4-40 x 1/4 x 3/32"; 2 used (HLN4140A)
	3-1437	SCREW, machine: 4-40 x 5/8"; 2 used (HLN4140A)
	3-7229	SCREW, machine: 6-32 x 3/8"; 2 used
	3-7362	SCREW, machine: 6-32 x 1/2"; 4 used
	3-134185	SCREW, tapping: 6-32 x 1/4"
	3-7467	SCREW, tapping: 8-18 x 3/8"; 2 used (HLN4139A)
	3-139138	SCREW, tapping: 10-32 x 3/8"; 3 used (HLN4140A)
	4-7657	WASHER, lock: #8 ext.; 4 used
	5-10277A15	GROMMET
	9-82083C01	RECEPTACLE, fuse holder
	27-82862K01	CHASSIS, power supply
	30-83211C07	AC CORD and PLUG
	31-121171	TERMINAL STRIP
	31-82272B04	TERMINAL BOARD (HLN4140A)
	42-82018H01	RETAINER, cable

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

TLN5779A Power Supply Board PL-3369-A

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed: uF ± 10%; 50 V: unless otherwise stated
C10	8-82905G30	0.1
C11	23-83214C16	15 ± 5%; 20 V
C12	21-82187B14	.001; 100 V
		diode: (see note)
CR3, 4	48-83654H01	silicon
CR5	48-82256C13	Zener; 14 V
		transistor: (see note)
Q4	48-869648	NPN; type M9648
Q5	48-869642	NPN; type M9642
		resistor, fixed: ± 10%; 1/4 W: unless otherwise stated
R4	6-124C47	820; 1/2 W
R7, 10	6-124C73	10k
R8	6-127C45	680; 2 W
R9	6-124C49	1k



MODEL COMPLEMENT

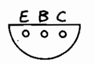
MODEL	SUFFIX	SUB-MODELS	SUFFIX	DESCRIPTION
HPN1003A		HLN4139A		POWER SUPPLY CHASSIS - 60HZ KIT (120 VAC)
		HLN4153A		MISC. HDW. (50HZ)
		TLN5779A		CIRCUIT BOARD
HPN1000A		HLN4140A		POWER SUPPLY CHASSIS - 50HZ KIT (120/220/240 VAC)
		HLN5154A		MISC. HDW. (60HZ)
		TLN5779A		CIRCUIT BOARD

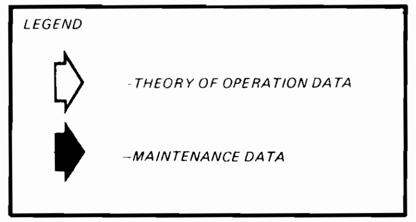
CONNECTION TABLE

POWER SOURCE	CONNECT	FROM	TO	FUSE(F1)
120VAC	JU1	–	TB1-5	10A
	JU2	TB1-4	TB1-7	
	JU3	TB1-2	TB1-5	
220VAC	JU1	–	TB1-3	5A
	JU2	TB1-4	TB1-5	
240VAC	JU1	–	TB1-2	5A
	JU2	TB1-4	TB1-5	

NOTES:

1. RESISTORS ARE IN OHMS, CAPACITORS ARE IN MICROFARADS.
2. VOLTAGES NOT IN PARENTHESES TAKEN WITH NO LOAD. VOLTAGES IN PARENTHESES ( ) TAKEN WITH 25-AMP LOAD.
3. WHEN USING THE HPN1000A POWER SUPPLY IN 220/240 V AC APPLICATIONS, A SECOND FUSE OF THE SAME TYPE AS F1 MUST BE FIELD INSTALLED IN THE WHITE AC POWER LINE LEAD. INSTALL THE FUSE IN ACCORDANCE WITH APPLICABLE LOCAL ELECTRICAL CODES.





68P81043E32-A
2-24-84 GGI

POWER SUPPLY

MODELS HPN1001A, HPN1002A

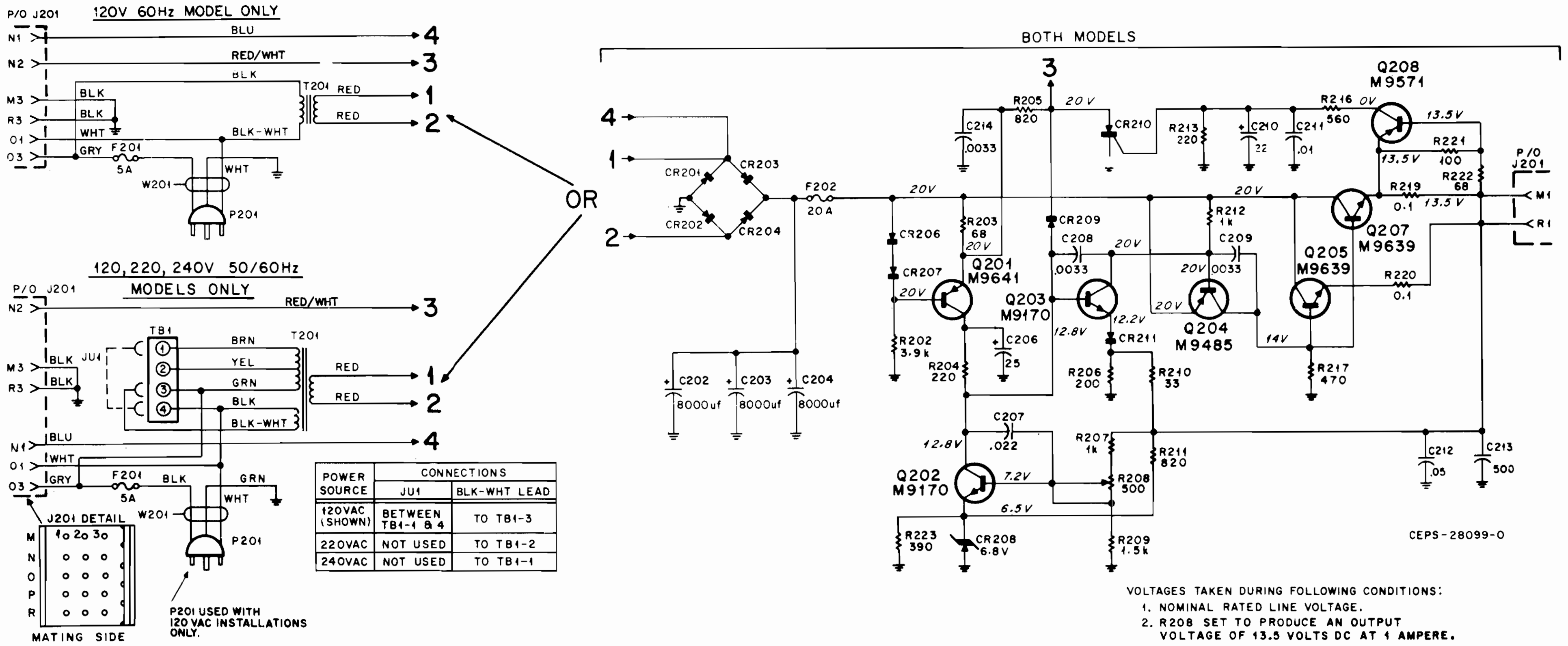
FUNCTION

Provides operating voltages for all circuits in the **Mitrek** Super **Consolette** Base Station. Optional HPN1002A Power Supply is used for 120/220/240 V ac, 50 or 60 Hz systems.

MODEL	SUB–MODELS	DESCRIPTION
HPN1001A 120 VOLT	HLN4151A	MISC. HDW. (60HZ)
	HKN4053A	CABLE KIT
	HLN4130A	CHASSIS KIT
	TLN4405B	CIRCUIT BOARD
HPN1002A 120, 220, 240 VOLT	HLN4152A	MISC. HDW. (50HZ)
	HKN4053A	CABLE KIT
	HLN4134A	CHASSIS KIT
	TLN4405B	CIRCUIT BOARD

NOTES:

1. UNLESS OTHERWISE STATED, CAPACITOR VALUES ARE IN MICROFARADS. RESISTOR VALUES ARE IN OHMS.
2. UNLESS OTHERWISE STATED, VOLTAGE MEASUREMENTS ARE FOR DC VOLTAGES MEASURED WITH A MOTOROLA SOLID–STATE DC MULTIMETER.
3. WHEN USING THE HPN1002A POWER SUPPLY IN 220/240 V AC APPLICATIONS, A SECOND FUSE OF THE SAME TYPE AS F1 MUST BE FIELD INSTALLED IN THE WHITE AC POWER LINE LEAD. INSTALL THE FUSE IN ACCORDANCE WITH APPLICABLE LOCAL ELECTRICAL CODES.



parts list

TLN4405A Circuit Board Kit — PL-6652-A

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed: uF ± 10%; unless otherwise stated
C206	23-82601A08	25 + 150-10%; 500 V
C207	8-82905G02	.022; 50 V
C208, 209	21-82428B10	.0033; 100 V
C210	23-83214C07	22; 15 V
		diode: (see note)
CR206, 207, 209	48-83654H01	silicon
CR210	48-84755H01	silicon, controlled type
CR211	48-83654H01	silicon
		transistor: (see note)
Q201	48-869641	PNP; type M9641
Q202, 203	48-869170	NPN; type M9170
Q204	48-869485	PNP; type M9485
		resistor, fixed: ± 10%; 1/4 W; unless otherwise stated
R202	6-124C63	3.9k
R203	6-124C21	68
R204	6-124C33	220
R207	6-124C49	1k
R208	18-82943G02	var. 500 ± 20%; 3 W
R209	6-124C53	1.5k
R210	6-124C13	33
R211	6-124C47	820
R212	6-124C49	1k
R213	6-124C33	220
R216	6-124C43	560
R221	6-124A25	100 ± 5%
R222	6-124A21	68 ± 5%
R223	6-124A39	390 ± 5%
		mechanical part
	42-10217A02	STRAP, tie

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

HLN4151A Miscellaneous Hardware Kit (60 Hz)
HLN4152A Miscellaneous Hardware Kit (50 Hz) — PL-6651-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed: uF
C213	23-83210A19	500 + 100-10%; 20 V
C214	21-82428B10	.0033 ± 10%; 100 V
		resistor, fixed:
R205	6-127C47	820 ± 10%; 2 W
R206	17-82177B08	200 ± 10%; 5 W
R217	6-126C41	470 ± 10%; 1 W
		mechanical parts
	3-134184	SCREW, tapping: 4-40 x 5/16"
	3-139138	SCREW, tapping: 10-32 x 3/8"
	3-82227A03	SCREW, machine: 4-40 x 5/16"
	4-801846	WASHER, insulator; 2 used
	4-82418B90	WASHER, insulator; 4 used
	29-82336A01	TERMINAL, female; 6 used
	39-10184A24	CONTACT, receptacle
	42-10217A02	STRAP, tie
	3-134168	SCREW, tapping: 4-40 x 1/4"; 2 used (HLN4152A)
	4-10058B12	WASHER, nylon (HLN4152A)
	43-84379C01	SPACER, threaded (HLN4152A)

HKN4053A Power Supply Cable Kit — PL-6654-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
	29-824151	LUG, slotted tongue; 2 used
	29-84150L01	TERMINAL, wire; 6 used
	14-82337A02	INSULATOR, plug
	14-83799G01	INSULATOR, terminal; 2 used
	15-83934A13	COVER, plug: 15-contact
	37-83159	GROMMET, rubber
	39-83798G01	TERMINAL, female; 2 used
	42-10217A02	STRAP, tie; 3 used

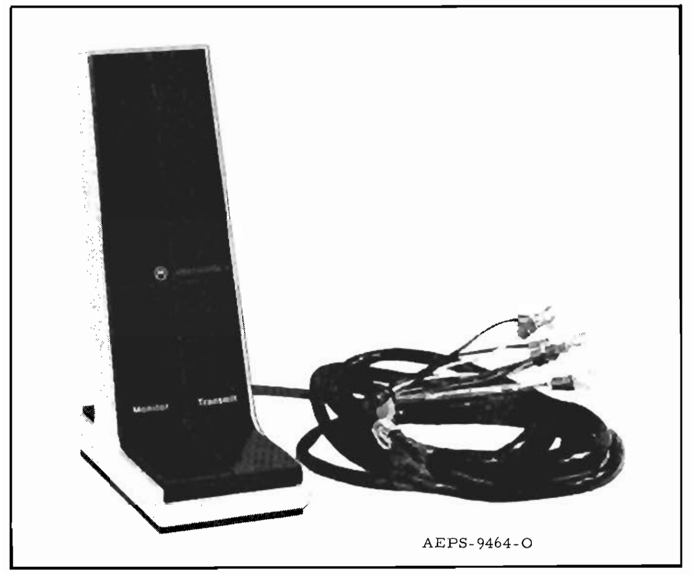
HLN4130A Power Supply Chassis (120 V, 60 Hz)
HLN4134A Power Supply Chassis (120, 220, 240 V, 50/60 Hz) — PL-6653-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed:
C202, 203, 204	23-83093G13	8000 uF + 150-10%; 35 V
		diode: (see note)
CR201, 202	48-82732C07	silicon
CR203, 204	48-82732C10	silicon
		fuse:
F201	65-52293	5 A; 250 V
F202	65-4637	20 A; 32 V
		connector, receptacle:
J201		consists of: 14-83783A04 INSULATOR, receptacle 15-contact 29-82336A01 TERMINAL, contact
		connector, plug:
P201		(part of W201)
		transistor: (see note)
Q205, 207	48-869639	NPN; type M9639
		resistor, fixed:
R219, 220	17-84377B50	0.1 ± 10%; 7 W
		transformer, power:
T201	25-84112C01	pri. BLK-WHT, BLK., resist. 1.3 ohms: sec. RED, RED; resist .033 ohms (HLN4130A)
	or 25-84638C01	pri. No. 1 coded GRN and BRN pri. No. 2 coded BLK/WHT and BLK sec. coded RED and RED pri. total resist. 4.9 ohms sec. resist. 0.035 ohms (HLN4134A)
		terminal board:
TB1	31-135011	4-terminal
		cable assembly, power:
W201	30C83211C05	consists of a 3-conductor cable ("zip cord") and a "molded-on" 3-contact male plug (P201) each conductor No. 18 ga., str., length overall 9 ft.
		mechanical parts
	1-80703T11	HEAT SINK and TRANSISTOR, assembly includes: ref. item R219, 220, Q205, 207
	4-474216	WASHER, insulated; 4 used
	14-865854	INSULATOR, transistor; 4 used
	29-84489B01	LUG, plated; 4 used
	2-7005	NUT, hex: 6-32 x 1/4 x 3/32"; 4 used
	3-2977	SCREW, machine: 6-32 x 1-1/8"; 4 used
	4-7569	WASHER, flat; 2 used
	4-7650	WASHER, lock: #6 int.; 2 used
	4-84496C01	WASHER, shoulder; 4 used
	26-84923B04	HEATSINK
	29-5248	LUG, solder; 2 used
	1-80703T42	CHASSIS, rivited
	7-83959A01	HEATSINK, diode: 4 used
	2-7003	NUT, hex: 8-32 x 5/16 x 1/8"; 4 used
	2-7019	NUT, hex: 4 x 40 x 1/4 x 3/32"; 2 used
	3-127608	SCREW, machine: 4-40 x 5/8"; 2 used
	3-131256	SCREW, tapping: 6-20 x 3/8"; 2 used
	3-131965	SCREW, tapping: 8-32 x 3/8"; 4 used
	3-135502	SCREW, tapping: 4-40 x 5/8"; 2 used
	3-135664	SCREW, tapping: 6-32 x 9/16"; 2 used
	3-136890	SCREW, tapping: 4-40 x 9/32"; 2 used
	3-139138	SCREW, tapping: 10-32 x 3/8"; 3 used
	4-7657	WASHER, lock: #8 ext.; 4 used
	4-7683	WASHER, lock: #4 int.; 2 used
	5-10277A15	GROMMET, plastic
	7-82075H01	BRACKET, receptacle
	14-83168H01	INSULATOR
	14-83967A03	WASHER, shoulder; 2 used
	14-84694C01	INSULATOR
	9-82083C03	RECEPTACLE, fuse
	42-82018H01	RETAINER, cable
	43-84115C01	SPACER, threaded; 2 used

68P81043E33-A
2-24-84 GGI

DESK MICROPHONE

MODELS TMN1004B AND TMN1005B



1. DESCRIPTION

1.1 The TMN1004B 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 TMN1005B Desk Microphone is the same as the TMN1004B 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 7-foot stranded cord with spade-lug termination is routed out through the back at the base of the housing.

2. INSTALLATION

2.1 JUMPER CONFIGURATION

Before connecting the desk microphone to external equipment, 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. The jumpers are removed to obtain the following conditions:

- Jumper JU1 is removed when parallel microphones or other local equipment are connected at the same microphone input.
- Jumper JU2 (Model TMN1005B 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.

2.2 MICROPHONE CONNECTIONS

The desk microphone is connected to external equipment through a 7-foot stranded cord with spade lug terminations. Refer to the applicable equipment manuals to determine the correct microphone connections. Table 1 shows the microphone lead functions.

Table 1. Microphone Leads And Functions

Lead Color	Function
Brown	Microphone High
Shield	Microphone Low
Green	PTT
White	Monitor
Black	Ground
Yellow*	Speaker Audio Hot
Red*	Speaker Audio Mute

* Used only when transmit monitor is desired at parallel-connected dispatch points when microphone is transmitting.

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.

NOTE

If jumper JU1 is cut and intercom operation is required, the operator must press both the intercom button on the associated equipment and the TRANSMIT button on the microphone.

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 TMN1005B 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 1).

Step 4. Remove the cord strain relief from the U-shaped slot.

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 2. 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 per stage functioning. For that reason, no ac voltages are provided on the schematic.

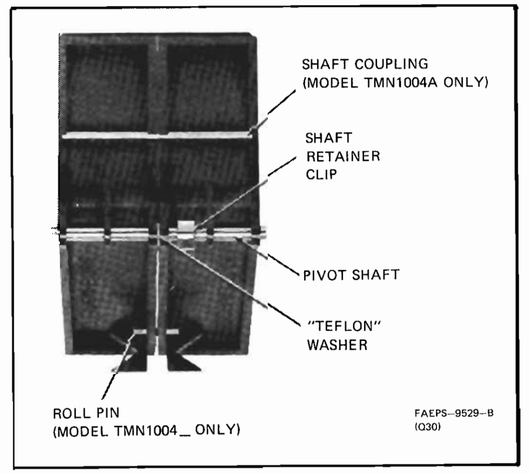


Figure 1. Pivot Shaft Detail

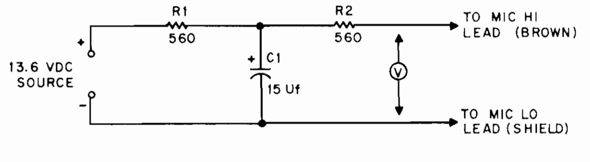


Figure 2. Test Setup

TMN1004B Model Complement

ITEM	DESCRIPTION	VER
TRN8986A	Mic Circuit Board	0
THN6388A	Mic Housing and Hardware	0
TKN8063A	Mic Cable Kit	0

TMN1005B Model Complement

ITEM	DESCRIPTION	VER
TRN8986A	Mic Circuit Board	0
THN6389A	Mic Housing and Hardware	0
TKN8063A	Mic Cable Kit	0

parts list

TRN8986A Microphone Circuit Board — PL-6470-A

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed: uF ± 10%; unless otherwise stated
C1	21-82187B45	470 pF; 500 V
C2	8-82096J08	.022; 200 V
C3	21-82187B44	.001; 100 V
C4	23-84665F09	15 + 150 -10%; 25 V
C5	21-82187B06	560 pF; 500 V
C6	8-82096J04	.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	6-124C25	100 ± 10%
R3	6-124C77	15k ± 10%
R4	6-124B14	470k
R5	6-124A73	10k
R7	6-124A59	2.7k
R8	6-124B08	270k
R9	6-124C55	1.8k
		voltage regulator:
VR1	48-82256C38	Zener; 9.1 V

THN6388A & THN6389A Microphone Housing & Hardware Kit — PL-6471-A

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		switch, leaf:
S1,2	40-84711E02	2 section, multiple nonlocking contacts (THN6388A)
	40-84711E01	2 section multiple nonlocking contacts (THN6389A)
		mechanical parts
	2-10101A69	NUT, spring steel; 2 used
	3-135676	SCREW, tapping:4-40 x 1/4 "; 3 used
	3-138809	SCREW, machine: 4-40 x 5/16"; 4 used
	3-140047	SCREW, machine: 4-40 x 5/8"; 4 used
	4-10058B10	WASHER, ("TEFLON") THN6389A
	15-82976M01	COVER, front
	15-82978M01	COVER, rear
	15-84191E01	HOUSING
	38-84184E01	BUTTON, left hand (THN6389A)
	38-84184E02	BUTTON, left hand (THN6388A)
	38-84192E01	BUTTON, right hand
	22-82591C01	PIN, roll (THN6388A)
	42-84725E01	CLIP,retainer
	47-84193E01	SHAFT
	47-84194E01	SHAFT, extension
	64-82977M01	PLATE, base
	75-84722E01	PAD, base plate
	42-82143C05	CLAMP, cable

TKN8063A Microphone Cable Kit — PL-6672-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
	42-801273	CLAMP
	37-82633B13	GROMMET, rubber
	29-847854	LUG, 7 used

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

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(Sheet 1 of 2)
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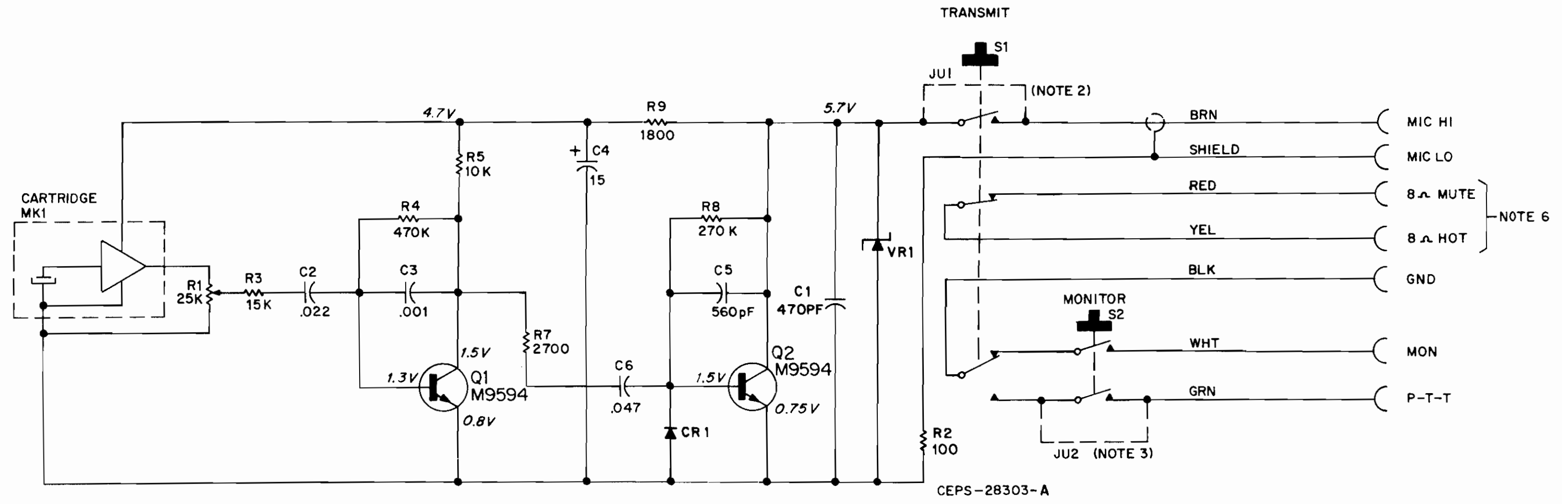
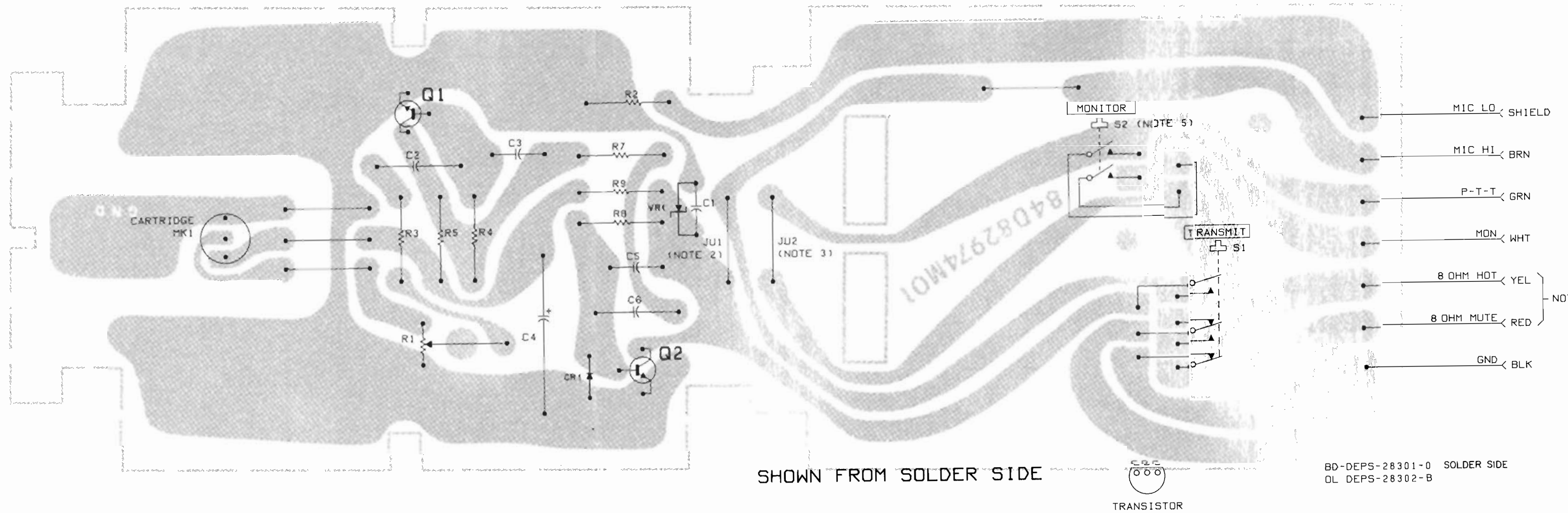


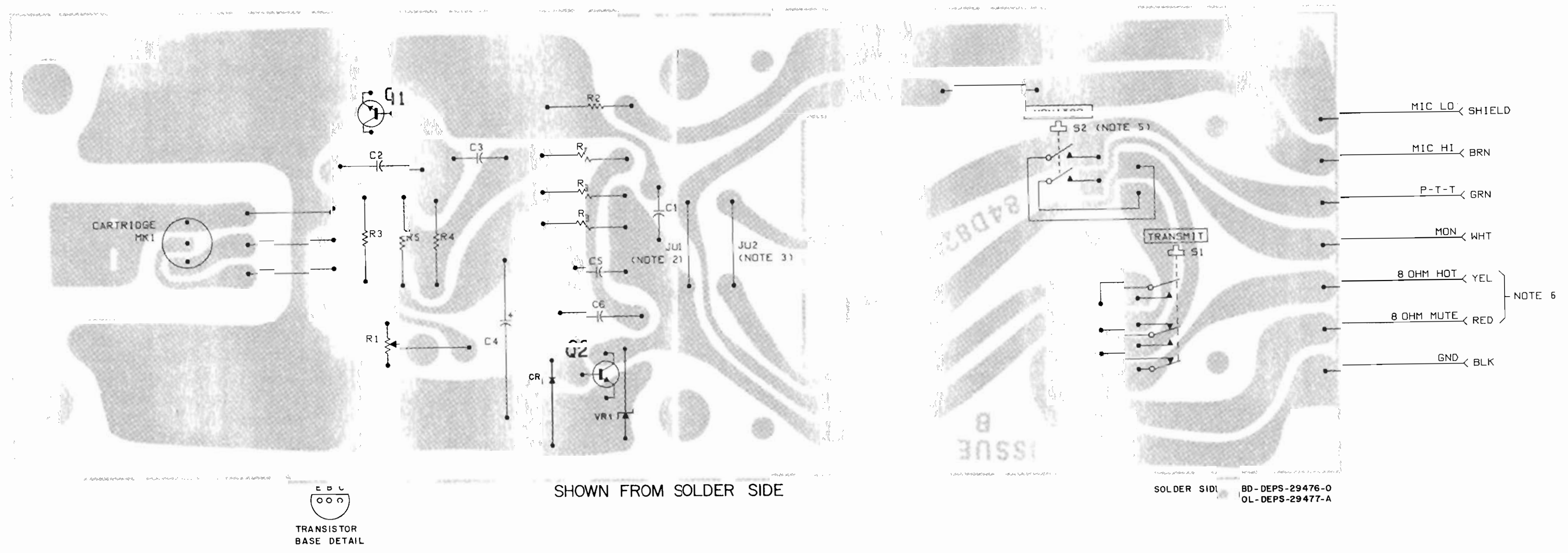
NOTES:

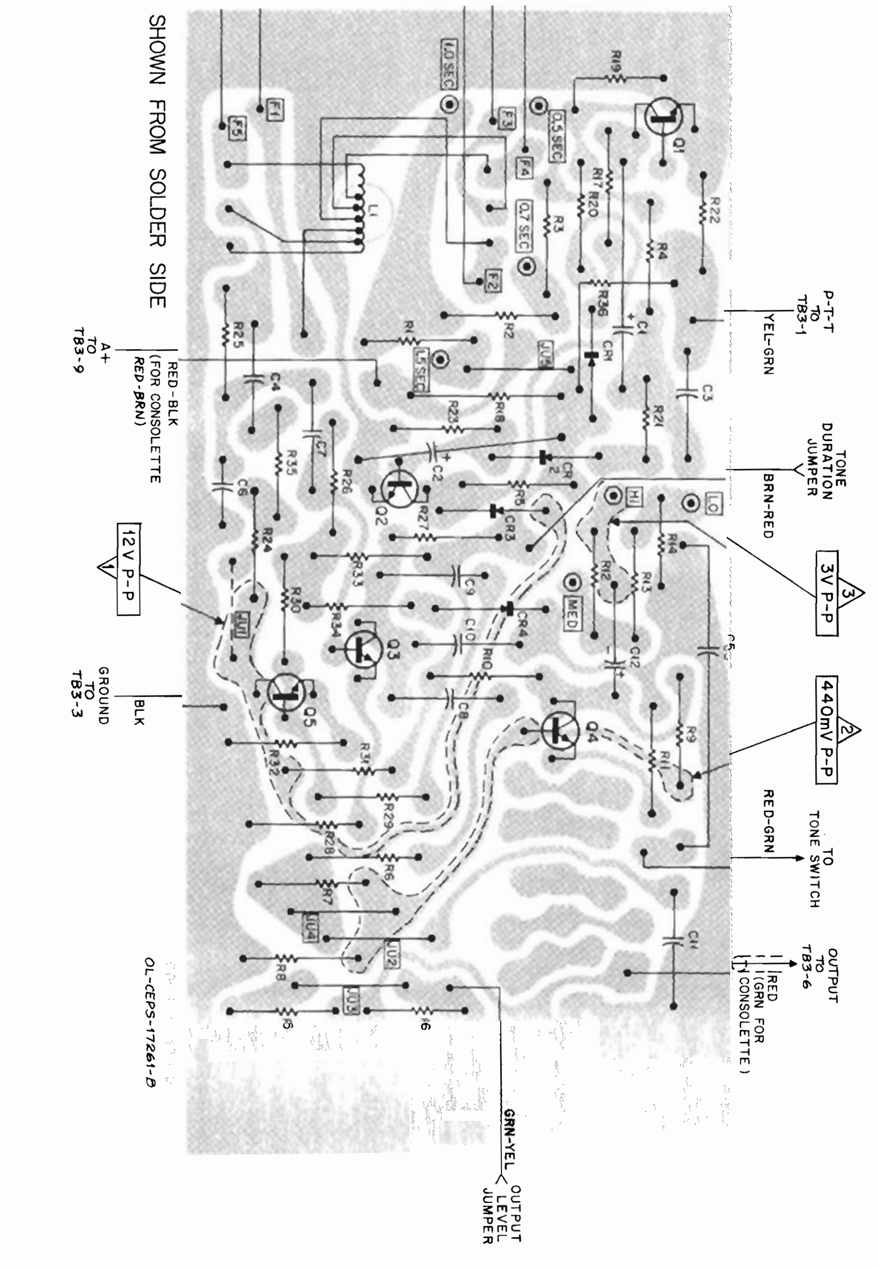
1. UNLESS OTHERWISE STATED:
ALL CAPACITOR VALUES ARE IN MICROFARADS.
2. REMOVE JU1 FOR PARALLEL MIC OPERATION.
3. REMOVE JU2 TO MONITOR BEFORE TRANSMIT.
4. ALL DC VOLTAGE READINGS ARE IN RESPECT TO THE MIC LO LEAD.
5. MONITOR SWITCH S2 IS PRESENT IN MODEL TMN1005B.
6. ON LHB AND MHB SERIES "MOTRAC" LOCAL CONTROL BASE STATIONS WITH TLN1184B MONITOR INTERCOM, 8 OHM MUTE CONNECTS TO TB1–3 (3 OHM MUTE), 8 OHM HOT CONNECTS TO TB1–6 (3 OHM AUDIO LO), AND TB1–6 IS JUMPERED TO GROUND.

EARLY VERSION



LATER VERSION





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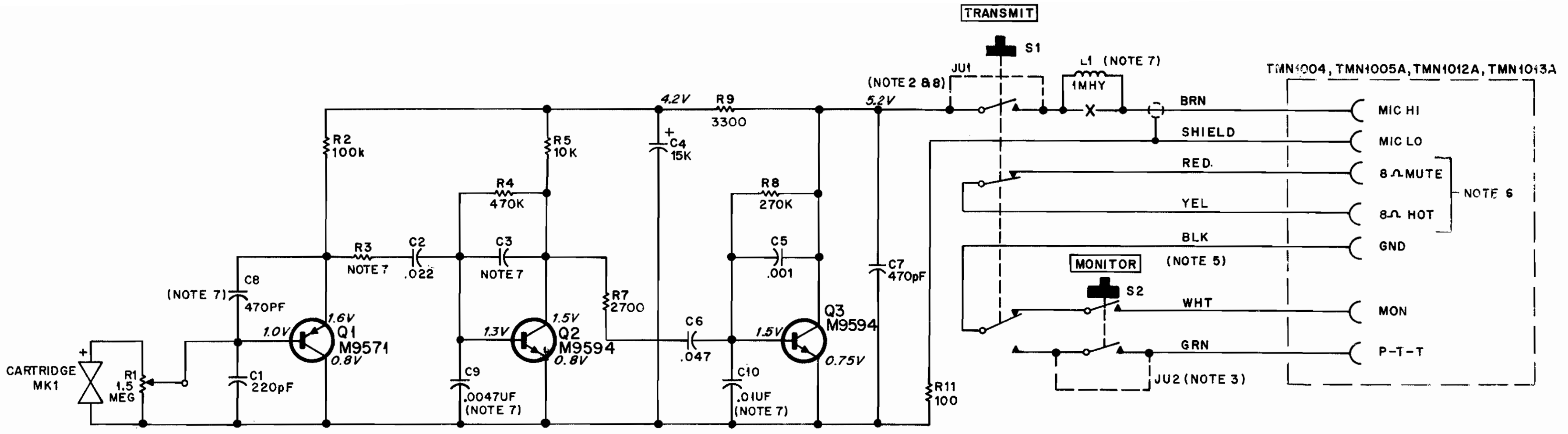
DESK MICROPHONES

MODELS TMN1004A, TMN1005A, TMN1012A, TMN1013A, TMN1014A, TMN1015A, AND TMN1023A



NOTES:

1. UNLESS OTHERWISE STATED: ALL CAPACITOR VALUES ARE IN MICROFARADS.
2. REMOVE JU1 FOR PARALLEL MIC OPERATION. FOR TMN1012A & TMN1013A, CUT JU1 IF INTERCOM KIT IS USED.
3. REMOVE JU2 TO MONITOR BEFORE TRANSMIT.
4. ALL DC VOLTAGE READINGS ARE IN RESPECT TO THE MIC LO LEAD.
5. MONITOR SWITCH S2 IS PRESENT IN MODELS TMN1005A, TMN1013A AND TMN1015A ONLY.
6. ON LHB AND MHB SERIES "MOTRAC" LOCAL CONTROL BASE STATIONS WITH TLN1184B MONITOR INTERCOM, 8 OHM MUTE CONNECTS TO TB1–3 (3 OHM MUTE) AND 8 OHM HOT CONNECTS TO TB1-6(3 OHM AUDIO LO) AND JUMPER TB1–6 TO GROUND.
7. THE FOLLOWING COMPONENT VALUES ARE MODEL–SENSITIVE:

REF. SYM.	TMN1004A AND TMN1005A	TMN1012A, TMN1013A, TMN1014A, TMN1015A, TMN1023A
R3	15k–1/4–10%	22k–1/4–5%
C3	.001	560 pF +10%
C8	NOT USED	470 pF +10%
C9	NOT USED	.0047 +10%
C10	NOT USED	.01 ± 20%
L1	NOT USED	1 mHy

8. REMOVE JU1 FOR ANY CONSOLE WITH INTERCOM SINGLE–TONE OR ALERT–TONE APPLICATIONS.

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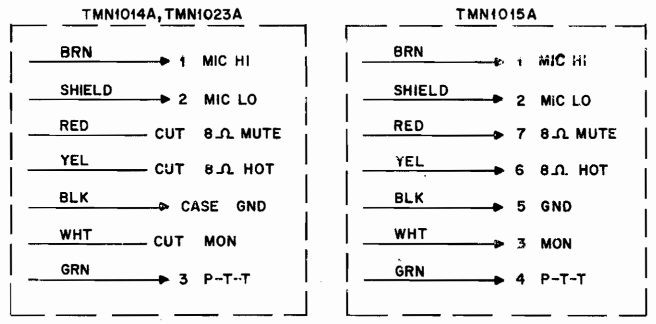


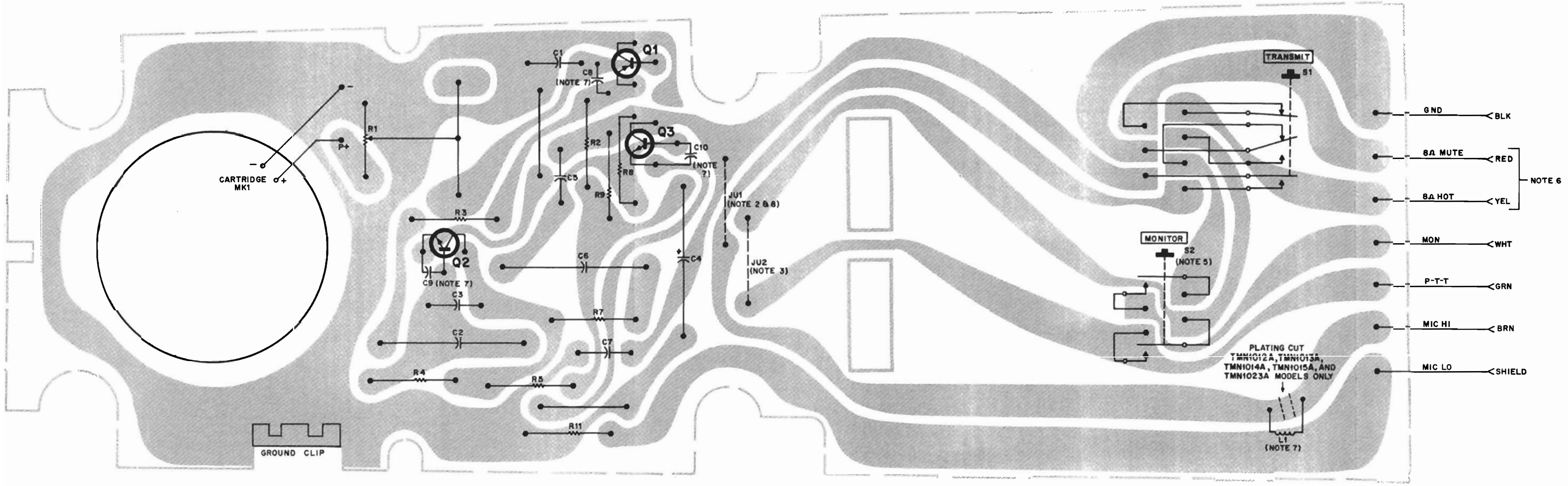
MODEL TABLE

MODEL	SUFFIX	SUB-MODEL	SUFFIX	DESCRIPTION
TMN1004A	2	TLN4925A	2	CIRCUIT BOARD
		THN6154A		HOUSING AND HARDWARE KIT
TMN1005A	2	TLN4925A	2	CIRCUIT BOARD
		THN6155A		HOUSING AND HARDWARE KIT
TMN1012A		TRN6396A		CIRCUIT BOARD
		THN6154A		HOUSING AND HARDWARE KIT
TMN1013A		TRN6396A		CIRCUIT BOARD
		THN6155A		HOUSING AND HARDWARE KIT
TMN1014A		TRN6396A		CIRCUIT BOARD
		THN6279A		HOUSING AND HARDWARE KIT
TMN1015A		TRN6396A		CIRCUIT BOARD
		THN6280A		HOUSING AND HARDWARE KIT
TMN1023A		TRN6396A		CIRCUIT BOARD
		THN6397A		HOUSING AND HARDWARE KIT

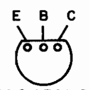
EPS-20626-A

APPLICATIONS

The desk microphones provide a desk surface self-supporting stand to mount the PTT and PL monitor switches and to support the dynamic cartioid microphone element at mouth level. The TMN1005A, TMN1013A and TMN1015A are used in "Private-Line" squelch systems and provides both PTT and monitor switches; the TMN1004A, TMN1012A, TMN1014A and TMN1023A are used carrier squelch systems and uses only the PTT switch.



SHOWN FROM COMPONENT SIDE



TRANSISTOR DETAIL

OL-DEPS-9462-F

DESK MICROPHONE

CONNECTIONS

Lead Color	Function
Brown	Microphone High
Shield	Microphone Low
Green	PTT
White	Monitor
Black	Ground
Yellow*	Speaker Audio Hot
Red*	Speaker Audio Mute

*Use only when transmit monitor is desired at parallel-connected dispatch points when microphone is transmitting.

JUMPERS

Jumper JU1 is removed when parallel microphones or other local equipment are connected at the same microphone input. (For TMN1012A and TMN1013A, cut JU1 to systems without intercom.)

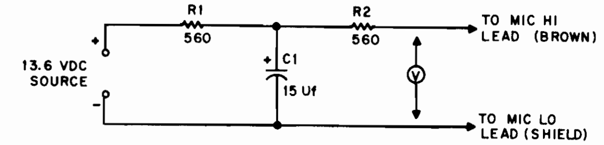
Jumper JU2 (Models TMN1005A and TMN1013A only) is removed when it is necessary to prevent an operator from transmitting without first monitoring a channel to verify it is clear. With JU2 removed, both the MONITOR and TRANSMIT switches must be activated before transmitting.

MAINTENANCE

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 below. 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.



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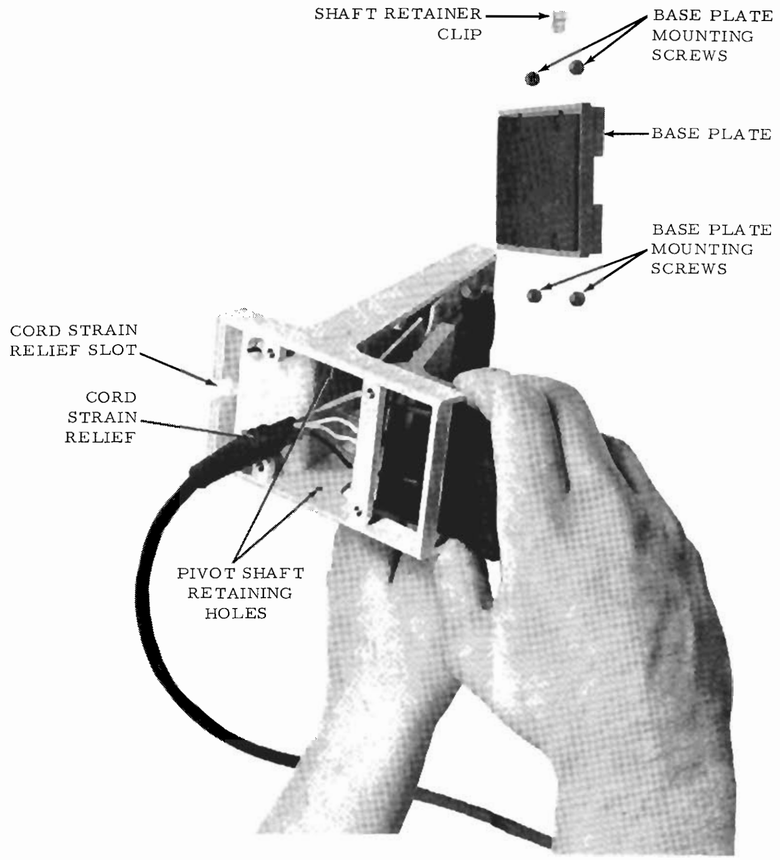


AEPS-9528-O

PARTS LIST

TRN6396A Mic Circuit Board PL-3933-B

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		CAPACITOR, fixed: uf ±10%;
C1	21-82187B08	220 pF; 500 V
C2	8-82987E11	.022; 80 V
C3	21D82187B06	560 pF ±10%; 500 V
C4	23-84762H09	15; ±20%; 20 V
C5	21-82187B44	.001; 100 V
C6	8-82987E02	.047; 200 V
C7	21-82187B45	470 pF; 500 V
C8	21-82213E17	470 pF; 100 V
C9	21-82213E07	.0047 ; 100 V
C10	21-82213E12	.01 ±20%; 100 V
		COIL:
L1	24-82549D03	choke; 1 mHy
		CARTRIDGE, microphone:
MK1	59-84640E01	miniature
		TRANSISTOR: (SEE NOTE)
Q1	48-869571	PNP; type M9571
Q2, 3	48-869594	NPN; type M9594
		RESISTOR, fixed: ±10%; 1/4 W; unless stated
R1	18-83083G34	variable; 1.5 meg; 30%
R2	6-129226	100k
R3	6S124A81	22k ±5%
R4	6-124B14	470k ±5%
R5	6-129668	10k ±5%
R7	6-129707	2.7k ±5%
R8	6-131858	270k ±5%
R9	6-129231	3.3k
R11	6-129753	100
		NON-REFERENCED ITEMS
	5-84371E01	GROMMET, cartridge
	42-84724E01	CLIP, grounding

TLN4925A Mic Circuit Board PL-1884-D

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		CAPACITOR, fixed: uF ±10%
C1	21-82187B08	220 pF; 500 V
C2	8-82987E11	.022; 80 V
C3	21-82187B44	.001; 100 V
C4	23-84762H09	15; ±20%; 20 V
C5	21-82187B44	.001; 100 V
C6	8-82987E02	.047; 200 V
C7	21-82187B45	470 pF; 500 V
		CARTRIDGE, microphone:
MK1	59-84640E01	miniature
		TRANSISTOR: (SEE NOTE)
Q1	48-869571	PNP; type M9571
Q2, 3	48-869594	NPN; type M9594
		RESISTOR, fixed: ±10%; 1/4 W; unl. stated
R1	18-83083G34	variable; 1.5 meg ±30%
R2	6-129226	100k
R3	6-127805	15k
R4	6-124B14	470k ±5%
R5	6-129668	10k ±5%
R7	6-129707	2.7k ±5%
R8	6-131858	270k ±5%
R9	6-129231	3.3k
R11	6-129753	100
		NON-REFERENCED ITEMS
	5-84371E01	GROMMET, cartridge
	42-84724E01	CLIP, grounding

THN6154A, THN6155A, THN6279A, THN6280A & THN6397A Mike Housing & Hardware Kit PL-1885-E

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		SWITCH, leaf:
S1, 2	40-84711E02	2 section, multiple nonlocking contacts (THN6154A, THN6279A & THN6397A)
	40-84711E01	2 section, multiple nonlocking contacts (THN6155A, THN6280A)
		NON-REFEFERENCED ITEMS
	3-136676	SCREW, switch mtg. 4-40 x 1/4 pnl hex
	1-80736B05	CABLE ASSEMBLY includes: 29-847854 LUG, slotted tongue; 7 req'd.
	1-80788B86	CABLE ASSEMBLY for TMN1015A includes: 29-82336A02 connector pins; 7 req'd.
	1-80788B85	CABLE ASSEMBLY for TMN1014A includes: 28-16370 4 plug connector
	1-80717D52	CABLE ASSEMBLY for THN6397A, includes:
	15-82062M01	HOUSING, cord
	28-82005M01	PLUG
	30-83560A02	CABLE, 6-conductor
	41-83576L01	STRAIN RELIEF
	42-10217A02	STRAP, cable
	42-82061M01	CLIP, cable
	43-82063M01	COLLAR
	15-84186E01	COVER, front
	15-84188E01	COVER, rear
	15-84191E01	HOUSING
	26-84720E01	FOIL, grounding, front cover
	26-84721E01	FOIL, grounding, rear cover
	38-84184E02	BUTTON, left hand (THN6154A, THN6279A)
	38-84184E01	BUTTON, left hand (THN6155A, THN6280A)
	38-84192E01	BUTTON, right hand
	42-84725E01	CLIP, retainer
	47-84193E01	SHAFT
	47-84194E01	SHAFT EXTENSION
	47-84723E01	SHAFT COUPLING (THN6154A, THN6279A)
	22-82591C05	PIN, roll (THN6154A THN6279A)
	64-84183E01	PLATE, base
	75-84722E01	PAD, base plate
	3-138809	BASE PLATE SCREW 4-40 x 5/16 phl bn hx bk ox
	3-138810	FRONT COVER SCREW 4-40 x 5/8 phl bn hx bk ox
	4-10058B10	WASHER ("TEFLON")
	4-82418B03	WASHER, insulation

NOTE: Replacement transistors must be ordered by Motorola part number only for optimum performance.

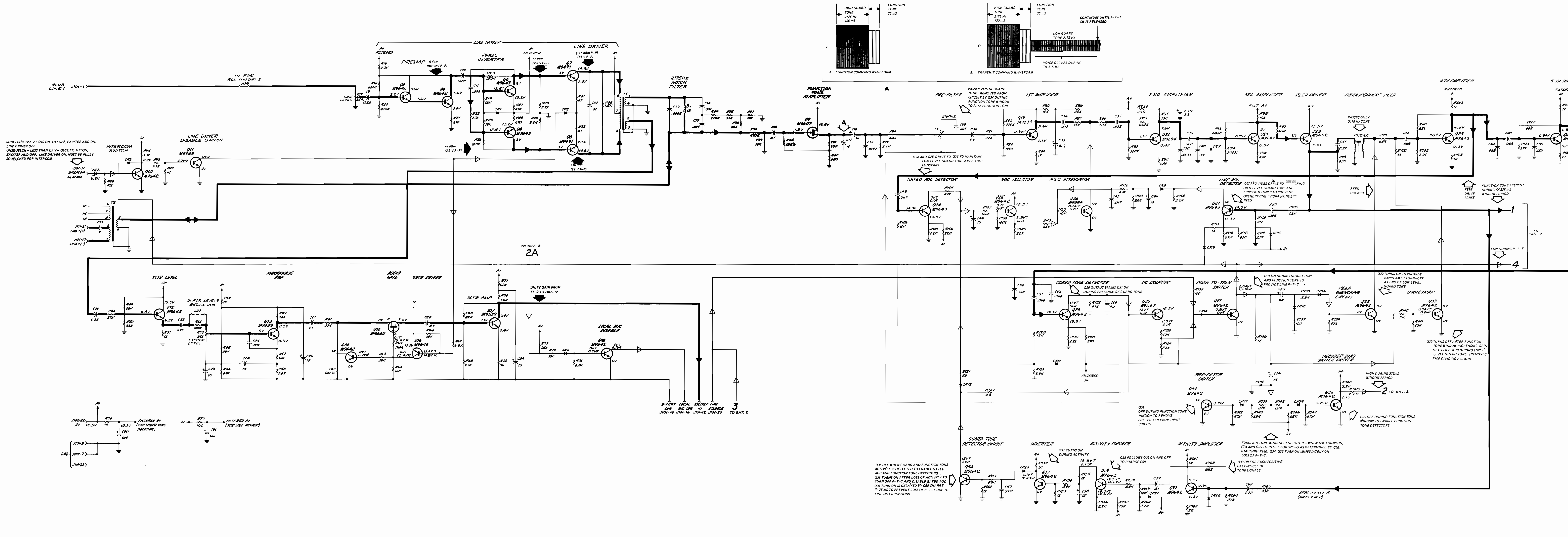
REVISIONS

PEPS-9463-N

BOARD AND SUFFIX NO.	REF. SYMBOL	CHANGE	LOCATION
TLN4924A TLN4925A TMN1004A-1 (TLN4924A-1)	R6	REMOVED (WAS 6-131524, 100 ±5%; 1/4 W) WAS CONNECTED IN SERIES WITH EMITTER OF Q2	Q2 EMITTER
TMN1005A-1 (TLN4925A-1)	R10	REMOV ED (WAS 6-124A01, 10 ±5%; 1/4 W) WAS CONNECTED IN SERIES WITH EMITTER OF Q3.	Q3 EMITTER
TMN1004A-2 (TLN4924A-2) TMN1005A-2 (TLN4925A-2)	R4	FROM 6-124B06, 220k TO 6-124B14, 470k	Q2 COLLECTOR
	R7	FROM 6-127804, 4.7k TO 6-129707, 2.7k	
TLN4924A-2		REPLACED WITH MODEL TLN4925A-2	
TMN1012A TMN1013A TMN1014A TMN1015A		MODELS ADDED	
		NOTES ADDED	
TRN6396A	C8	FROM 21-82187B07 470 pF ±10%; 500 V TO 21-82213E17 470 pF ±10%; 100 V	PARTS LIST
	C9	FROM 21-82428B09 .0047 uF ±10%; 100 V TO 21-82213E07 .0047 uF ±10%; 100 V	
	C10	FROM 21-832501 .01 uF +60-40%; 250 V TO 21-82213E12 .01 uF ±20%; 100 V	
TMN1023A		MODEL ADDED	

TONE REMOTE CONTROL

MODELS TCN1217A, TCN1218A, TCN1219A



MODEL COMPLEMENT

TCN1217A	TCN1218A	TCN1219A	UNIT
1			TRN6742A TONECONTROL BOARD, 1–FREQUENCY CARRIER SQ.
	1		TRN6743A TONECONTROL BOARD, 1–FREQUENCY "PL"
		1	TRN6744A TONECONTROL BOARD, 2–FREQUENCY "PL"
1	1	1	TRN6299A HARDWARE KIT
1	1	1	KLN6902A 2175 Hz "VIBRASPONDER" RESONANT REED

NOTES:

1. UNLESS OTHERWISE INDICATED, CAPACITORS ARE IN MICROFARADS.
2. TRANSISTOR VOLTAGES MEASURED WITH A MOTOROLA DC MULTIMETER (1 MEGOHM INPUT IMPEDANCE) OR EQUIVALENT. ABBREVIATIONS FOR MEASUREMENT CONDITIONS ARE AS FOLLOWS:
   - F = FUNCTION TONE PRESENT
   - F1 = TRANSMITTER KEYED ON F1
   - F2 = TRANSMITTER KEYED ON F2
   - PLD = PL DISABLED
   - PLE = PL ENABLED
   - R = RECEIVE OR STANDBY
3. LINE DRIVER STAGE GAIN MEASUREMENTS MADE WITH –20 dBm ON THE RECEIVER LINE INPUT.

LEGEND

- THEORY OF OPERATION DATA
- MAINTENANCE DATA
- PRIMARY SIGNAL FLOW
- SECONDARY SIGNAL FLOW

FUNCTION

A tone remote control board is in tone controlled remote control stations and local-remote control stations. Permits the station to be remotely controlled via a two-wire telephone type line. Contains tone decoder and switching circuits which converts guard and function tones, from the remote control point, into control signals for the operation of the "Consolette" control station. Also contains all the necessary amplifier and gating circuits for control of transmit and receive audio. Model TCN1217A is used in one-frequency carrier squelch stations, Model TCN1218A is used in one-frequency "Private-Line" squelch stations, and Model TCN1219A is used in two-frequency "Private-Line" squelch stations.

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION

PARTS LIST

"Vibrasponder" Resonant Reed PL-5259-O

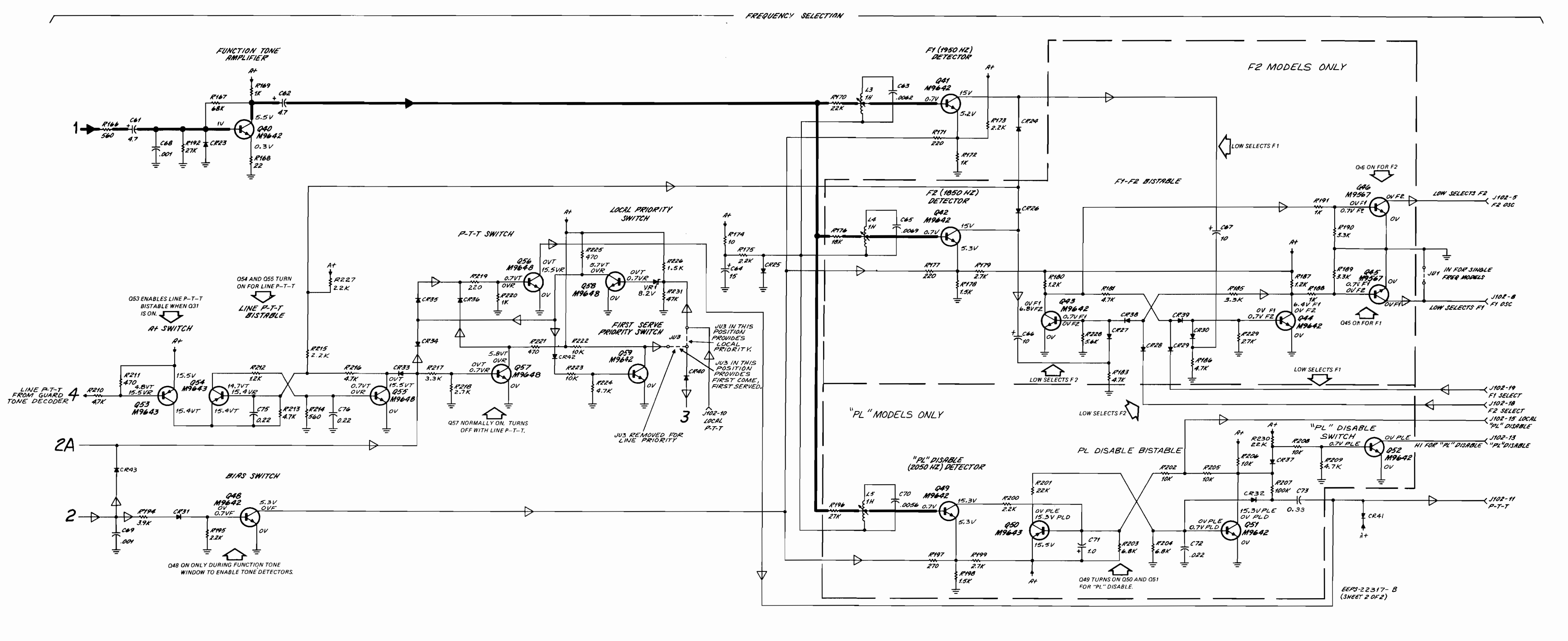
	KLN6209A	See FOREWORD section of this manual for ordering information NOTE: When ordering crystal units, specify carrier frequency and crystal type number.

TRN6183A Remote Multi-frequency Switch Kit
TRN6745A Multi-frequency Switch Kit PL-5241-O

S102	40-82969K01 40-83304G01	SWITCH: rotary; 5 contact (TRN6745A) rotary; 12 contact (TRN6183A)
	MECHANICAL PARTS	
	36-82869K01 42-10217A01 64-83071G77 39-10184A24 64-83071G76	KNOB STRAP, cable harness; 4 used PANEL INSERT (TRN6745A) CONTACT, chain-form; 2 used PANEL INSERT (TRN6183A)

TONE REMOTE CONTROL

68P81034E21-E
(Sheet 1 of 3)
2-24-84 GGI



68P81034E21-E
(Sheet 2 of 3)
2-24-84 GGI

PARTS LIST

TRN6299A Tone Remote Hardware Kit PL-5258-A

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
	2-7005	NUT, hex: 6-32 x 1/4 x 3/32; 2 used
	3-134186	SCREW, tapping; 6-32 x 5/16"; 2 used
	3-134212	SCREW, tapping; 4-40 x 5/16"; 2 used
	4-7569	FLATWASHER; .145-.312 x .027; 2 used
	7-83279K01	BRACKET, rear
	14-84023K01	INSULATOR
	43-84028C05	SPACER

TRN6742A Tone Remote Control Board (1 freq. carrier squelch)
TRN6743A Tone Remote Control Board (1 freq. "PL" squelch)
TRN6744A Tone Remote Control Board (2 freq. "PL" squelch)
PL-5240-C

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		CAPACITOR, fixed: uF ±10%; 50 V; unless otherwise stated
C9, 10	8-82905G11	0.22
C11	8-82905G08	.033
C12	8-82905G01	.01
C13	21-82187B29	.001; 100 V
C14, 15	8-82284C01	.001
C16	8-82905G01	.01
C17, 18	23-82783B27	10; 25 V
C19	8-82045F05	2; 350 V
C21	8-82905G11	0.22
C22	8-82905G05	0.15
C23, 24	23-865136	15 ±20%; 25 V
C25	21-82187B29	.001; 100 V
C26	23-865136	15 ±20%; 25 V
C27, 28	8-82905G07	0.1
C29	23-865136	15 ±20%; 25 V
C30, 31	23-82601A25	100; 20 V
C32	8-82905G26	.0047; 100 V
C33	8-84326A29	.005 ±2%
C34	8-82905G07	0.1
C35	23-865137	4.7 ±20%; 25 V
C36, 37	8-82905G02	.022
C38	8-82905G25	.0033; 100 V
C39	8-82905G02	.022
C40	8-82905G01	.01
C41	8-82905G11	0.22
C42, 43	8-82905G04	.068
C44	23-865136	15 ±20%; 25 V
C45	8-82905G03	.047
C46	23-865136	15 ±20%; 25 V
C47, 48, 49	8-82905G04	.068
C50	21-82187B29	.001; 100 V
C51, 52	8-82905G04	.068
C53	23-865137	4.7 ±20%; 25 V
C54	21-82187B29	.001; 100 V
C55	23-82783B08	1.0 ±20%; 35 V
C56	23-865136	15 ±20%; 25 V
C57	8-82905G11	0.22
C58	23-865136	15 ±20%; 25 V
C59	8-82905G07	0.1
C60	8-82905G11	0.22
C61, 62	23-865137	4.7 ±20%; 25 V
C63	8-84526A14	.0062 ±2%
C64	23-865136	15 ±20%; 25 V
C65	8-84326A15	.0069 (2-freq. models only)
C66, 67	23-82783B27	10 (2-freq. models only)
C68, 69	21-82187B29	.001; 100 V
C70	8-84326A13	.0056 ("PL" models only)
C71	23-82783B08	1.0 ±20%; 35 V ("PL" models only)
C72	8-82905G02	.022 ±20%; 35 V
C73	8-82905G42	0.33
C74, 75, 76	8-82905G11	0.22
C77	8-84326A30	.0045 ±1%
C79	23-82783B07	33 ±20%; 25 V
		DIODE: (SEE NOTE)
CR1, 2, 3, 6 thru 10, 12 thru 23	48-83654H01	silicon
CR24	48-83654H01	silicon (2-freq. models only)
CR25	48-83654H01	silicon
CR26 thru 30	48-83654H01	silicon (2-freq. models only)
CR31	48-83654H01	silicon
CR32	48-83654H01	silicon ("PL" models only)
CR33 thru 36	48-83654H01	silicon
CR37, 38, 39	48-83654H01	silicon (2-freq. models only)
CR40, 42, 43	48-83654H01	silicon
		COIL, assembly, inductor:
L1, 2, 3	1-80702B11	1H; includes ground clip
L4	1-80702B11	1H; includes ground clip (2-freq. models only)
L5	1-80702B11	1H; includes ground clip ("PL" models only)
		TRANSISTOR: (SEE NOTE)
Q3, 4	48-869642	NPN; type M9642
Q5, 6	48-869643	PNP; type M9643
Q7, 8	48-869491	NPN; type M9491
Q9	48-869607	field-effect; M9607
Q10	48-869642	NPN; type M9642
Q11	48-869568	NPN; type M9568
Q12	48-869642	NPN; type M9642
Q13	48-869539	NPN; type M9539
Q14	48-869642	NPN; type M9642
Q15	48-869660	field-effect; M9660
Q16	48-869643	PNP; type M9643
Q17	48-869539	NPN; type M9539
Q18	48-869642	NPN; type M9642
Q19	48-869539	NPN; type M9539
Q20	48-869594	NPN; type M9594
Q21, 22, 23	48-869642	NPN; type M9642
Q24	48-869643	PNP; type M9643
Q25	48-869642	NPN; type M9642
Q26	48-869594	NPN; type M9594
Q27	48-869643	PNP; type M9643
Q28	48-869642	NPN; type M9642
Q29	48-869643	PNP; type M9643
Q30 thru 37	48-869642	NPN; type M9642
Q38	48-869643	PNP; type M9643
Q39, 40, 41	48-869642	NPN; type M9642
Q42, 43, 44	48-869642	NPN; type M9642 (2-freq. models only)
Q45, 46	48-869567	NPN; type M9567 (2-freq. models only)
Q48	48-869642	NPN; type M9642
Q49	48-869642	NPN; type M9642 ("PL" models only)
Q50	48-869643	PNP; type M9643 ("PL" models only)
Q51, 52	48-869642	NPN; type M9642 ("PL" models only)
Q53, 54	48-869643	PNP; type M9643
Q55 thru 58	48-869648	NPN; type M9648
Q59	48-869649	PNP; type M9649
		RESISTOR, fixed: ±10%; 1/4 W; unless otherwise stated
R17	18-83083G39	variable; 25k
R18	6-124D18	680k
R19	6-124C59	2.7k
R20	6-124D14	470k
R21	6-124C35	270
R22	6-124C83	27k
R23	6-124B02	150k ±5%
R24, 25	6-124A79	18k ±5%
R26	6-124B02	150k ±5%
R27, 28	6-124C41	470
R29, 30	6-124A57	2.2k ±5%
R31, 32	6-124C17	47
R33	6-124C51	1.2k
R34	6-124B06	220k ±5%
R35	6-124A85	33k ±5%
R36	6-124A93	68k ±5%
R37	6-124C73	10k
R38	6-124B14	470k ±5%
R39	6-124A77	15k ±5%
R40	6-124D22	1 meg
R41	6-124C37	330
R42	6-124A45	680 ±5%
R44	6-124C89	47k
R45, 46	6-124C61	3.3k
R47	6-124C49	1k
R48	6-124C83	27k
R49, 50	6-124C85	33k
R51	6-124C49	1k
R52	6-124C97	100k
R53	18-83083G39	variable; 25k
R54	6-124C49	1k
R55	6-124C85	33k
R56	6-124C93	68k
R57	6-124C25	100
R58	6-124C67	5.6k
R59	6-124C55	1.8k
R61	6-124C83	27k
R62	6-124D22	1 meg
R63	6-124C91	56k
R64	6-124C73	10k
R65	6-124D22	1 meg
R66	6-124C73	10k
R67	6-124C69	6.8k
R68	6-124C83	27k
R69	6-124C95	82k
R70	6-124C43	560
R71	6-124C51	1.2k
R72	6-124C19	56
R73	6-124C53	1.5k
R74	6-124C73	10k
R75	6-124C69	6.8k
R76	6-124C01	10
R77	6-125C25	100; 1/2 W
R79	6-124C57	2.2k
R80	6-124C69	6.8k
R81	6-124C81	22k
R82	6-124B06	220k ±5%
R83	6-124A97	100k ±5%
R84	6-124A49	1k ±5%
R85	6-124A73	10k ±5%
R86	6-124C81	22k
R87	6-124A77	15k ±5%
R88	6-124A61	3.3k ±5%
R89	6-124B18	680k ±5%
R90	6-124B02	150k ±5%
R91	6-124A73	10k ±5%
R92	6-124A45	680 ±5%
R93	6-124B18	680k ±5%
R94	6-124B08	270k ±5%
R95	6-124A73	10k ±5%
R96	6-124A41	470 ±5%
R97	6-124C45	680
R98	6-125C37	330; 1/2 W
R99	6-124C53	1.5k
R100	6-124A13	33 ±5%
R101	6-124A93	68k ±5%
R102	6-124A83	27k ±5%
R103	6-124A01	10 ±5%
R104	6-124C89	47k
R105	6-124A57	2.2k ±5%
R106	6-124A33	220 ±5%
R107	6-124C99	120k
R108	6-125C97	100k; 1/2 W
R109	6-124C81	22k
R110	6-124C93	68k
R111	6-124C73	10k
R112	6-124C89	47k
R113	6-124C95	82k
R114	6-124C57	2.2k
R115	6-124C49	1k
R116	6-124A57	2.2k ±5%
R117	6-124A37	330 ±5%
R118	6-124C75	12k
R119	6-124C61	3.3k
R120	6-124A51	1.2k ±5%
R121	6-124C13	33
R122	6-124A93	68k ±5%
R123	6-124A83	27k ±5%
R124	6-124A11	27 ±5%
R125	6-124A49	1k ±5%
R126	6-124C75	12k
R127	6-124C13	33
R128	6-124C75	12k
R129	6-124C61	3.3k
R130	6-124A57	2.2k ±5%
R131	6-124A35	270 ±5%
R132	6-124C89	47k
R133	6-124C65	4.7k
R134	6-124C57	2.2k
R135	6-124C25	100
R136	6-125C49	1k; 1/2 W
R137	6-124C25	100
R138	6-124C61	3.3k
R139	6-124C89	47k
R140	6-124A73	10k ±5%
R141, 142	6-124C89	47k
R143	6-124C93	68k
R144, 145	6-124C81	22k
R146	6-124C93	68k
R147	6-124C89	47k
R148, 149	6-124C57	2.2k
R150	6-124C49	1k
R151	6-124C61	3.3k
R152	6-125C49	1k; 1/2 W
R153	6-124C49	1k
R154	6-124A63	3.9k ±5%
R155	6-124C49	1k
R156	6-124A57	2.2k ±5%
R157	6-124A25	100 ±5%
R158	6-124A57	2.2k ±5%
R159	6-124C73	10k
R160	6-124A57	2.2k ±5%
R161	6-124A49	1k ±5%
R162	6-124A09	22 ±5%
R163	6-124A93	68k ±5%
R164	6-124A83	27k ±5%
R165	6-124A37	330 ±5%
R166	6-124C43	560
R167	6-124C93	68k
R168	6-124A09	22 ±5%
R169	6-124A49	1k ±5%
R170	6-124C81	22k
R171	6-124A33	220 ±5%
R172	6-124A49	1k ±5%
R173	6-124A57	2.2k ±5%
R174	6-124C01	10
R175	6-124C57	2.2k
R176	6-124A79	18k ±5% (2-freq. models only)
R177	6-124C33	220 (2-freq. models only)
R178	6-124A53	1.5k ±5% (2-freq. models only)
R179	6-124A59	2.7k ±5% (2-freq. models only)
R180	6-124C51	1.2k (2-freq. models only)
R181	6-124C65	4.7k (2-freq. models only)
R183	6-124C65	4.7k (2-freq. models only)
R185	6-124A61	3.3k ±5% (2-freq. models only)
R186	6-124C65	4.7k (2-freq. models only)
R187	6-124C51	1.2k (2-freq. models only)
R188	6-124C49	1k (2-freq. models only)
R189, 190	6-124C61	3.3k (2-freq. models only)
R191	6-124C49	1k (2-freq. models only)
R192	6-124A83	27k ±5%
R194	6-124A63	3.9k ±5%
R195	6-124C57	2.2k
R196	6-124A83	27k ±5% ("PL" models only)
R197	6-124A35	270 ±5% ("PL" models only)
R198	6-124A53	1.5k ±5% ("PL" models only)
R199	6-124A59	2.7k ±5% ("PL" models only)
R200	6-124A57	2.2k ±5% ("PL" models only)
R201	6-124A81	22k ±5% ("PL" models only)
R202	6-124C73	10k ("PL" models only)
R203, 204	6-124C69	6.8k ("PL" models only)
R205, 206	6-124C73	10k ("PL" models only)
R207	6-124C97	100k ("PL" models only)
R208	6-124A73	10k ±5% ("PL" models only)
R209	6-124C65	4.7k ("PL" models only)
R210	6-124C65	4.7k
R211	6-124A41	470 ±5%
R212	6-124A51	1.2k ±5%
R213	6-124C65	4.7k
R214	6-124C43	560
R215	6-124C57	2.2k
R216	6-124C65	4.7k
R217	6-124C61	3.3k
R218	6-124C89	47k
R219	6-124A33	220 ±5%
R220	6-124C49	1k
R221	6-126C41	470; 1 W
R222, 223	6-124C73	10k
R224	6-124C65	4.7k
R225	6-126C41	470; 1 W
R226	6-124C53	1.5k
R227	6-124C81	22k
R228	6-124C67	5.6k (2-freq. models only)
R229	6-124C59	2.7k (2-freq. models only)
R230	6-124C81	22k ("PL" models only)
R231	6-124C89	47k
R232	6-124A49	1k ±5%
R233	6-124C35	270
		TRANSFORMER:
T1, 2	25-82866K01	primary; pins 2 and 3: res. 40 ohms; secondary #1; pins 4 and 5: res. 1570 ohms; secondary #2; pins 6 and 8: res. 85 ohms
		VOLTAGE REGULATOR:
VR1	48-82256C26	Zener type; 3.3 V
VR2	48-82256C33	Zener type; 2.7 V
		MECHANICAL PARTS
	3-138162	SCREW, tapping 4-40 x 3/8"; 6 used
	42-84284B01	RETAINER; 6 used
	42-84315A01	CLIP, ground (for L1)
	7-82812M01	BRACKET, pivot (RH)
	7-82812M02	BRACKET, pivot (LH)
	29-84547B04	PIN, contact; 40 used

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

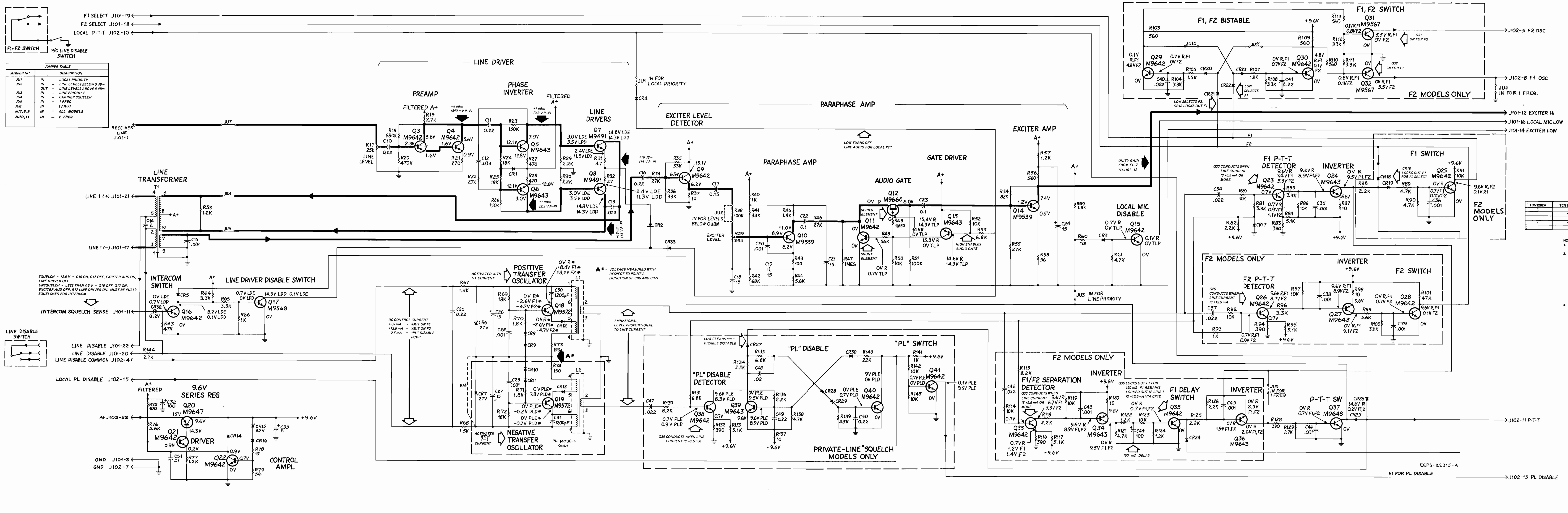
TONE REMOTE CONTROL

MODELS TCN1217A, TCN1218A, TCN1219A

SHOWN FROM SOLDER SIDE

DC REMOTE CONTROL

MODELS TCN1214A, TCN1215A, TCN1216A



MODEL COMPLEMENT

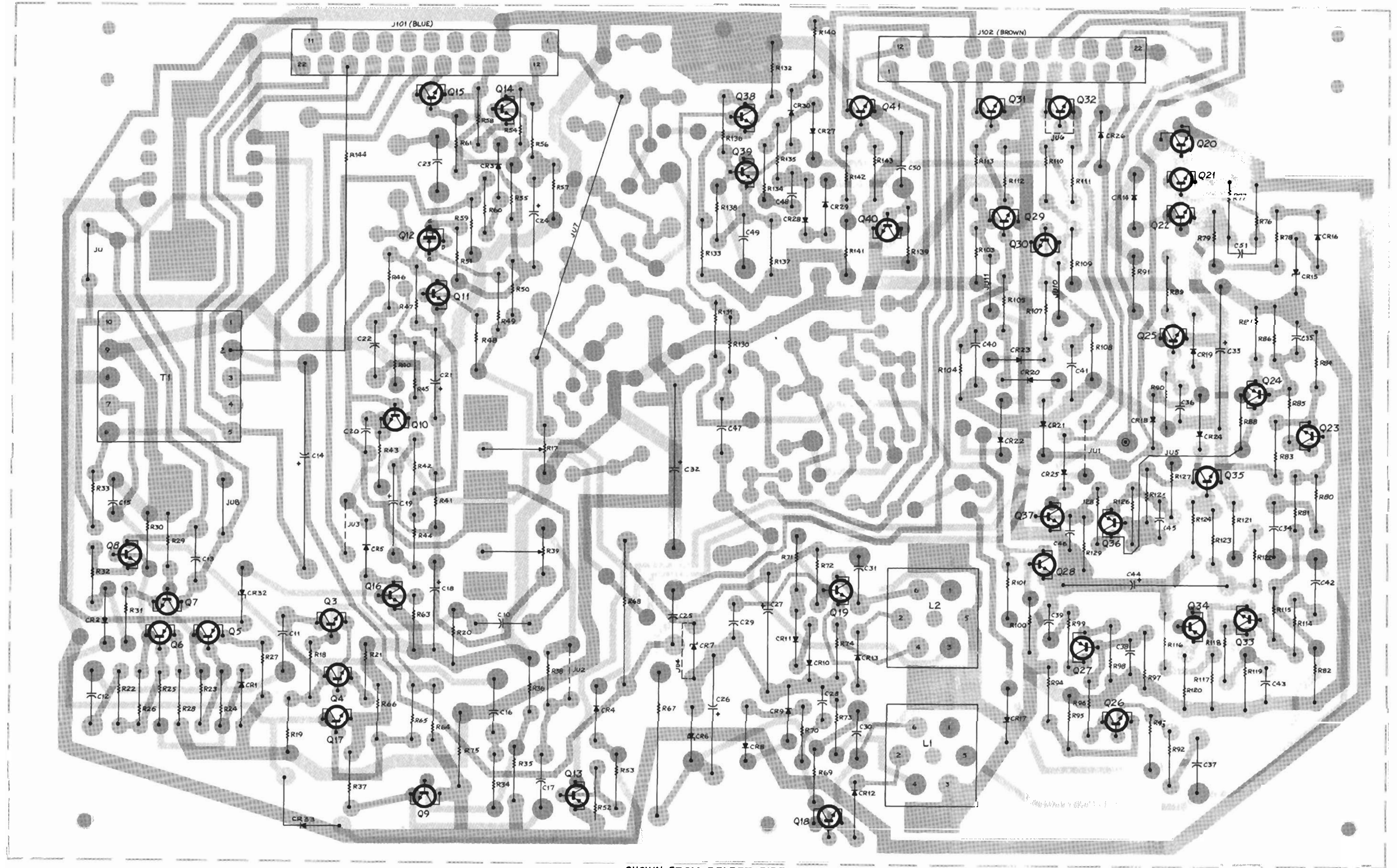
TCN1202A	TCN1203A	TCN1204A	UNIT
1			TRN6739A DC CONTROL BOARD, 1–FREQ CARRIER SQ
	1		TRN6740A DC CONTROL BOARD, 1–FREQ "PL"
		1	TRN6741A DC CONTROL BOARD, 2–FREQ "PL"
1	1	1	TRN6300A HARDWARE KIT

NOTES:
1. UNLESS OTHERWISE INDICATED, CAPACITORS ARE IN MICRO–FARADS.
2. TRANSISTOR VOLTAGES MEASURED WITH A MOTOROLA DC MULTIMETER (11 MEGOHM INPUT IMPEDANCE) OR EQUIVALENT ABBREVIATIONS FOR MEASUREMENT CONDITIONS ARE AS FOLLOWS:
   - F1 = TRANSMITTER KEYED ON F1
   - F2 = TRANSMITTER KEYED ON F2
   - LDD = LINE DRIVER DISABLED
   - LDE = LINE DRIVER ENABLED
   - PLD = PL DISABLED
   - PLE = PL ENABLED
   - R = RECEIVE OR STANDBY
   - TLP = TRANSMITTER KEYED (LINE PRIORITY)
3. LINE DRIVER STAGE GAIN MEASUREMENTS MADE WITH –11 dBm ON THE RECEIVER LINE INPUT.

LEGEND:
- = THEORY OF OPERATION DATA
- = MAINTENANCE DATA
- = PRIMARY SIGNAL FLOW
- = SECONDARY SIGNAL FLOW

FUNCTION

In DC controlled remote control stations and local-remote control stations, permits the station to be remotely controlled via a two-wire telephone type line. Contains DC transfer oscillators and switching circuits which convert dc control currents, from the remote control point, into control signals for operation of the "Consolette" control station. Also provides all necessary amplifier and gating circuits for control of transmit and receive audio. Model TCN1214A is used in one-frequency carrier squelch stations, Model TCN1215A is used in one-frequency "Private-Line" squelch stations, and Model TCN1216A is used in two-frequency "Private-Line" squelch stations.



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OL-EEPS-22316-A

PARTS LIST

TRN6183A Remote Multi-frequency Switch Kit
TRN6745A Multi-frequency Switch Kit — PL-5241-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		SWITCH:
S102	40-82969K01	rotary; 5 contact (TRN6745A)
	40-83304G01	rotary; 12 contact (TRN6183A)
		MECHANICAL PARTS
	36-82869K01	KNOB
	42-10217A01	STRAP, cable harness; 4 used
	64-83071G77	PANEL INSERT (TRN6745A)
	39-10184A24	CONTACT, chain-form; 2 used
	64-83071G76	PANEL INSERT (TRN6183A)

TRN6299A Hardware Kit (tone remote)
TRN6300A Hardware Kit (dc remote) — PL-5233-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
	2-7005	NUT, 6-32 x 1/4 x 3/32" hex; 2 used
	3-134186	SCREW, tapping; 6-32 x 5/16"; 2 used
	3-134212	SCREW, tapping; 4-40 x 5/16"; 2 used
	4-7569	WASHER, flat; .145-.312.027; 2 used
	7-83279K01	BRACKET, rear (TRN6299A)
	14-84023K01	INSULATOR
	43-84028C05	SPACER (TRN6300A)

TRN6739A/TRN6704A/TRN6741A
DC Remote Control Board — PL-5252-A

This parts lists covers three models of the DC Remote Control Board. Where differences exist the model number of the applicable unit is given in the Description column.

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		CAPACITOR, fixed: uF ±10%; 50 V unless otherwise stated
C10, 11	8-82905G11	0.22
C12, 13	8-82905G08	.033
C14	8-82045F05	2; 350 V
C15	21-82187B29	.001; 100 V
C16	8-82905G11	0.22
C17	8-82905G05	0.15
C18, 19	23-865136	15 ±20%; 25 V
C20	21-82187B29	.001; 100 V
C21	23-865136	15 ±20%; 25 V
C22, 23	8-82905G07	0.1
C24	23-865136	15 ±20%; 25 V
C25	8-82905G11	0.22
C26	23-83210A18	15 +150-10%
C27	23-83210A18	15 +150-10% (TRN6740A & TRN6741A)
C28	21-82187B29	.001; 100 V
C29	21-82187B29	.001; 100 V (TRN6740A & TRN6741A)
C30	21-874352	1200 pF ±5%; 300 V
C31	21-874352	1200 pF ±5%; 300 V (TRN6740A & TRN6741A)
C32	23-82601A19	100 +60-0%; 25 V
C33	23-82601A11	5 +33-10%; 25 V
C34	8-82905G02	.022
C35, 36	21-82187B29	.001; 100 V
C37	8-82905G02	.022 (TRN6741A)
C38, 39	21-82187B29	.001; 100 V (TRN6741A)
C40	8-82905G02	.022 (TRN6741A)
C41	8-82905G11	0.22 (TRN6741A)
C42	8-82905G02	.022 (TRN6741A)
C43	21-82187B29	.001; 100 V (TRN6741A)
C44	23-82601A19	100 +60-9%; 25 V (TRN6741A)
C45	21-82187B29	.001; 100 V (TRN6741A)
C46	21-82187B29	.001; 100 V
C47	8-82905G02	.022 (TRN6740A & TRN6741A)
C48	21-82428B26	.02 +80-20%; 200 V (TRN6740A & TRN6741A)
C49, 50	8-82905G11	0.22 (TRN6740A & TRN6741A)
C51	21-82428B59	.01 +80-20%; 200 V
		DIODE: (SEE NOTE)
CR1 thru 5	48-83654H01	silicon
CR6	48-83461E12	zener; 27 V
CR7	48-83461E12	zener; 27 V (TRN6740A & TRN6741A)
CR8, 9	48-83654H01	silicon
CR10, 11	48-83654H01	silicon (TRN6740A & TRN6741A)
CR12	48-83654H01	silicon
CR13	48-83654H01	silicon (TRN6740A & TRN6741A)
CR14	48-83654H01	silicon
CR15	48-82256C16	zener; 8.2 V
CR16, 17	48-83654H01	silicon
CR18 thru 24	48-83654H01	silicon (TRN6741A)
CR25, 26	48-83654H01	silicon
CR27 thru 30	48-83654H01	silicon (TRN6740A & TRN6741A)
CR31	48-82466H13	silicon
CR32	48-82256C16	zener; 8.2 V
CR33	48-83654H01	silicon
		COIL:
L1	24-83008H01	oscillator
L2	24-83008H01	oscillator (TRN6740A & TRN6741A)
		TRANSISTOR: (SEE NOTE)
Q3, 4	48-869642	NPN; type M9642
Q5, 6	48-869643	PNP; type M9643
Q7, 8	48-869491	NPN; type M9491
Q9	48-869642	NPN; type M9642
Q10	48-869539	NPN; type M9539
Q11	48-869642	NPN; type M9642
Q12	48-869660	FET; type M9660
Q13	48-869643	PNP; type M9643
Q14	48-869539	NPN; type M9539
Q15, 16	48-869642	NPN; type M9642
Q17	48-869568	NPN; type M9568
Q18	48-869572	NPN; type M9572
Q19	48-869572	NPN; type M9572 (TRN6740A & TRN6741A)
Q20	48-869647	PNP; type M9647
Q21, 22, 23	48-869642	NPN; type M9642
Q24	48-869643	PNP; type M9643
Q25	48-869642	NPN; type M9642
Q26	48-869642	NPN; type M9642 (TRN6741A)
Q27	48-869643	PNP; type M9643 (TRN6741A)
Q28, 29, 30	48-869642	NPN; type M9642 (TRN6741A)
Q31, 32	48-869567	NPN; type M9567 (TRN6741A)
Q33	48-869642	NPN; type M9642 (TRN6741A)
Q34	48-869643	PNP; type M9643 (TRN6741A)
Q35	48-869642	NPN; type M9642 (TRN6741A)
Q36	48-869643	PNP; type M9643 (TRN6741A)
Q37	48-869648	NPN; type M9648
Q38	48-869642	NPN; type M9642 (TRN6741A)
Q39	48-869643	PNP; type M9643 (TRN6741A)
Q40, 41	48-869642	NPN; type M9642 (TRN6741A)
		RESISTOR, fixed: ±10%; 1/4 W; unless otherwise stated
R17	18-83083G24	variable; 25 k ±30%
R18	6-124D18	680k
R19	6-124C59	2.7k
R20	6-124D14	470k
R21	6-124C35	270
R22	6-124C83	27k
R23	6-124B02	150k ±5%
R24, 25	6-124A79	18k ±5%
R26	6-124B02	150k ±5%
R27, 28	6-124A41	470 ±5%
R29, 30	6-124A57	2.2k ±5%
R31, 32	6-124A17	47 ±5%
R33	6-124C51	1.2k
R34	6-124C83	27k
R35, 36	6-124C85	33k
R37	6-124C49	1k
R38	6-124C97	100k
R39	18-83083G24	variable; 25 k ±30%
R40	6-124C49	1k
R41	6-124C85	33k
R42	6-124C93	68k
R43	6-124C25	100
R44	6-124C67	5.6k
R45	6-124C55	1.8k
R46	6-124C83	27k
R47	6-124D22	1 meg
R48	6-124C91	56k
R49	6-124D22	1 meg
R50	6-124C73	10k
R51	6-124C97	100k
R52	6-124C73	10k
R53	6-124C69	6.8k
R54	6-124C95	82k
R55	6-124C83	27k
R56	6-124C43	560
R57	6-124C51	1.2k
R58	6-124C19	56
R59	6-124C55	1.8k
R60	6-124C75	12k
R61	6-124C65	4.7k
R63	6-124C89	47k
R64, 65	6-124C61	3.3k
R66	6-124C49	1k
R67	17-83027H03	wirewould, 1.5k; 3 W
R68	17-83027H03	wirewould, 1.5k; 3 W (TRN6740A & TRN6741A)
R69	6-124C79	18k
R70	6-124C55	1.8k
R71	6-124C55	1.8k (TRN6740A & TRN6741A)
R72	6-124C79	18k (TRN6740A & TRN6741A)
R73	6-124A29	150 ±5%
R74	6-124A29	150 ±5% (TRN6740A & TRN6741A)
R75	6-125C25	100; 1/2 W
R76	6-124C67	5.6k
R77	6-124C51	1.2k
R78	6-124A05	15 ±5%
R79	6-124A19	56 ±5%
R80	6-124A73	10k ±5%
R81	6-124A61	3.3k ±5%
R82	6-124C57	2.2k
R83	6-124A39	390 ±5%
R84	6-124A66	5.1k ±5%
R85	6-124C61	3.3k
R86	6-124C73	10k
R87	6-124C01	10
R88	6-124C57	2.2k
R89, 90	6-124C65	4.7k
R91	6-124C73	10k
R92	6-124A73	10k ±5% (TRN6741A)
R93	6-124A49	1k ±5% (TRN6741A)
R94	6-124A39	390 ±5% (TRN6741A)
R95	6-124A66	5.1k ±5% (TRN6741A)
R96	6-124C61	3.3k
R97	6-124C73	10k (TRN6741A)
R98	6-124C01	10 (TRN6741A)
R99	6-124C67	5.6k (TRN6741A)
R100	6-124C85	33k (TRN6741A)
R101	6-124C89	47k (TRN6741A)
R103	6-124C43	560 (TRN6741A)
R104	6-124C61	3.3k
R105	6-124C53	1.5k (TRN6741A)
R107	6-124C55	1.8k (TRN6741A)
R108	6-124C61	3.3k
R109, 110	6-124C43	560 (TRN6741A)
R111, 112	6-124C61	3.3k
R113	6-124C43	560 (TRN6741A)
R114	6-124A73	10k ±5%
R115	6-124A71	8.2k ±5%
R116	6-124A39	390 ±5%
R117	6-124A66	5.1k ±5%
R118	6-124C57	2.2k (TRN6741A)
R119	6-124C73	10k (TRN6741A)
R120	6-124C01	10 (TRN6741A)
R121	6-124C65	4.7k (TRN6741A)
R122	6-124A51	1.2k ±5% (TRN6741A)
R123	6-124A73	10k ±5% (TRN6741A)
R124	6-124A51	1.2k ±5% (TRN6741A)
R125, 126	6-124C57	2.2k (TRN6741A)
R128	6-125C39	390; 1/2 W
R129	6-124C59	2.7k
R130	6-124A71	8.2k±5% (TRN6740A &TRN6741A)
R131	6-124A69	6.8k ±5% (TRN6740A & TRN6741A)
R132	6-124A39	390 ±5% (TRN6740A & TRN6741A)
R133	6-124A66	5.1k ±5% (TRN6740A & TRN6741A)
R134	6-124C61	3.3k (TRN6740A & TRN6741A)
R135	6-124C69	6.8k (TRN6740A & TRN6741A)
R136	6-124C57	2.2k (TRN6740A & TRN6741A)
R137	6-124C01	19 (TRN6740A & TRN6741A)
R138	6-124C65	4.7k (TRN6740A & TRN6741A)
R139	6-124C61	3.3k (TRN6740A & TRN6741A)
R140	6-124C81	22k (TRN6740A & TRN6741A)
R141	6-124C49	1k (TRN6740A & TRN6741A)
R142, 143	6-124C81	22k (TRN6740A & TRN6741A)
R144	17-82177B24	wirewound, 2.7k; 3 W
		TRANSFORMER:
T1	25-83000H01	primary; dc res: leads 2 & 3: 25 ohms; leads 4 & 5: 25 ohms; secondary; dc res: leads 6 & 10; 50 ohms; leads 7 & 9; 190 ohms
		MECHANICAL PARTS
	26-858660	SHIELD, coil; 2 used
	42-84284B01	RETAINER; 4 used

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

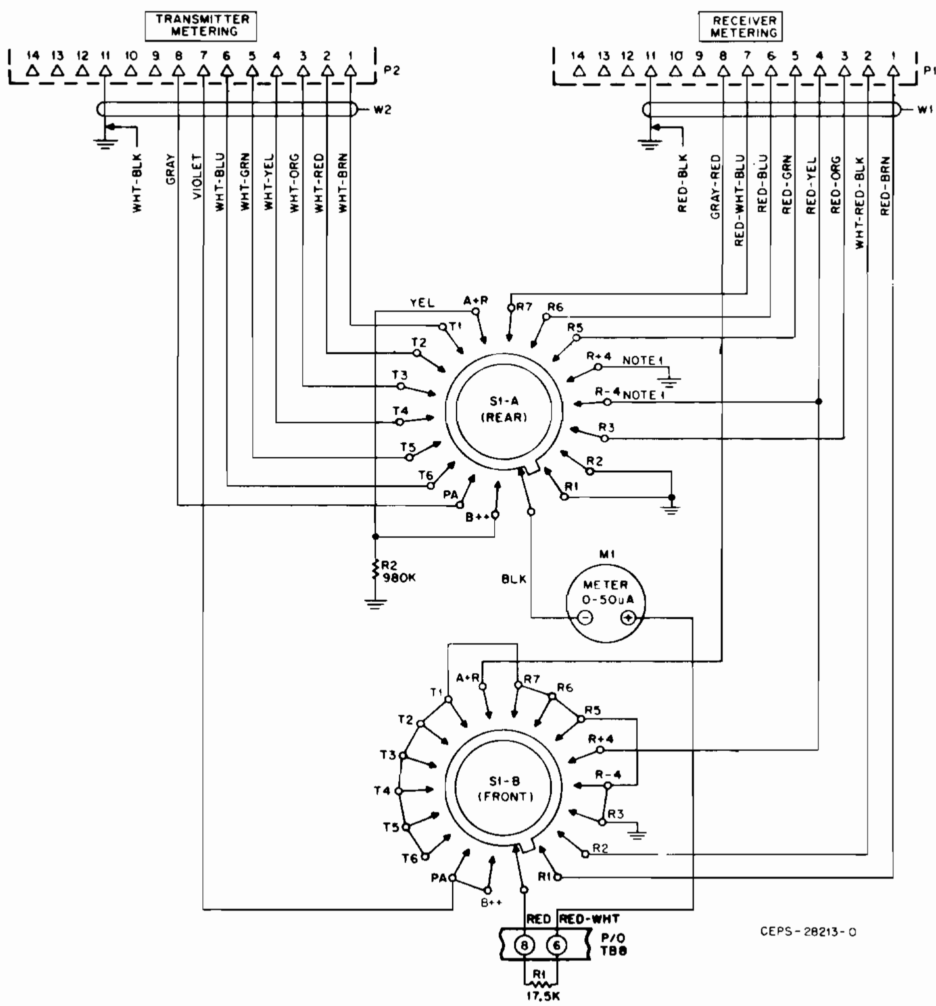
MOTOROLA INC.
Communications
Group

DC METER

MODEL HLN4138A

DESCRIPTION

The meter and switch permit measurement and selection of various test points in the receiver and transmitter circuits. The specific circuits to be measured are connected to the either via receptacles on the receiver and transmitter chassis. The meter is mounted in the front panel space reserved for a meter so that either the dc meter or the vu meter may be used, but not both.



NOTES

1 WHEN USING THIS KIT IN THE STANDARD OPERATION OF THE BASE STATION, METER R-4 OR R+4 CANNOT BE READ

2. WHEN SERVICING THE BASE STATION, METER R-4 OR R+4 CAN BE ENABLED, ONLY TO SET THE FREQUENCY, BY JUMPERING THE TWO METER 4 PINS TOGETHER IN THE RADIO SET. THE FRONT PANEL SWITCH (S1) CAN BE USED TO SELECT EITHER POSITION AS FOLLOWS:

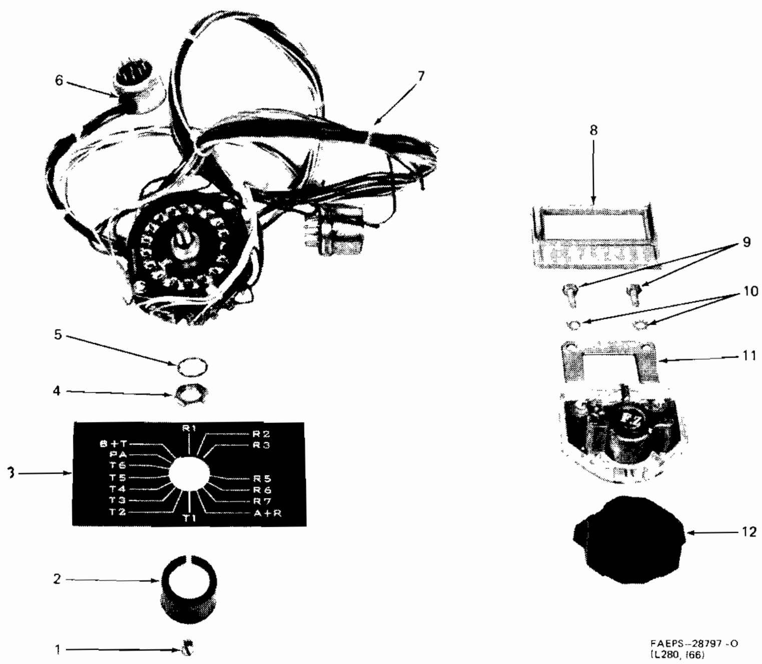
R3	
R-4	BLANK
R+4	ON
R5	PANEL

3 AFTER SERVICING, JUMPER MUST BE REMOVED FROM THE TWO METER 4 PINS

parts list

HLN4138A DC Metering Kit PL-6663-O

REFERENCE SYMBOL/CODE	MOTOROLA PART NO.	DESCRIPTION
		ammeter, dc:
M1	72-83319G01	00-50 uA; internal resistance 2560 ohms ± 10%
		connector:
P1		includes: 28-864669 plug, male, 12-contact; 15-82798H01 shell, plug, plated
P2		includes: 28-864669 plug, male, 12-contact; 15-82798H01 shell, plug, plated
		resistor, fixed; ohms; ± 2%; 1/2 W; unless otherwise stated
R1	6-855337	17.5k
R2	6-811974	980k
		switch, rotary:
S1	40-83106B01	2-section; each section single pole; 18-position, non-shorting
		cable, assembly:
W1 & W2	1-80703T17	laced, dc metering includes:
7	42-10217A02	STRAP, tie; 15 used
		non-referenced items
	1-80703T16	CABLE & SWITCH, dc metering includes: referenced parts P1, P2, R2, S1 and W1 & W2;
	29-83446D01	TERMINAL, pin; 2 used
6	37-10559	GROMMET, rubber; 2 used
4	2-1376	NUT, 3/8"-32 x 1/2" x 3/32"
9	3-3375	SCREW, tapping, 6-20 5/16"; 2 used
10	4-7666	LOCKWASHER, external, #6; 2 used
5	4-7691	LOCKWASHER, internal, 3/8"
12	26-83747G01	SHIELD, meter
1 & 2	36-82869K01	KNOB, includes: 3-7104 set screw, 8-32 x 3/16"
11	42-83155G01	CLIP, meter mounting
3	64-80191B01	PANEL, insert, switch mounting
8	64-83073G08	PANEL, insert, meter mounting



FAEPS-28797-O
(L280, I66)

VU METER

MODEL TLN1734A

FUNCTION --

Provides relative indication of speech level to exciter.

TEST PROCEDURE

Step 1. Connect an audio oscillator between the input lead and ground. Set output level to zero and frequency to 1000 Hz.

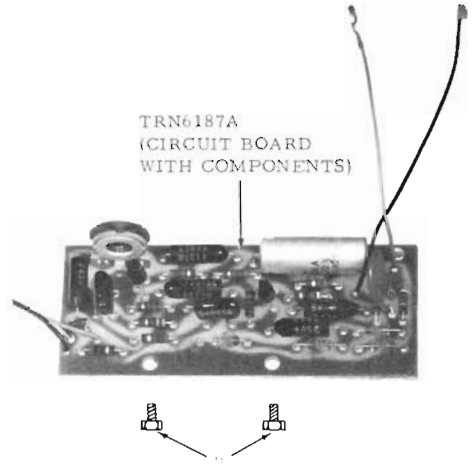
Step 2. Set the variable attenuator control (R2) fully clockwise.

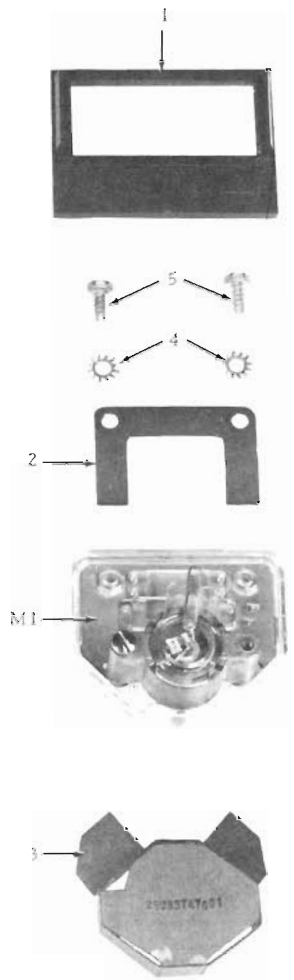
Step 3. Increase the audio oscillator output level until the vu meter indication is 0. The audio oscillator output should be less than 100 mV rms.

If the vu meter circuit sensitivity is low check amplifier stages and the rectifier diodes.

CIRCUIT DESCRIPTION

Audio that is applied through variable attenuator R2 is amplified in a two-stage amplifier, Q1 and Q2. The audio is then rectified in bridge rectifier CR1 through CR4 and the dc output causes a deflection of the meter. Thus the vu meter provides a relative indication of the audio applied to the exciter.





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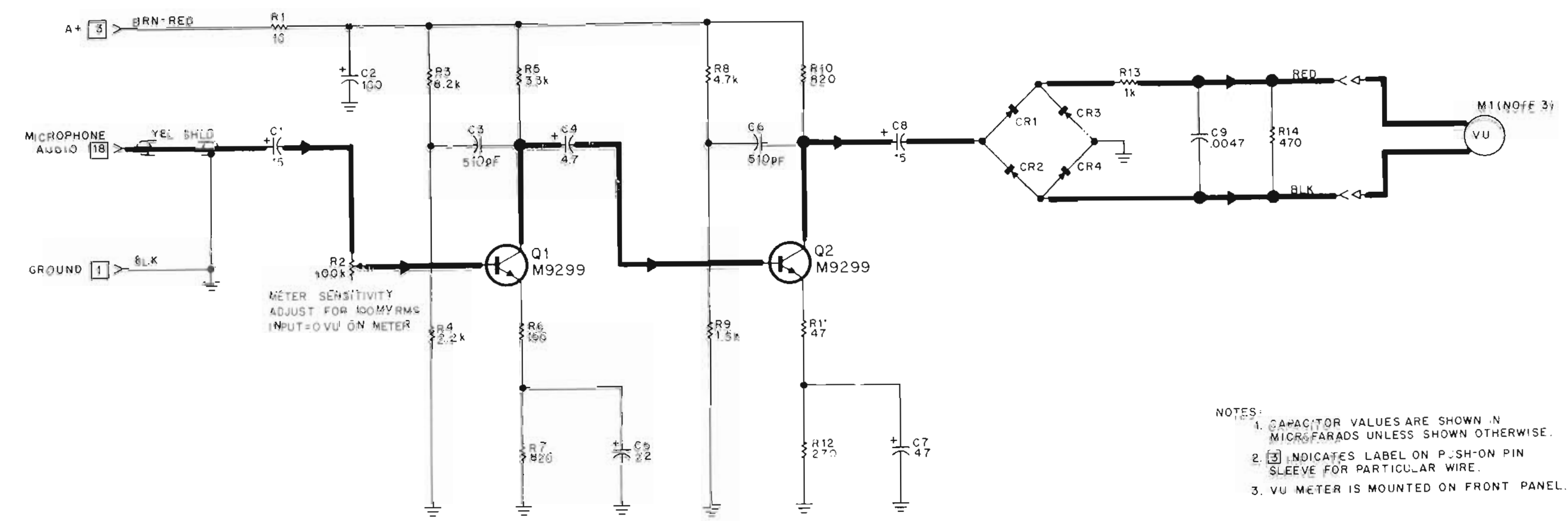

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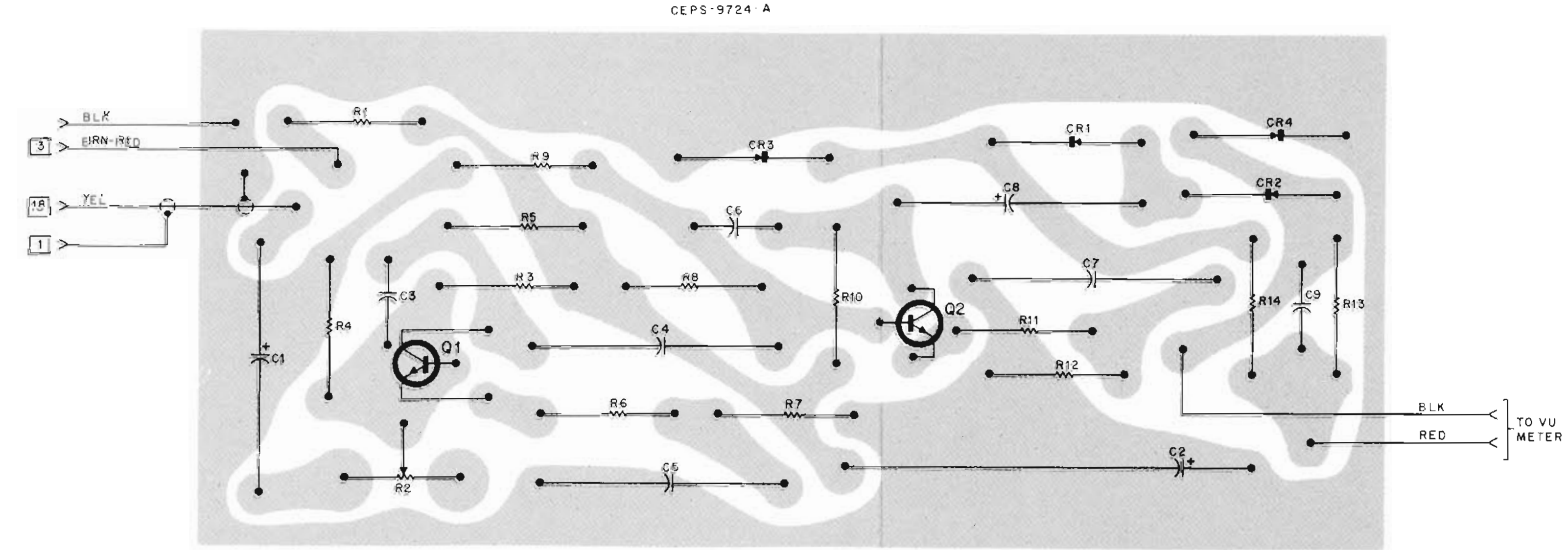

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OL-CEPS-9726-A

PARTS LIST

TRN6187A VU Meter Board Kit (p/o TLN1734A) PL-3320-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		CAPACITOR, fixed: uF; unl. stated
C1	23-83214C02	15 ±20%; 25 V
C2	23-82601A25	100 +150-10%; 20 V
C3	21-845214	510 pF ±5%; 300 V
C4	23-83214C15	4.7 ±20%; 25 V
C5	23-83214C07	22 ±20%; 15 V
C6	21-845214	510 pF ±5%; 300 V
C7	23-83214C10	47 ±20%; 6 V
C8	23-83214C02	15 ±20%; 25 V
C9	21-82428B27	.0047 ±10%; 100 V
		SEMICONDUCTOR DEVICE, diode: (SEE NOTE)
CR1 thru 4	48-82178A04	germanium
		TRANSISTOR: (SEE NOTE)
Q1, 2	48-869299	N-P-N; type M9299
		RESISTOR, fixed: ±10%; 1/4 W
R1	6-124C01	10
R2	18-83083G01	var: 100k
R3	6-124C71	8.2k
R4	6-124C57	2.2k
R5	6-124C61	3.3k
R6	6-124C29	150
R7	6-124C47	820
R8	6-124C65	4.7k
R9	6-124C53	1.5k
R10	6-124C47	820
R11	6-124C17	47
R12	6-124C35	270
R13	6-124C49	1k
R14	6-124C41	470

NOTE: For optimum performance, order by Motorola Part No. only.

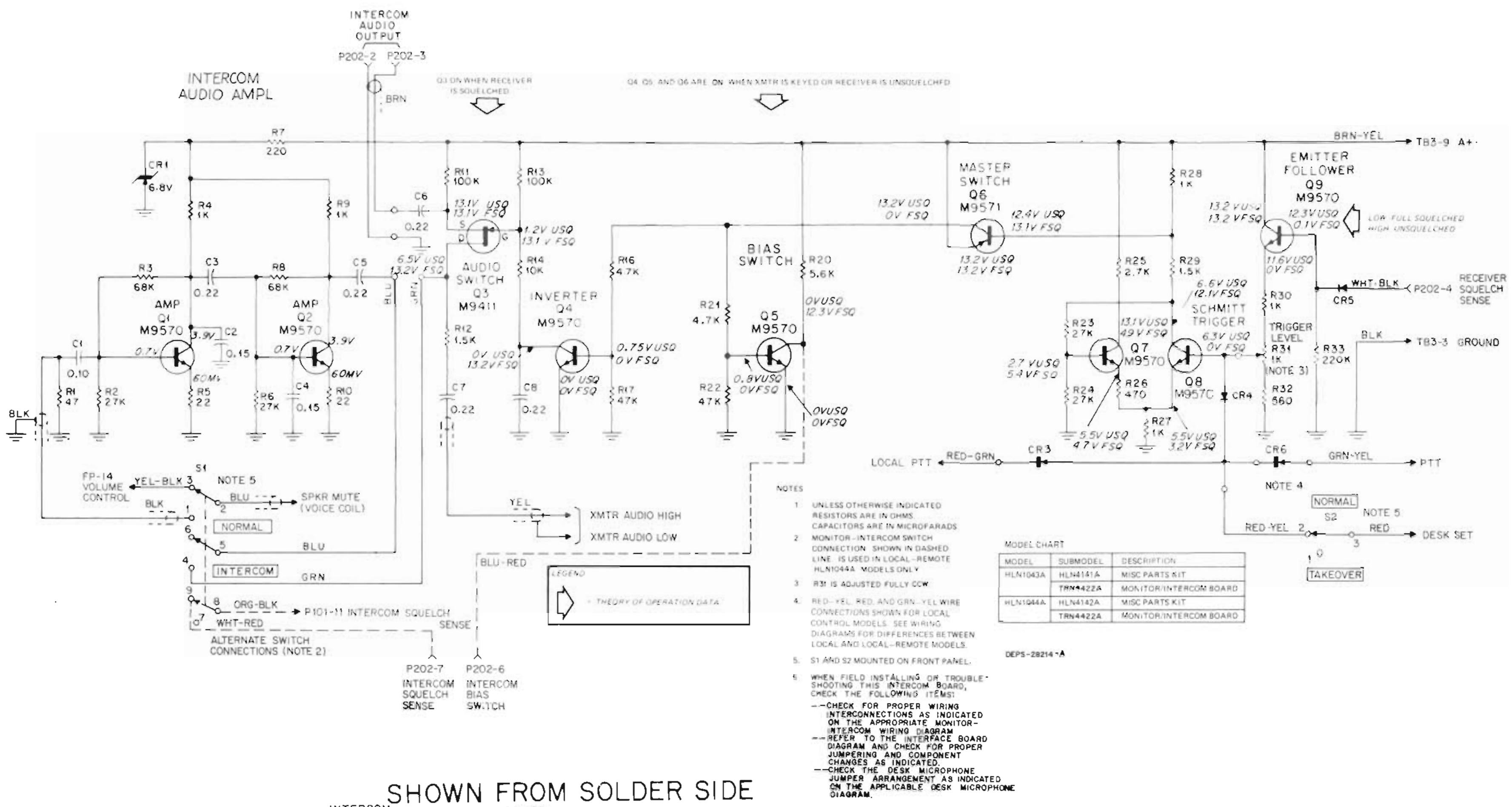
TRN6151A VU Meter and Hardware Kit PL-3321-A

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
	ELECTRICAL PARTS	
M1	72-84969E01	METER, audio level: -20 to +3 VU
	MECHANICAL PARTS	
1	64-83073G08	PANEL, insert meter
2	42-83155G01	CLIP
3	26-83747G01	SHIELD
4	4-7666	LOCKWASHER, #6 external; 2 req'd.
5	3-134168	SCREW, tapping 4-40 x 1/4"; 2 req'd.
6	3-3398	SCREW, tapping 6-32 x 3/8"; 2 req'd.
	NON-REFERENCED ITEMS	
	64-83979M01	PLATE, mounting

MOTOROLA INC. Communications Division
SERVICE PUBLICATIONS 1301 E. ALGONQUIN ROAD SCHAUMBURG, ILLINOIS 60172

MONITOR-INTERCOM

MODEL HLN1043A, HLN1044A



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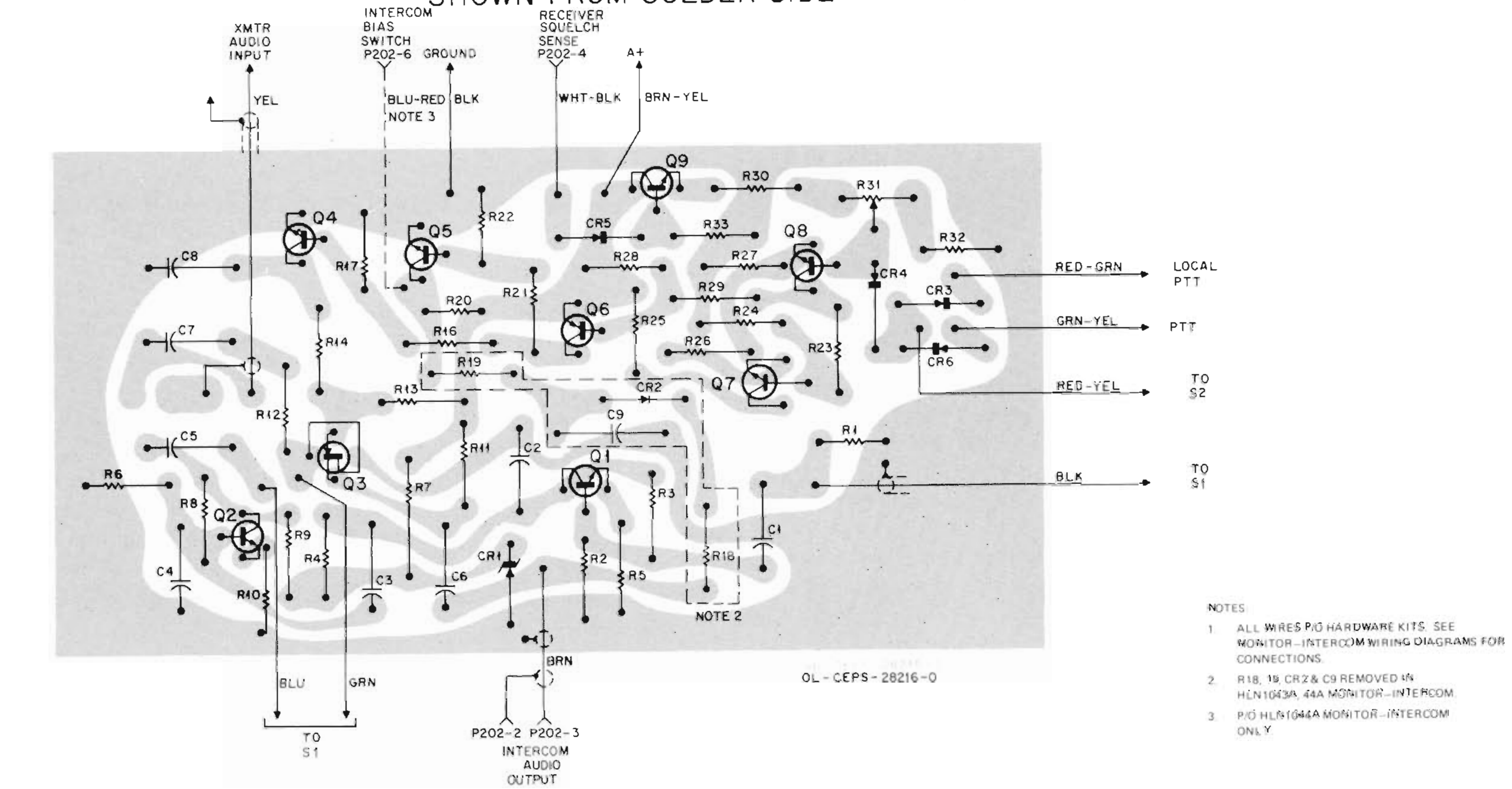


Monitor-Intercom Board Interconnect Chart

Function	Connection Point: Local Control	Connection Point: Local Remote Control
A+	TB3-9	TB3-9
Ground	TB3-3	TB3-3
Intercom Audio Output	P202-3, 2	P202-3, 2
Receiver Squelch Sense	P2024	P2024
Local Mic PTT	TB3-2	TB3-1
Station PTT	TB3-1	NOT USED
Desk Set PTT	TB2-2	TB2-2
Desk Set PTT	Junct. CR3, CR6	TB2-5
Xmit Mon Input	TB3-7, 5	TB3-6, 5
Intercom Bias Switch	NOT USED	P202-6

FUNCTION

This kit adds intercom and supervisory control facilities for operators of local and local-remote control **Mitrek** Super **Consolette** base stations used with parallel connected desk sets. Model HLN1043A, used in local control stations, and Model HLN1044A, used in local-remote stations, provide the following operational characteristics.

- Provisions for the base station operator to monitor all transmissions originated by the desk sets with a supervisory facility to prevent operation of the base station from desk sets.
- Communication between the desk set operators and the base station operator without actuating the transmitter.
- Monitoring of all transmitted and received messages by all local operators.
- A "squelch priority" feature which disables the intercom circuit whenever an on-frequency rf signal is received at the base station.

The monitor-intercom kit allows the use of the base radio as a control point meeting all FCC requirements when local control units are used as dispatch points. Without this kit, each piece of local control equipment which is not within sight of the base station operator must be licensed as a control point.

OPERATING INSTRUCTIONS AND PARTS LIST SHOWN ON BACK

MONITOR–INTERCOM

68P81043E36-A
2-24-84 GGI

parts list

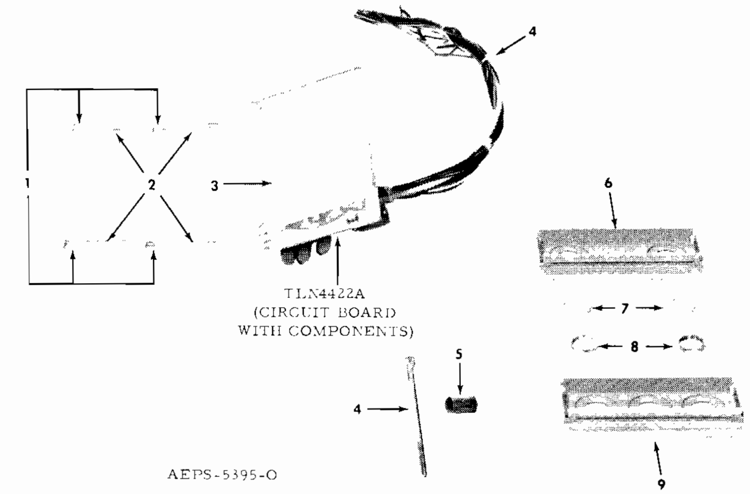
TLN4422A Monitor/Intercom Board Kit — PL-6666-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed: uF ± 10% 50 V; unless otherwise stated
C1	8-82905G07	0.1
C2	8-82905G05	0.15
C3	8-82905G11	0.22
C4	8-82905G05	0.15
C5 thru C8	8-82905G11	0.22
C9	23-865137	4.7 ± 20%; 25 V (not used in HLN1043A, 44A)
		semiconductor device, diode: (see note)
CR1	48-82256C37	Zener 6.8 V
CR2 thru 6	48-83654H01	silicon (CR2 not used in HLN1043A, 44A)
		transistor: (see note)
Q1	48-869570	NPN; M9570
Q2	48-869570	NPN; M9570
Q3	48-869411	N-channel field-effect; M9411
Q4	48-869570	NPN; M9570
Q5	48-869570	NPN; M9570
Q6	48-869571	PNP; M9571
Q7	48-869570	NPN; M9570
Q8	48-869570	NPN; M9570
Q9	48-869570	NPN; M9570
		resistor, fixed ohms; ± 10%; 1/4W: unless otherwise stated
R1	6-124C17	47
R2	6-124C83	27k
R3	6-124C93	68k
R4	6-124C49	1k
R5	6-124C09	22
R6	6-124C83	27k
R7	6-125C33	220; 1/2 W
R8	6-124C93	68k
R9	6-124C49	1k
R10	6-124C09	22
R11	6-124C97	100k
R12	6-124C53	1.5k
R13	6-124C97	100k
R14	6-124C73	10k
R15		NOT USED
R16	6-124C65	4.7k
R17	6-124C89	47k
R18	6-124C81	22k (NOT USED in HLN1043A, 44A)
R19	6-124C81	22k (NOT USED in HLN1043A, 44A)
R20	6-124C67	5.6k
R21	6-124C65	4.7k
R22	6-124C89	47k
R23	6-124C83	27k
R24	6-124C83	27k
R25	6-124A59	2.7k ± 5%
R26	6-124A41	470 ± 5%
R27	6-124A49	1k ± 5%
R28	6-124A49	1k ± 5%
R29	6-124A53	1.5k ± 5%
R30	6-124C49	1k
R31	18-83083G28	variable; 1k ± 20%
R32	6-124C43	560
R33	6-124D06	220k

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

HLN4141A Miscellaneous Parts Kit (Local)
HLN4142A Miscellaneous Parts Kit (Local/Remote) — PL-6667-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		connector, plug:
P202	15-83498F15	housing, female, WHITE, 7-contact
		switch:
S1	40-83303G04	level, 2-form "C" contacts, non-locking (HLN4141A only)
	or 40-83303G10	level, 3-form "C" contacts, non-locking (HLN4142A only)
	[illegible]-83303G02	level, 1-form "B" contact, locking
		non-referenced parts
	1-80703T13	CABLE & SWITCH, monitor-intercom, LOCAL (HLN4141A only) includes: referenced part P202; 29-83499F01, terminal, 3 used; 42-10217A02, strap, tie, 10 used
	1-80703T14	CABLE & SWITCH, monitor-intercom, LOCAL/REMOTE (HLN4142A only) includes: referenced part P202; 9-84151B03, receptacle, female (used as P101-11); 29-83499F01, terminal, 6 used; 42-10217A02, strap, tie, 14 used
8	1-8382	NUT, 15/32"-32 x 9/16" x 3/32"; 2 used
	3-125790	SCREW, machine, 4-40 x 5/16"; 4 used (HLN4141A only)
1	3-134184	SCREW, tapping 4-40 x 5/16"; 4 used
7	4-8424	LOCKWASHER, internal, 15/32"; 2 used
3	14-84265C01	INSULATOR, printed circuit board
5	37-132049	TUBING, plastic, heatshrink, 1/4" i.d.; 1" used
4	42-10217A02	STRAP, tie; 4 used
2	43-84115C03	SPACER, threaded; 4 used (HLN4141A only)
9	64-83071G57	PANEL, insert, switch, 3-hole ("PL")
6	64-83071G58	PANEL, insert, switch 2-hole (NON-"PL")



OPERATION

1. TO SET-UP STATION

Step 1. Turn on station and adjust all controls in normal manner.

Step 2. In **Private-Line** stations, place the **Private-Line** disable switch in "PL" OFF position.

Step 3. Turn SQUELCH control fully counterclockwise. Gradually turn control clockwise until receiver is squelched.

Step 4. The NORMAL-TAKEOVER switch should be in the NORMAL position at all times except when complete takeover of the station is required by the local operator. With the switch in the NORMAL position, a desk set operator can intercom to any other desk set and to the base station operator. The base station operator can also intercom to any local control unit operator. The base station operator monitors all transmissions or intercom messages.

Step 5. Place the NORMAL-TAKEOVER switch in the TAKEOVER position to disable the desk set PTT function.

Step 6. On local-remote stations, the LOCAL-REMOTE switch should be in the REMOTE position at all times to permit full operation of the tone or dc remote desk sets. When complete control of the station is required by the local operator, place the switch in the LOCAL position. This will allow the tone or dc remote desk set operator to hear received audio and to use the intercom, but perform no other function. The local operator monitors all transmissions or intercom messages.

2. INTERCOM

To communicate with other parallel-connected operators (desk sets and wallmount units):

Step 1. Press and hold the NORMAL-INTERCOM switch in the INTERCOM position.

Step 2. Speak directly into the front panel speaker. *Do not use the microphone.* Identify the operator being called.

Step 3. Release the switch to hear a reply at the end of the conversation.

Step 4. If a radio transmission is received at the station, the intercom facility is automatically disabled while the message is being received.

3. TO TRANSMIT A RADIO MESSAGE

Operate the PTT switch on the microphone and proceed in the normal manner.

4. TRANSFER OF CONTROL POINT

If the system is equipped with an alternate control point (FCC authorized) and the station is to be left unattended, place the NORMAL-TAKEOVER switch in the NORMAL position. The alternate control point now assumes all supervisory functions.

5. DESK SET AND/OR WALLMOUNT OPERATION (INTERCOM)

To communicate with other desk set operators or the base station operator, lift the handset and speak into the mouthpiece. *Do not operate the PTT switch on the handset.* Identify the operator being called. Replies will be heard from the earpiece without actuation of any switches. Hang up the handset when the conversation is completed.

6. DESK SET AND/OR WALLMOUNT OPERATION (TRANSMISSION OF MESSAGE OR REPLY)

Press the PTT switch on the handset and speak into the mouthpiece. Release the PTT switch to hear a reply.

PAGING OR "QUIK-CALL" CONVERSION KIT

MODEL HLN1045A

1. DESCRIPTION

When a paging signal is initiated by pressing the PAGE pushbutton on the encoder, a relay is energized within the encoder. This relay will remain energized for the duration of the paging signal cycle. A set of contacts on this relay applies a chassis ground from the encoder to the coil of relay K1, in the conversion kit, energizing K1.

With relay K1 energized, the PL code and secondary PTT generators on the PL encoder/decoder board are disabled and PL code transmission is inhibited. A set of relay contacts also applies a ground to the base station push-to-talk input eliminating the need to manually key the transmitter during paging tone transmission.

When the TRANS pushbutton on the encoder is pressed, a chassis ground is applied to the coil of relay K1, in the conversion kit. The sequence of events for this action is the same as previously described once relay K1 is energized. This permits voice transmission to non-PL units. Voice transmission to PL units is made as usual using the desk microphone.

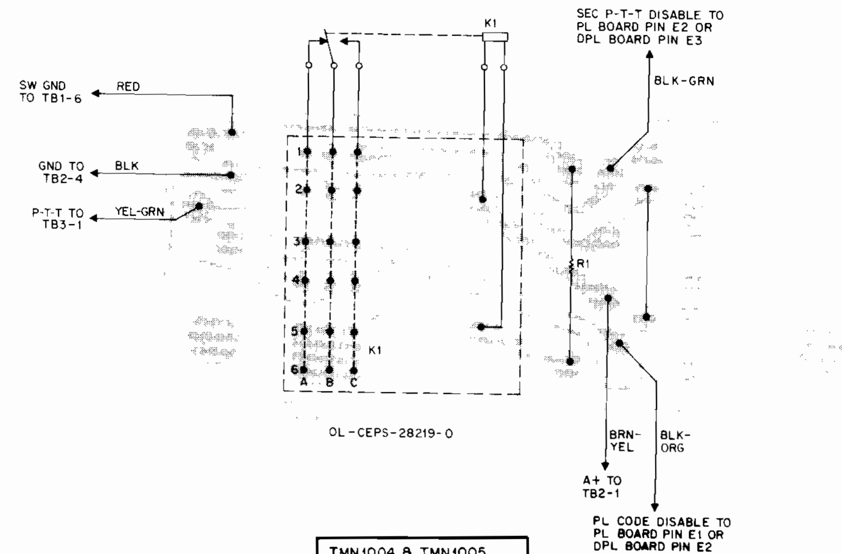
2. OPERATION

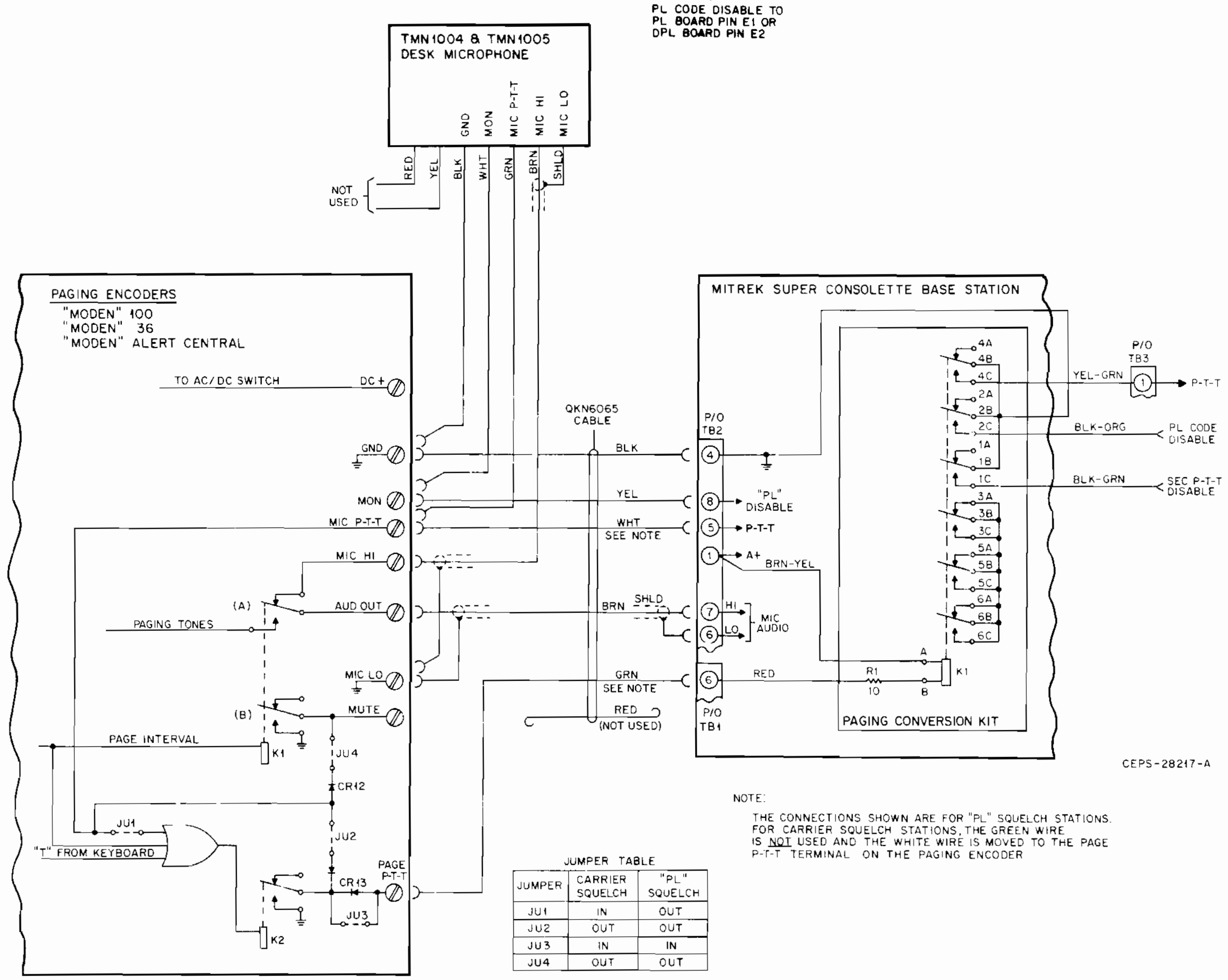
Step 1. Connect power cord to ac outlet.

Step 2. Turn on base station.

Step 3. Turn the SQUELCH control fully counterclockwise and press the monitor switch on the microphone. This disables the tone-coded squelch circuit causing the speaker to emit a rushing noise if the channel is clear. Reset the SQUELCH control.

Step 4. Press the selector button(s) and the PAGE button on the selective paging encoder. The indicator lamp will light and the transmitter will be keyed. The transmisison will not be heard on a **Private-Line** tone-coded squelch receiver since the tone generator in the transmitter is disconnected. However, the pager coded to respond to the paging tones selected by the particular selector button(s) will be activated. Voice cannot be transmitted while the indicator lamp is on, as the microphone is disconnected. Press the TRANS button on the encoder immediately after the indicator lamp is turned on. Keep the transmit button pressed after the lamp turns off and talk into the microphone. The pager will alert and a voice message may be transmitted.





NOTE:
THE CONNECTIONS SHOWN ARE FOR "PL" SQUELCH STATIONS. FOR CARRIER SQUELCH STATIONS, THE GREEN WIRE IS NOT USED AND THE WHITE WIRE IS MOVED TO THE PAGE P-T-T TERMINAL ON THE PAGING ENCODER

JUMPER TABLE

JUMPER	CARRIER SQUELCH	"PL" SQUELCH
JU1	IN	OUT
JU2	OUT	OUT
JU3	IN	IN
JU4	OUT	OUT

FUNCTION

Inhibits transmit "PL" code during paging or "Quik-Call" tone transmissions.

HLN1045A Model Breakdown	
HLN4145A	Paging Board Kit
HLN4146A	Misc. Parts Kit

parts list

HLN4145A Paging Board Kit — PL-6664-O

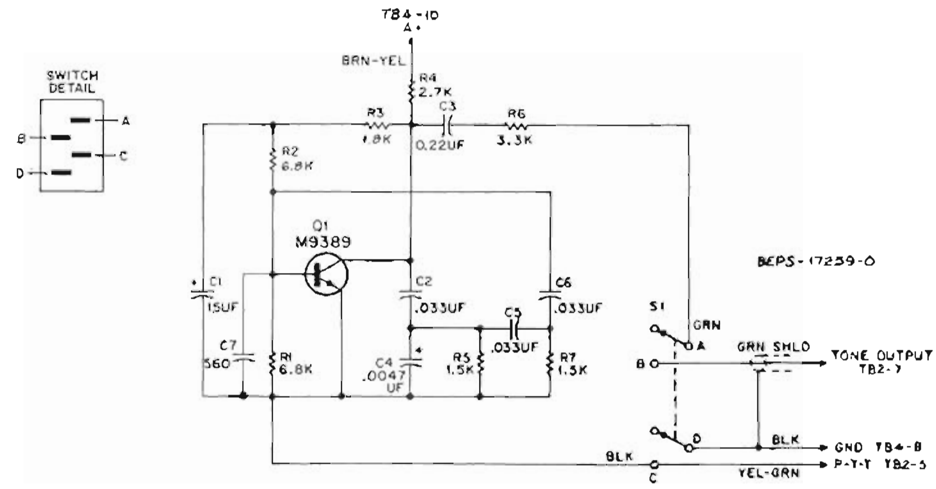
REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
K1	80-83812G01	**relay, covered:** 12 V dc; 6 form "C" contact; coiled resistance 130 ohms
R1	6-125C01	**resistor, fixed:** 10 ohms ± 10%; 1/2 W
		non-referenced items
	29-84706E02	TERMINAL, female, crimp socket; 2 used
	84-80193B01	BOARD, printed circuit (less components)

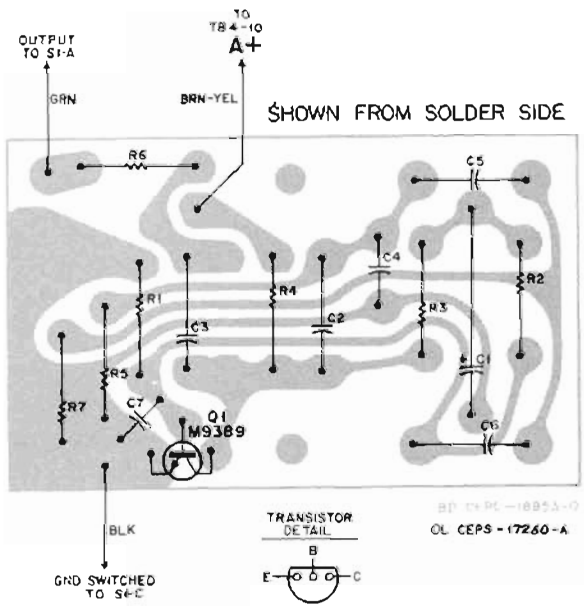
HLN4146A Miscellaenous Parts Kit — PL-6665-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
	3-134169	SCREW, tapping, 4-40 x 1/4"; 2 used
	3-136926	SCREW, tapping, 4-40 x 5/16"; 2 used
	7-84107C01	BRACKET, board mounting
	42-10217A02	STRAP, tie; 5 used

ALERT TONE OSCILLATOR

MODEL TLN1735A





DESCRIPTION

The alert tone oscillator provides a 1000 Hz tone that can be used as a signal prior to actual voice transmission or as a test tone when adjusting the deviation of a transmitter. The kit consists of a transistorized oscillator, a switch, the cabling required for circuit interconnections and the hardware for mounting to the front panel.

OPERATION

To transmit the alert tone, press and hold the ALERT TONE switch. The tone will be transmitted as long as the switch is held in. Release the switch to stop the tone.

PARTS LIST

TLN1735A Alert Tone Kit PL-3318-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		CAPACITOR, fixed:
C1	23D83214C02	15 uF ±20%; 25 V
C2	8D82905G08	.033 uF ±10%; 50 V
C3	8D82905G11	0.22 uF ±10%; 50 V
C4	21D82428B27	.0047 uF ±10%; 100 V
C5	8D82905G08	.033 uF ±10%; 50 V
C6	8D82905G08	.033 uF ±10%; 50 V
C7	21C82187B06	560 pF ±10%; 50 V
		TRANSISTOR: (SEE NOTE)
Q1	48R869389	N-P-N; type M9389
		RESISTOR, fixed: ±10%; 1/4 W:
R1, 2	6S128687	6.8k
R3	6S129269	1.8k
R4	5S128688	2.7k
R5	6S127803	1.5k
R6	6S129231	3.3k
R7	6S127803	1.5k
		SWITCH, lever:
S1	40C83303G03	dpst; 2-position; non-locking

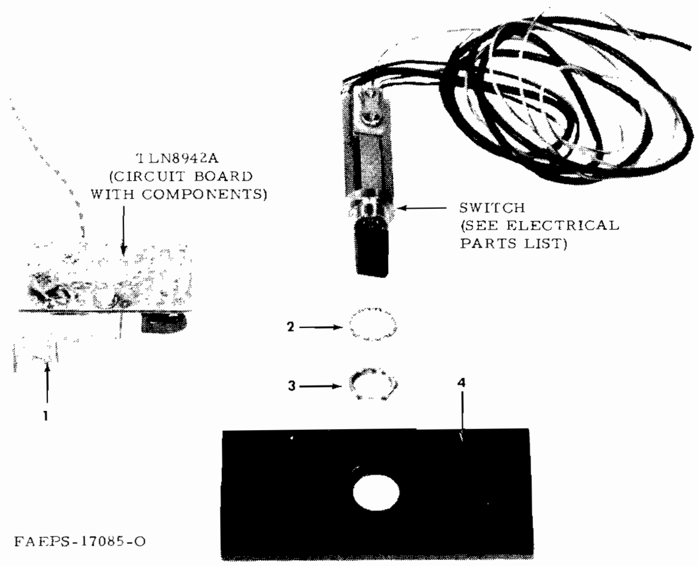
NOTE:

Replacement transistors must be ordered by Motorola part number only for optimum performance.

PARTS LIST

TLN1735A Alert Tone Kit
MECHANICAL PARTS PL-3319-O

CODE	MOTOROLA PART NO.	DESCRIPTION
1	7B84109C01	BRACKET, circuit board mounting
2	4S8424	LOCKWASHER; 15/32" internal type
3	2S115190	NUT, machine; 15/32-32 x 9/16" hex
4	64D83071G61	PANEL INSERT, switch mounting



FAEPS-17085-O

SINGLE-TONE ENCODER

MODELS TLN1736A AND TLN1736AV

DESCRIPTION

The multiple frequency single-tone encoder provides a selective tone for base-to-mobile selective calling, and provides remote switching functions for control of standby equipment.

Models with an "AV" suffix are the same as those with an "A" suffix except non-standard frequencies are used.

The oscillator may be used to tone-alert a receiving station to a pertinent incoming call, or the associated receiver station may incorporate a tone decoder unit, which will complete the audio output circuit. Thus, only the receiver(s) for which the call was intended will receive the message. Also a tone decoder equipped receiver can energize an external control circuit for repeater or alarm systems. The unit provides up to five tones which may be individually selected.

A six-position selector switch is used to select one of the tone frequencies or to turn "off" the tone transmission. The transistorized oscillator circuit is on a printed circuit board mounted inside the control console or base station.

ADJUSTMENT

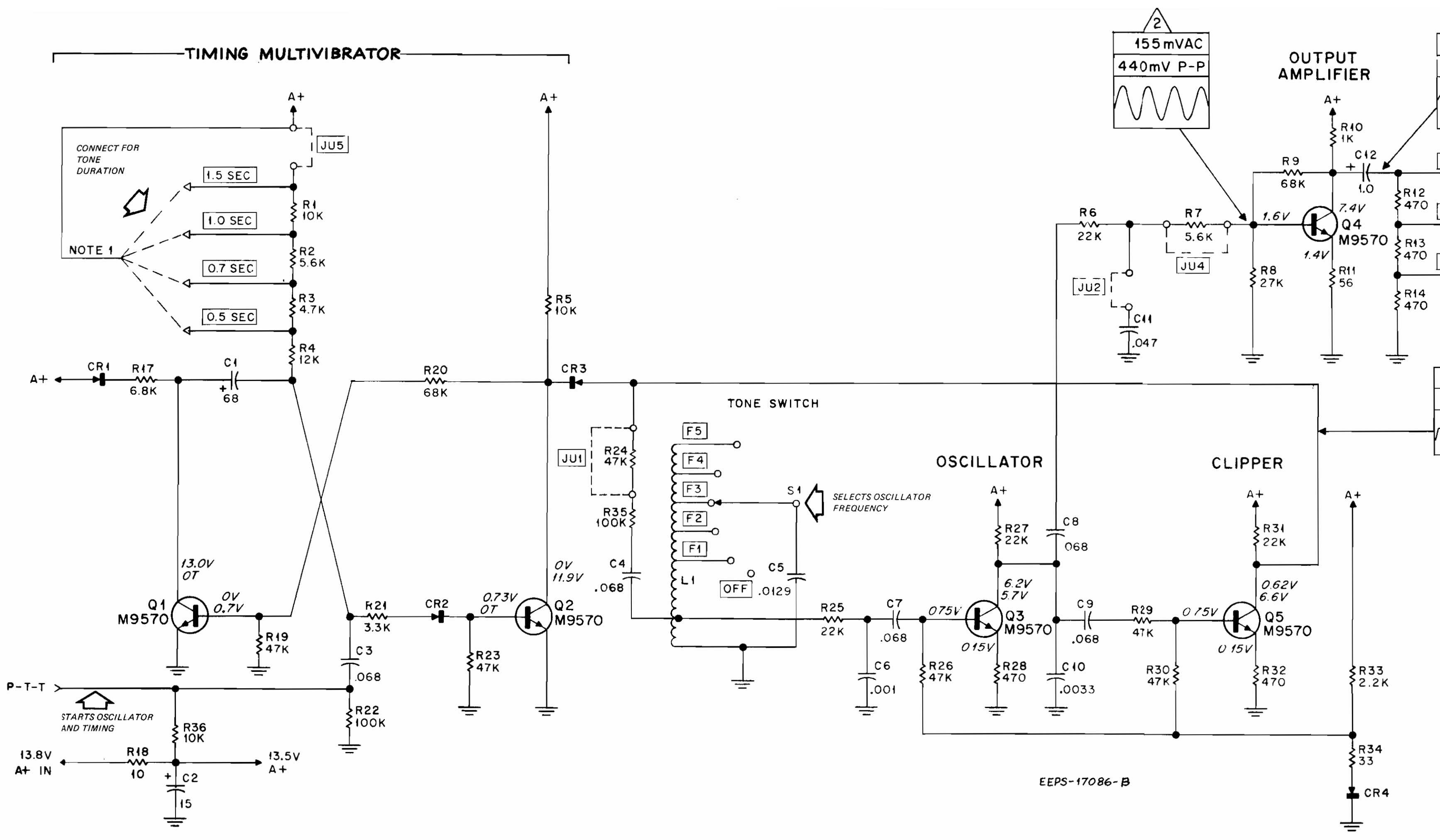
A level adjustment is usually unnecessary as the decoders in the receiving station operate over a wide range of deviation. However, if the oscillator fails to operate, check first to make sure all jumper options and external connections are properly made. Check to see that the unit is oscillating and then make the following tone level check:

With a clip lead jumper connected across resistor R23 (for continuous tone operation during adjustment) turn the radio set "on". The output control may then be set for proper deviation.

With deviation monitoring equipment, check the deviation caused by the tone modulation. This value should be approximately 50% of the maximum allowable deviation (maximum allowable deviation is ±5 kHz). If it is less than 30% or more than 90%, adjust the pin terminal jumper on the oscillator printed circuit board for the desired deviation.

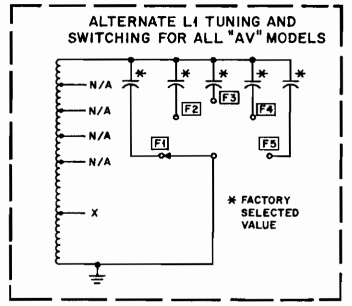
SERVICE

Complete removal of the circuit board for access to the components is not necessary. The board can be folded away from the chassis to expose the components. If it is necessary to disconnect leads from the circuit board, observe standard servicing procedures such as tagging leads and identifying connecting points. Refer to the photograph and to the circuit board detail for aid in lead identification.



NOTES:

1. JUMPER SELECTED OPTION. FACTORY SET FOR 1.5 SEC.
2. JUMPER SELECTED OPTION. FACTORY SET FOR MED. OUTPUT.



JUMPER CHART

JUMPER	STATUS	APPLICATION
JU-1	IN	LOCAL AND EXTENDED LOCAL CONTROL "COMPA-STATIONS." "MOTRAC" AND "MOCOM" "CONSOLETTE" BASE STATIONS.
JU-2	IN	
JU-3	OUT	
JU-4	IN	
JU-5	IN*	

* REPLACE WITH A RESISTOR WHEN TONE DURATIONS GREATER THAN 1.5 SECONDS ARE REQUIRED. MAXIMUM VALUE MUST NOT EXCEED 27k (3 SECONDS).

LEGEND

= THEORY OF OPERATION DATA

= MAINTENANCE DATA

PERFORMANCE SPECIFICATIONS

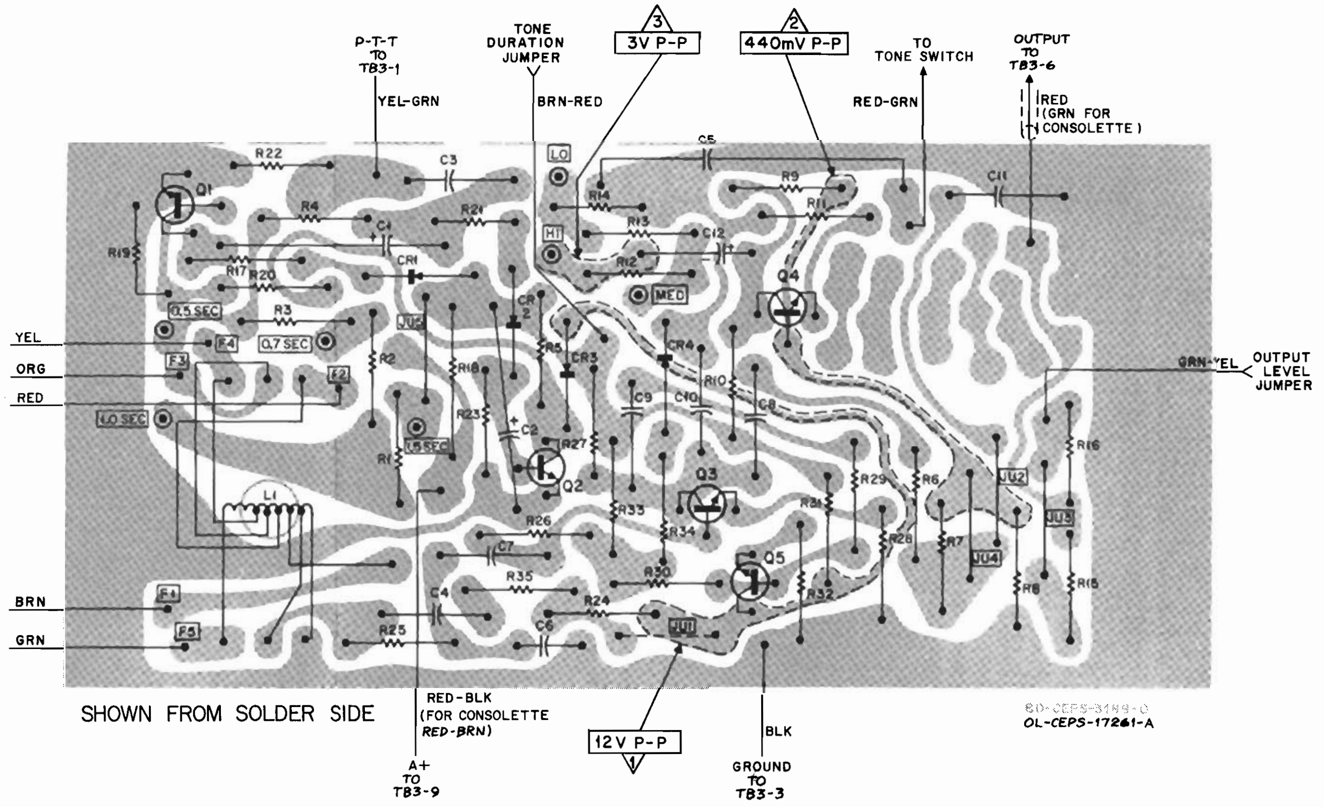
Tone Frequency Range	1350 Hz to 1950 Hz	
Power Input	+13.8 V dc	
Tone Duration	Approx. 0.5, 0.7, 1.0 and 1.5 seconds	
Output*	Pin Terminal Connection	Meter Indication
	High	Not more than 140 mV
	Medium	Not more than 40 mV
	Low	Not more than 20 mV

*Output specifications indicated for a transmitter input impedance of approximately 560 ohms.

Specifications subject to change without notice.

The standard tone frequencies in "A" suffix models are as follows:

F1 = 1950 Hz
F2 = 1800 Hz
F3 = 1650 Hz
F4 = 1500 Hz
F5 = 1350 Hz



SHOWN FROM SOLDER SIDE

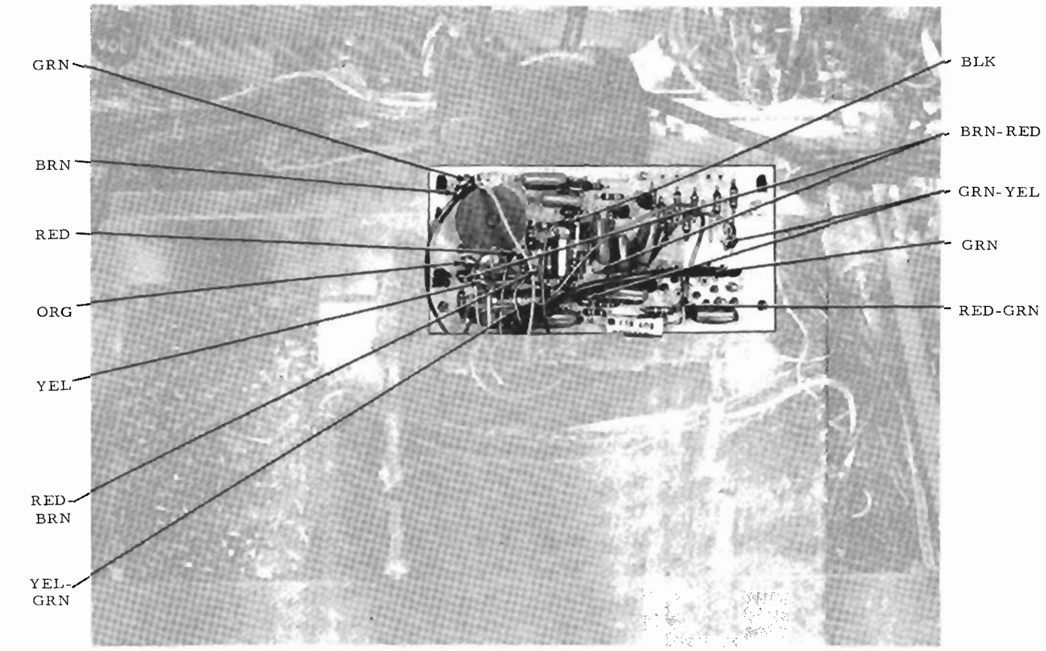
PARTS LIST

TLN1736A Single-Tone Encoder Board — PL-3322-A

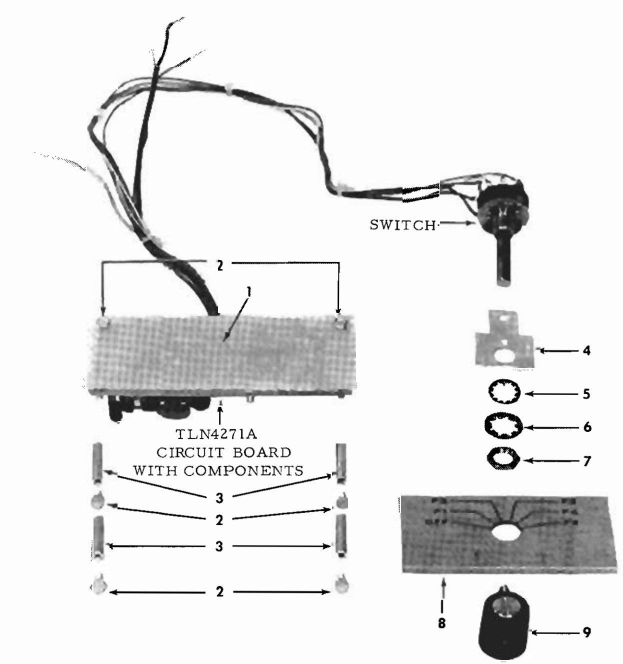
REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		CAPACITOR, fixed: uF ±10%; 50 V; unl. stated
C1	23K865594	68; 15 V
C2	23K865136	15 ±20%; 25 V
C3	8D82905G04	.068
C4	8D82905G04	.068
C5	8D84326A20	.0129
C6	21D82187B29	.001; 100 V
C7	8D82905G04	.068
C8	8D82905G04	.068
C9	8D82905G04	.068
C10	8D82905G25	.0033; 100 V
C11	8D82905G03	.047
C12	23D82783B08	1.0 ±20%; 35 V
		SEMICONDUCTOR DEVICE, diode:
CR1	48C82392B03	silicon
CR2	48C82392B03	silicon
CR3	48C82392B03	silicon
CR4	48C82392B03	silicon
		COIL, AF:
L1	24C84200A03	frequency determining; tapped
		TRANSISTOR:
Q1	48R869570	N-P-N; type M9570
Q2	48R869570	N-P-N; type M9570
Q3	48R869570	N-P-N; type M9570
Q4	48R869570	N-P-N; type M9570
Q5	48R869570	N-P-N; type M9570
		RESISTOR, fixed: ±10%; 1/4 W; unl. stated
R1	6S129668	10k ±5%
R2	6S129982	5.6k ±5%
R3	6S129669	4.7k ±5%
R4	6S129887	12k ±5%
R5	6S129225	10k
R6	6S128685	22k
R7	6S129433	5.6k
R8	6S127806	27k
R9	6S129144	68k
R10	6S127802	1k
R11	6S128860	56
R12	6S127801	470
R13	6S127801	470
R14	6S127801	470
R15	6S127801	470
R16	6S129226	100k
R17	6S128687	6.8k
R18	6S5621	10; 1/2 W
R19	6S128902	47k
R20	6S129144	68k
R21	6S129231	3.3k
R22	6S129226	100k
R23	6S128902	47k
R24	6S128902	47k
R25	6S128685	22k
R26	6S128902	47k
R27	6S128685	22k
R28	6S127801	470
R29	6S128902	47k
R30	6S128902	47k
R31	6S128685	22k
R32	6S127801	470
R33	6S128689	2.2k
R34	6S129754	33
R35	6S129226	100k
R36	6-124C73	10k
		SWITCH:
S1	40C84354B01	rotary
	NON-REFERENCED ITEM	
	TLN4271A	CIRCUIT BOARD ASSY (includes electrical components)

TLN1736A Single-Tone Multi-Frequency Kit
MECHANICAL PARTS — PL-3323-B

CODE	MOTOROLA PART NO.	DESCRIPTION
1	14B84263C01	INSULATOR, circuit board
2	3-134184	SCREW, tapping; 4-40 x 5/16" w/internal lockwasher; 6 used
3	43A84115C03	STUD, circuit board mounting
4	7B83728G01	BRACKET, switch mounting
5		WASHER, switch stop setting (supplied with switch)
6		LOCKWASHER (supplied with switch)
7		NUT, mounting (supplied with switch)
8	64D83071G53	ESCUTCHEON
9	36C82869K01	KNOB, control; includes Item 10
10	3S7104	SETSCREW; 8-32 x 5/16" headless; slotted drive (supplied with Item 9)
	NON-REFERENCED ITEM	
	37C82603D60	SLEEVE, heat-shrinkable; 10 required



AEPS-4276-O



AEPS-5396-O

"CHANNEL-SCAN" MONITOR

MODEL HLN1048A

1. DESCRIPTION

This "Channel-Scan" monitor is an optional accessory for local-control, multi-frequency "Mitrek" Super Consolette base stations. It allows the operator to automatically monitor up to four channels with a single receiver. The unit provides sequential scanning of the receiver's frequencies, activating each receiver channel element in turn.

When a signal is received on any channel, the unit stops scanning and the message is heard. However, if it stops on a non-priority channel, the unit continues to sample the priority channel at a rate which does not disturb the intelligibility. When a signal is received on the priority channel, the receiver switches to the priority channel and all scanning stops until priority is inactive. This assures that the operator can monitor any of the channels which the radio is capable of receiving without missing any messages on the priority channel.

2. OPERATING INSTRUCTIONS

On stations equipped with "Channel-Scan" monitor, the frequency selector switch is a dual concentric control device. The front control selects the receiver priority channel — F1, F2, F3 or F4. The rear control selects the transmitter frequency — F1, F2, F3, or F4. All channels are monitored when the SCAN ON-SCAN OFF switch is in the SCAN ON position, and the four LED indicators on the front panel provide a visual indication of which channel is received.

Select the channel which is to have priority with the front F1-F2-F3-F4 control. Set the SQUELCH control at threshold for most sensitive operation. Since the audio is muted while scanning, disable scan operation while adjusting squelch as follows:

- SCAN ON-SCAN OFF switch to SCAN OFF.
- "PL" ON-OFF to OFF on PL stations.
- SQUELCH control counterclockwise until noise is heard.
- Adjust VOLUME as desired.
- Turn SQUELCH control clockwise slowly to a point where noise just quiets.
- Turn SCAN ON-SCAN OFF switch to SCAN ON and PL switch ON to return to scan operation.

When a signal is received, readjust the VOLUME control as desired. If a signal is received on a channel, the LED indicator for that channel will light. A signal on the priority channel will never be missed, the unit automatically reverts to the priority channel when a signal is present, and the indicator for the priority channel will light.

To monitor only one channel, place the SCAN ON-SCAN OFF switch in the SCAN OFF position and select the desired receive frequency with the rear F1-F2-F3-F4 control. In the SCAN OFF position the indicators will be off.

On **Private-Line** stations equipped with this "Channel-Scan" monitor, the operation is the same as described previously except that the signal will be heard only if it is coded with the proper PL tone, or the PL switch is OFF.

3. FUNCTIONAL OPERATION

3.1 GENERAL

Once priority status is determined, as described previously, the channels are scanned in sequence until a carrier is received. The unit will then stop scanning and lock onto that channel if it is a priority channel. If it is a non-priority channel, it will lock onto that channel but will continue to sample the priority channel four times a second to ensure the complete reception of all priority channel messages. If a non-priority signal was being received when a priority signal arrived, the unit will revert to that same non-priority channel, if it is still active, when the priority signal disappears. Normal sequential scanning resumes when no signals are present.

When a channel is "scanned" or "sampled", a ground is applied to its particular receiver channel element from the scan unit. This enables the channel element which, in effect, turns that receiver channel on. If there is no signal on that channel, the scan unit then ungrounds the channel element, inhibiting that channel, and sequentially, enables the next channel searching for an on-channel signal.

The following discussion describes circuit operation during no signal input conditions and received signal input conditions. Refer to the schematic diagram at the end of this manual while the reading the following discussion.

3.2 NO ON-CHANNEL SIGNAL CONDITION

3.2.1 Squelch IC1

The "Channel-Scan" monitor unit receives its input from the arm of the SQUELCH control in the associated control module. This allows the noise input level to be adjusted to the desired threshold level.

While there is no on-channel signal, the input noise level to squelch IC1-15 is high which causes its output at pin 10 to be a logic "high" (5 V dc). Figure 1 shows the relationship of input noise at J1-1 (upper trace) to IC1-10 output (lower trace).

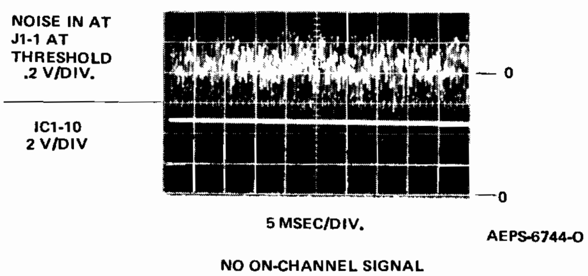


Figure 1.

3.2.2 1st Current Amplifier, Gate, Gate Driver, Gate, and High-Speed Clock Multivibrator

While IC1-10 is "high" first current amplifier Q1 is conducting, gate Q3 is cut off, gate driver Q4 and gate Q5 are conducting. This provides an emitter ground to Q6 through Q5 which enables the high-speed clock multivibrator Q6 and Q7. This multivibrator runs with a period of approximately 20-22 milliseconds (a pulse lasts approximately 10-11 milliseconds). These pulses are routed to non-priority binary counter IC2.

3.2.3 Non-Priority Binary Counter IC2

Refer to Figure 2. Integrated circuit IC2 is a dual flip-flop binary counter with one input and four outputs. As connected, four unique output states occur, in sequence, as pulses are applied to pin 1 from the high-speed clock multivibrator.

IC2 input relationships are shown in Figures 3 and 4. The top waveform of Figure 3 shows input pulses arriving at pin 1. The bottom waveform shows resulting output pulses at pin 15. The top waveform of Figure 4 shows input pulses to pin 6 while the bottom waveform shows output pulses at pin 11.

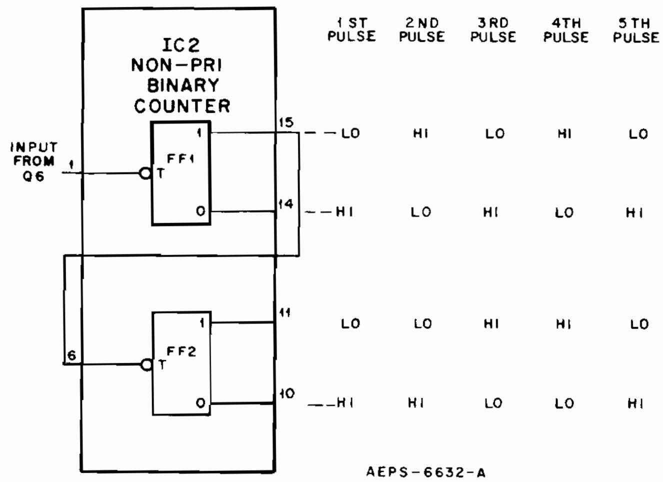


Figure 2.

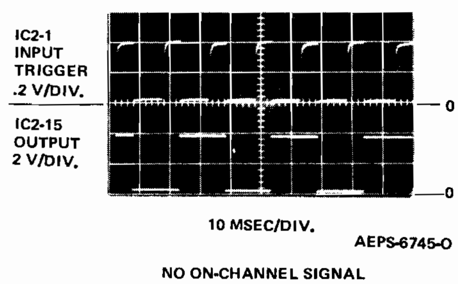


Figure 3.

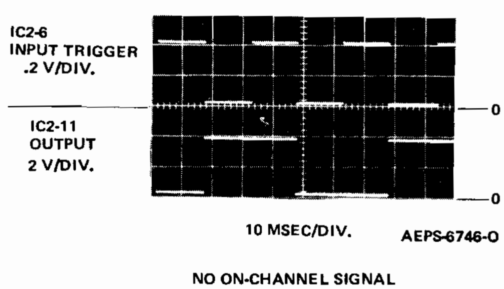


Figure 4.

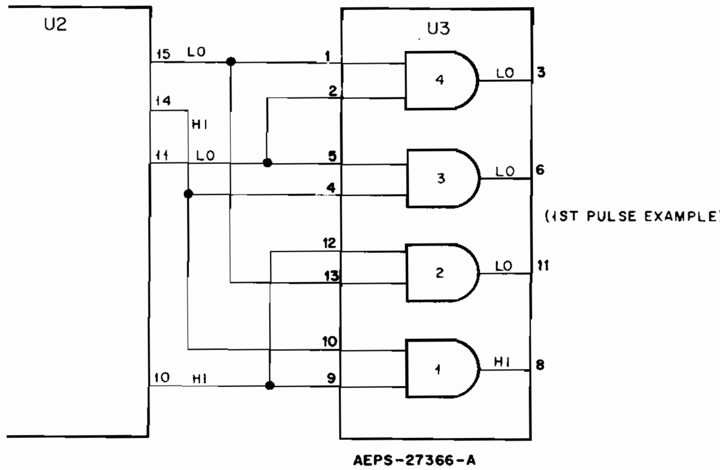


Figure 5.

3.2.4 Non-Priority Decoder IC3

The output of non-priority binary counter IC2 is connected to non-priority decoder IC3. This IC consists basically of four AND gates which convert IC2 output combinations into channel 1, 2, 3, or 4 intelligence. Refer to Figure 5.

Each AND gate requires a logic "high" on both input leads to produce a logic "high" (approximately 5 volts) output. As connected to non-priority binary counter IC2, only one AND gate can receive both logic "highs" at any one time. Therefore, one AND gate has a logic "high" output while the remaining three AND gates have logic "low" (approximately 0 volts) outputs. The logic output states shown in Figure 5 illustrate a first received pulse condition. As shown in Figure 2, a second pulse causes IC2-15 and -10 only to go high. IC3 AND gate 2 is connected to IC2-15 and -10 and therefore is the only AND gate with a "high" output due to the reception of the second pulse.

3.2.5 LED and Non-Priority Channel Element Driver IC4

The output of non-priority decoder IC3 is applied to the LED and non-priority channel element driver IC4. This IC consists basically of four dual input NAND gates — two input "highs" are required to produce a "low" output. Each NAND gate is connected to one output from decoder IC3 *and* to non-priority inhibit switch Q22. Refer to Figure 6.

While there is no on-channel message, a logic "high" appears on IC4-1, -4, -10, and -12 from non-priority inhibit switch Q22. When a logic "high" arrives from decoder IC3, the associated IC4 NAND gate provides a logic "low" output.

A logic "low" from one of the four IC4 output terminals: (1) activates the associated receiver channel element by grounding it, and turns on the associated channel indicator LED driver. The indicators will remain off during scanning. For example, a logic "low" at IC4-6 is routed via jumper JU1 to the F1 receiver channel element in the radio set. The "low" is also routed through diode CR3 to LED driver inhibit switch Q8 which grounds the emitter. Q8 will remain off, however, until bias drive is supplied from the collector of 1st current amplifier Q1 which occurs during on-channel message conditions. When Q8 conducts, bias drive is supplied to LED driver Q12 and it conducts turning on the F1 indicator. Pins 3, 8, and 11 of IC4 are used with F2, F3 and F4 receiver channel elements, and Q9, Q10, and Q11 lamp driver inhibit switches respectively.

The top waveform in Figure 7 shows the output pulses that occur on the collector of Q7 while no signal is being received. The bottom waveform shows a non-priority channel element being "activated" during no signal input conditions and can be found at any IC4 output pin.

3.3 ON-CHANNEL SIGNAL CONDITION

3.3.1 Squelch IC1

When an on-channel message is received, receiver noise output is reduced. When the received signal strength is above the reference level established by setting of the control module SQUELCH control, the output from IC1-10 is at a logic "low". The upper trace of Figure 8 was taken at J1-1. It illustrates receiver quieting due to the reception of an on-channel signal. The lower trace shows IC1 output at pin 10 dropping to a logic "low" (0 volts), when the signal is received.

3.3.2 Squelch Timing Circuit

Pin 12 of IC1 is connected to a circuit within the squelch integrated circuit which has the ability to

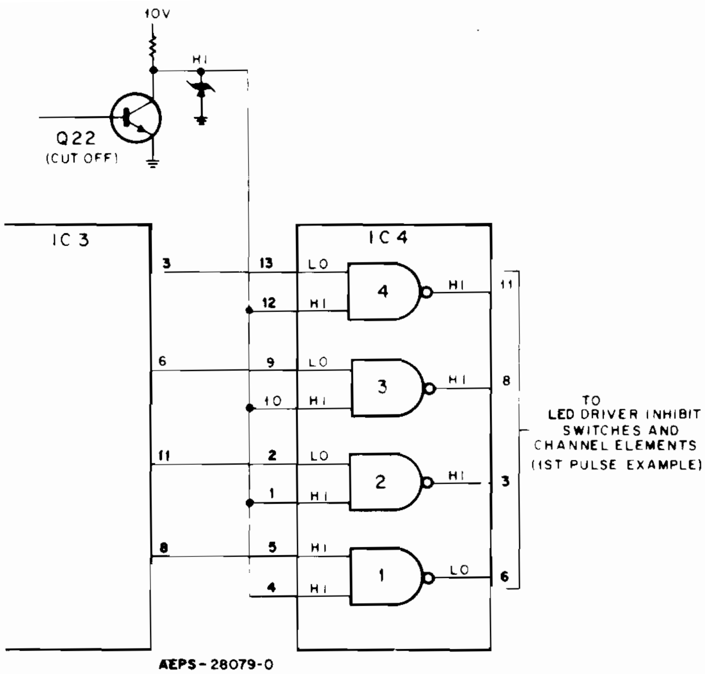


Figure 6.

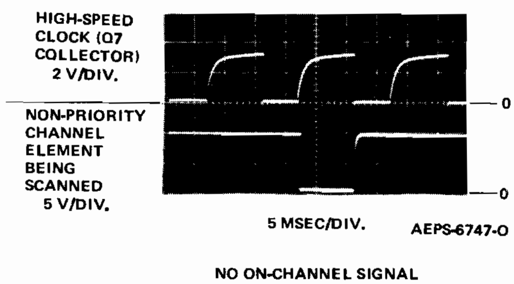


Figure 7.

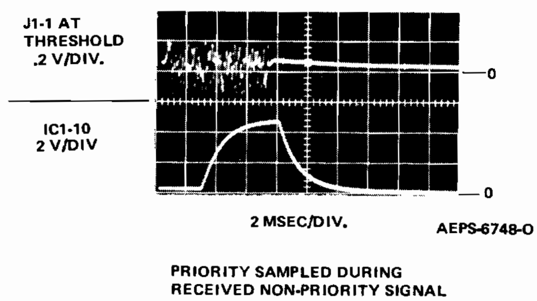


Figure 8.

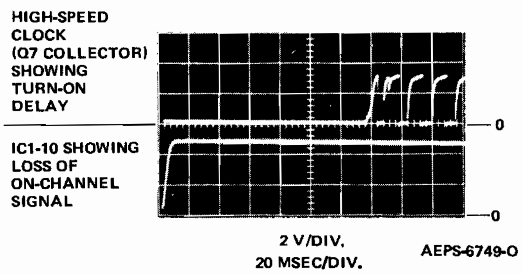
distinguish between weak and strong signals. When a weak signal is detected (a signal less than 20 dB quieting) the voltage on pin 12 rises to about 5.0 volts, charging C35. This charge on C35 causes a long squelch drop-out or "squelch tail" to prevent loss of signal on fades.

This long squelch response on weak signals cannot, however, be tolerated when sampling priority in the presence of a weak non-priority signal. The long response time would cause an unacceptably large "hole" to be cut in the non-priority message. It is for this reason that transistor Q36 and its associated circuitry is provided to rapidly discharge C35 when sampling priority.

When the priority sampling monostable begins its cycle, the collector of Q27 goes positive. A positive pulse is coupled from this collector through isolation diode CR23, capacitor C34, and resistor R90 to the base of Q36. Q36 turns on,shorting capacitor C35 to ground, rapidly discharging it. The time constant of C34-R90 is set so that the grounding is applied for approximately 3 milliseconds. This allows time for the squelch to respond to the new channel being looked at, but is short enough to allow activation of the long squelch tail feature if a weak signal is detected on priority. Resistor R89 allows capacitor C34 to discharge between samples.

3.3.3 1st Current Amplifier, Gate, Gate Driver, Gate, and High-Speed Clock Multivibrator

While IC1-10 is "low", first current amplifier Q1 is cut off, gate Q3 is conducting, gate driver Q4 and gate Q5 are cut off. This disables the high-speed clock multivibrator Q6 and Q7 by removing the emitter ground to Q6. While the high-speed clock multivibrator is inhibited, binary counter IC2 stays in the state created by the last input pulse and further non-priority channel scanning is prohibited. The message will be heard if the associated channel select pushbutton switch is closed. With the priority model, the message will be heard unless there is a message on another channel which has priority. A delay network is used to prevent the resumption of non-priority channel scanning should a received signal be lost or "fade" for less than approximately 150 milliseconds. When a received signal is lost, gate Q3 stops conducting immediately and capacitor C14 begins to charge. After approximately 150 milliseconds, C14 is charged sufficiently to forward bias Q4 and Q5, the high-speed clock multivibrator is enabled, and scanning resumes. This is illustrated in Figure 9. The bottom waveform shows the output at IC1-10 going from a logic "low" (low noise — on-channel signal received) to a logic "high" (loss of signal). The top waveform taken at Q7 collector shows by comparison that scanning resumes approximately 150 milliseconds after the loss of the signal.



ON-CHANNEL SIGNAL LOST

Figure 9.

3.3.4 Slow-Speed Clock Inhibit Switch

This switch (Q16) inhibits the output of the slow-speed clock multivibrator (Q23 and Q24) at the base of inverter Q25 while no on-channel message is being received. The base of Q16 is connected to the collector of gate Q3. While no on-channel message is being received, Q3 is cut off and Q16 is conducting, grounding the output of Q24. When an on-channel signal *is* received, Q16 cuts off and slow-speed clock pulses are passed to inverter Q25.

3.3.5 Slow-Speed Clock Multivibrator and Inverter

The slow-speed clock multivibrator (Q23 and Q24) generates pulses at the rate of 4 per second. These pulses are used to cause priority channel sampling while a message is being received on a non-priority channel. Output pulses, if not grounded by the slow-speed clock inhibit switch Q16, are inverted by Q25 and passed to the priority sampling monostable Q26 and Q27.

3.3.6 Priority Sampling Monostable

The priority sampling monostable converts the positive pulses from Q25 into 6-7 millisecond duration positive pulses.

The monostable consists of transistors Q26 and Q27 with associated circuitry. Q26 conducts for the duration of a positive pulse from Q25. Capacitor C24 and resistor R68 form a voltage decay delay network that causes Q27 to conduct for approximately 6-7 milliseconds after Q26 is cut off. When Q27 conducts, its collector voltage is "high". Since a triggering pulse arrives at the input to the monostable at the rate of 4 times a second, a "high" is present on the collector of Q27 for 6-7 milliseconds every 250 milliseconds (during non-priority message reception conditions). This "high" output is routed to four places — (1) non-priority inhibit switch Q22, (2) priority sampling mute switch Q30, (3) priority channel element drivers Q28 and Q29 and (4) priority detect gate Q21.

3.3.7 Non-Priority Inhibit Switch

Non-priority inhibit switch Q22 disables the non-priority channel while the priority channel is being sampled, or when a priority signal is being received. This prevents the possibility of two channel elements being on at the same time which would cause spurious oscillations.

When the priority channel is sampled, Q27 conducts and applies a "high" to the base of Q22 through resistor R58. This causes Q22 to conduct which grounds one input terminal of each NAND gate in IC4. Since an output "low" is required from a NAND gate to enable its associated non-priority channel and two input "highs" to the NAND gate are required to get a "low", grounding one input terminal inhibits non-priority channel element grounding.

3.3.8 Priority Sampling Mute Switch

Priority sampling mute switch Q30 prevents a "blip" of noise from being heard each time the priority channel is sampled.

Q27 drives Q30 through diodes CR16 and CR17 and resistor R73. When the collector of Q27 goes "high", Q30 conducts and mutes receiver audio. Capacitor C25 "softens" the muticg to minimize objectionable "popping" during priority sampling. C25 provides approximately 7 milliseconds of delay to Q30 turn off.

3.3.9 Priority Channel Element Drivers

Priority channel element drivers Q28 and Q29 provide a switched ground to enable the priority channel element. This occurs when the priority channel is "scanned" (a "high" on the collector of Q27) or when a message is received on the priority channel (a "high" on the collector of priority detect gate Q21).

3.3.10 Priority Detect Gate

Priority detect gate Q21 is a NAND gate "looking" at squelch IC1 output and scanning status. When on-channel signal reception (IC1-10 "low") and priority sampling happen simultaneously, this circuit causes all scanning to stop and the receiver is locked onto the priority signal.

On-channel signals cause squelch IC1-10 to go "low". First current amplifier Q1 is cut off and second current amplifier Q2 is conducting. This applies a "low" through diode CR11 to the base of priority detect gate Q21. The second input to Q21 is via non-priority inhibit switch Q22 which has a "low" output while the priority channel is being sampled. The third input to Q21 is from off-transmit revert switch Q19 which is cut off unless the "Channel-Scan" monitor unit is off or the radio set is keyed. When Q2, Q22, and Q19 outputs are "low", Q21 is cut off and a "high" is routed through resistor R55 to priority channel element drivers Q28 and Q29 which turns them on. The priority sampling monostable turns the priority channel element drivers on to sample the priority channel. The priority detect gate *holds* the priority channel element drivers on once a priority signal is detected, until that signal disappears. During an on-channel non-priority condition, capacitor C32 delays the "high" output of Q2 by about 3 milliseconds. This will have no effect on the priority detect gate turn-on time.

A "high" output from Q21 also biases on slow-speed clock inhibit switch Q16 to inhibit further slow-speed pulses at the base of Q25; and turns on non-priority inhibit switch Q22 via resistor R57 to inhibit non-priority channel element grounding.

3.3.11 Priority Clock Inverter

While there are no on-channel signals, the high-speed clock multivibrator is running and non-priority channels are sampled. Priority clock inverter Q17 causes the priority channel to be sampled after a non-priority channel has been sampled. For example, the sampling sequence of a four-frequency radio with F3 priority is F1, F3, F2, F3, F3, F3, F4, F3, F1, F3, etc.

The high-speed clock multivibrator drives binary counter IC2 via the priority sampling monostable Q26 and Q27 through priority clock inverter Q17. When the collector of Q7 goes "low", Q17 is cut off. This causes capacitor C23 to charge positively through bias resistor R67 and forward biases Q26. When the collector of Q7 goes "high", Q17 conducts and Q26 is cut off. Non-priority inhibit switch Q22 is activated by Q27 when priority is sampled during the high *or* slow speed modes. This inhibits the non-priority channel to prevent the possibility of two channel elements being on at the same time.

3.3.12 Noise Oscillator and Delay Gate

The noise oscillator (Q32 and Q33) keeps the receiver fully squelched to prevent a "buzzing" sound from being heard from the speaker while there is no on-channel signal. This is accomplished by generating artificial noise during the high speed scan rate, because the noise level is not sufficient to keep the receiver fully squelched. Whether the SCAN is on or off, the squelch input is routed to the "Channel-Scan" monitor circuits and the noise oscillator provides the squelch output to the radio. The delay gate (Q31) prevents the noise oscillator from squelching the radio set when the priority channel is sampled while a non-priority channel message is being received. Otherwise, a partial loss of non-priority message would result.

When an on-channel signal disappears, second current amplifier Q2 is cut off, charging C32, and its collector goes "high" after 3 milliseconds. After approximately 30 to 35 milliseconds, capacitor C27 is charged sufficiently to forward bias delay gate Q31 which provides emitter grounds to Q32 and Q33 and the oscillator is enabled.

Figure 10 shows the noise oscillator output waveform present at J1-3 when no on-channel signal is being received. A low from squelch inhibit switch Q18 enables the oscillator during transmit to prevent a noise burst from being heard in the speaker upon de-keying.

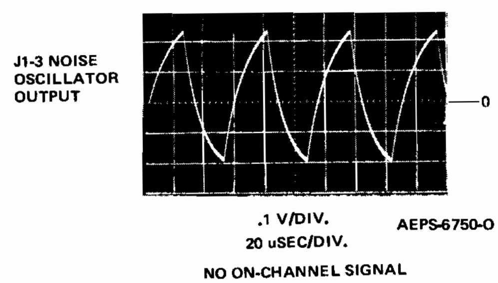


Figure 10.

Figure 11 illustrates noise oscillator turn-on delay. The bottom waveform shows squelch IC1-10 going from a logic "low" to a logic "high" when an on-channel signal is lost. Approximately 35 milliseconds later, the noise oscillator starts to oscillate as is shown in the top waveform, taken at J1-3.

3.3.13 Off-Transmit Revert Switch

This switch inhibits non-priority and priority element grounding, disables squelch during transmit, and causes transmitter channel element to be grounded when a PTT function is applied. When the SCAN switch is off, this switch performs these functions continuously.

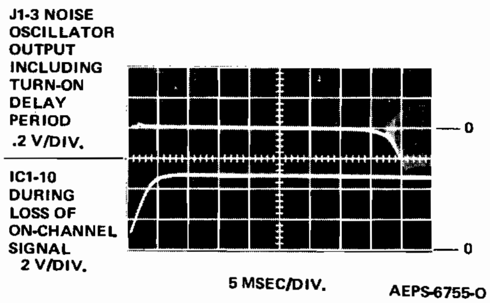


Figure 11.

When a ground is applied via the microphone PTT switch, Q37 conducts which causes Q19 to conduct. This causes squelch inhibit switch Q18 to conduct and grounds the output of squelch IC1. This keeps the high-speed clock from running, and insures that the appropriate LED will light by applying bias through resistors R24-R27.

Transmitter channel element driver Q20 turns on, which routes a ground through jumper JU9 to the selected transmitter channel element. However, the transmitter channel element is not enabled until A+ is applied to it as well as the ground which is routed from the "Channel-Scan" monitor unit. When the scan is turned off, Q18 is inhibited by the low through CR10 to allow the squelch to continue to operate. The high speed clock is inhibited through CR19.

Non-priority elements are inhibited when Q19 goes "high" through diode CR12 and resistor R56. The priority element is inhibited through diode VR2 and resistor R49.

When transmitting or when "off", slow-speed pulses must be inhibited to prevent priority channel element grounding. This is accomplished when Q19 goes "high" through resistor R43 to slow-speed inhibit switch Q16.

4. MAINTENANCE

4.1 MAINTENANCE AND ADJUSTMENT PROCEDURES

Maintenance information for the "Channel Scan" monitor is provided on the schematic diagram, wiring diagram and the block diagram (Figure 12). Adjustment and troubleshooting procedures are given in the following paragraphs. The circuit board can be accessed for maintenance by removing the station cabinet housing and the transmitter-receiver unit. Once this is accomplished, the solder side of the "channel scan" monitor circuit board is accessible for convenient servicing.

To reach the component side, either remove the four screws securing the board to the stand-off posts or turn the station chassis on the side and remove the four screws securing the stand-off posts to the chassis.

CAUTION

If the board is removed from the stand-offs, be sure to re-install the insulating washers before re-mounting the board.

4.1.1 Voltage Regulator Output

Step 1. Measure the voltage from emitter of Q34 to ground with the dc voltmeter. It should be 10 V dc, ±6%.

Step 2. Measure the voltage across capacitor C31 with the dc voltmeter. It should be 5 V dc, ±6%.

4.1.2 High-Speed Clock Multivibrator Frequency

Step 1. With the scan "on" and no rf signal in, set the SQUELCH control so that noise just cuts out (squelches) so that scanning is initiated.

Step 2. With the oscilloscope, observe the waveform on the collector of Q7. Its frequency should be 33 Hz, ±10% as shown on waveform 18 , top trace.

Step 3. Turn the SQUELCH control until nosie is heard from the speaker. Scanning should stop.

4.1.3 Slow-Speed Clock Multivibrator Frequency and Non-Priority Lock-On

Step 1. Set channel priority switch (front control) to F4.

Step 2. Turn the SQUELCH control until noise from the speaker just cuts out.

Step 3. Set the rf signal generator to the radio set F1 frequency @100 microvolts. The unit should lock onto F1 (F1 LED indicator illuminates) and observe the F4 LED indicator blinking (sampling F4 priority channel). Audio is not heard during this test because the rf input signal is not modulated, although it could be.

Step 4. Observe the waveform on the collector of Q24 with an oscilloscope. The frequency should be 4 Hz, ±20% as shown on waveform 11 , top trace.

Step 5. Adjust the signal generator output to the F2 frequency, then F3 frequency @100 microvolts. The unit should lock onto F2, then F3, respectively.

Step 6. Set the channel priority switch to F1.

Step 7. Set the rf signal generator to the radio set F4 frequency @1000 microvolts. The unit should lock onto

F4 (F4 LED indicator illuminates) and observe the F1 LED indicator blinking (sampling F1 priority channel).

4.1.4 Sampling Time

Step 1. With test equipment set up as in Step 5 of the previous paragraph, observe the waveform at the collector of Q29 with an oscilloscope. The channel element sampling period (0 volts) should be greater than 10 milliseconds (see waveform 11).

Step 2. Disconnect the signal generator. The sampling period at the collector of Q29 (0 volts) should still be greater than 10 milliseconds (see waveform 1).

4.1.5 Priority Lock-On

Step 1. Set channel priority switch to F4.

Step 2. Connect the signal generator and adjust it to the radio set F4 frequency @100 microvolts. The unit should lock on F4 and the F4 LED indicator should light. Repeat this step with F1, F2, and F3 selected as priority.

4.1.6 Noise Oscillator Frequency

Step 1. With the rf signal generator disconnected, turn the SQUELCH control until noise from the speaker is just cut out.

Step 2. Observe the waveform at the collector of Q33. The frequency should be 15 kHz, ±3.2 kHz (see waveform 13).

Step 3. Turn the SQUELCH control until noise is heard from the speaker. The noise oscillator should stop.

4.1.7 Revert

Step 1. Turn the SCAN ON-SCAN OFF switch to SCAN OFF.

Step 2. Set the rear frequency selector switch to the F1 position.

Step 3. Tune the signal generator to F1 @1000 microvolts and apply modulation. This signal should be heard on the speaker.

Step 4. Repeat Step 2 and Step 3 for F2, F3, and F4.

4.2 TROUBLESHOOTING INTEGRATED CIRCUITS

Integrated circuits (IC's) are very reliable components and should not be replaced until all checks have proven definitely that the IC is the defective component. Removal of an IC is time consuming and often ruins the part. Therefore, a few extra checks before that task is attempted are worthwhile. Before replacing a bad IC, make sure that the external components in the circuit are normal.

The IC's in the "Channel-Scan" monitor may be checked by dc voltage measurements although signal tracing with an oscilloscope is preferred. Typical dc voltages are shown on the schematic diagram. Waveforms are shown on the waveforms diagram.

If an IC is to be replaced, heat each IC terminal and remove all solder with a "solder sucker" vacuum bulb or use a special IC removing tool.

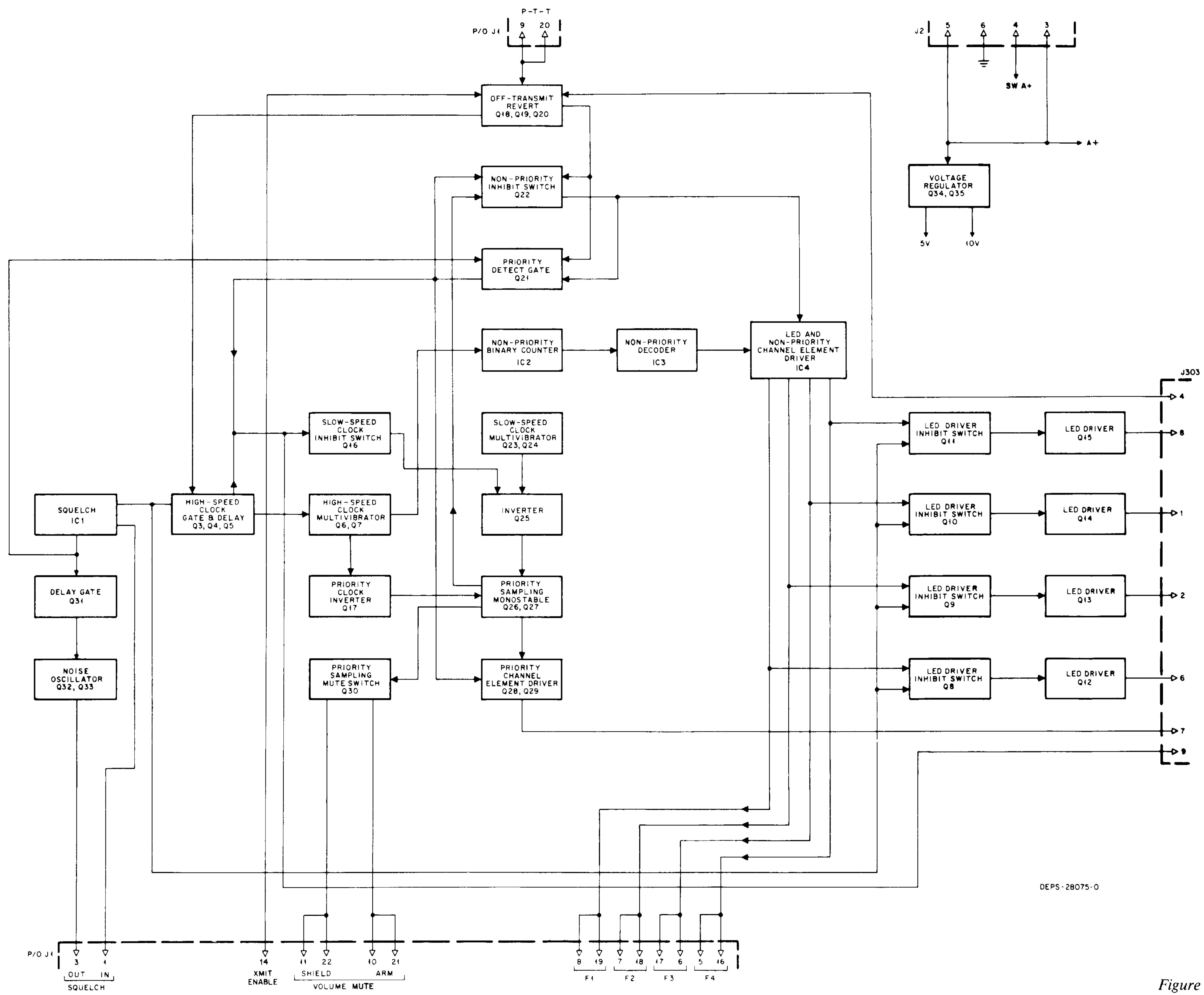


Figure 12. Channel Scan Monitor Block Diagram

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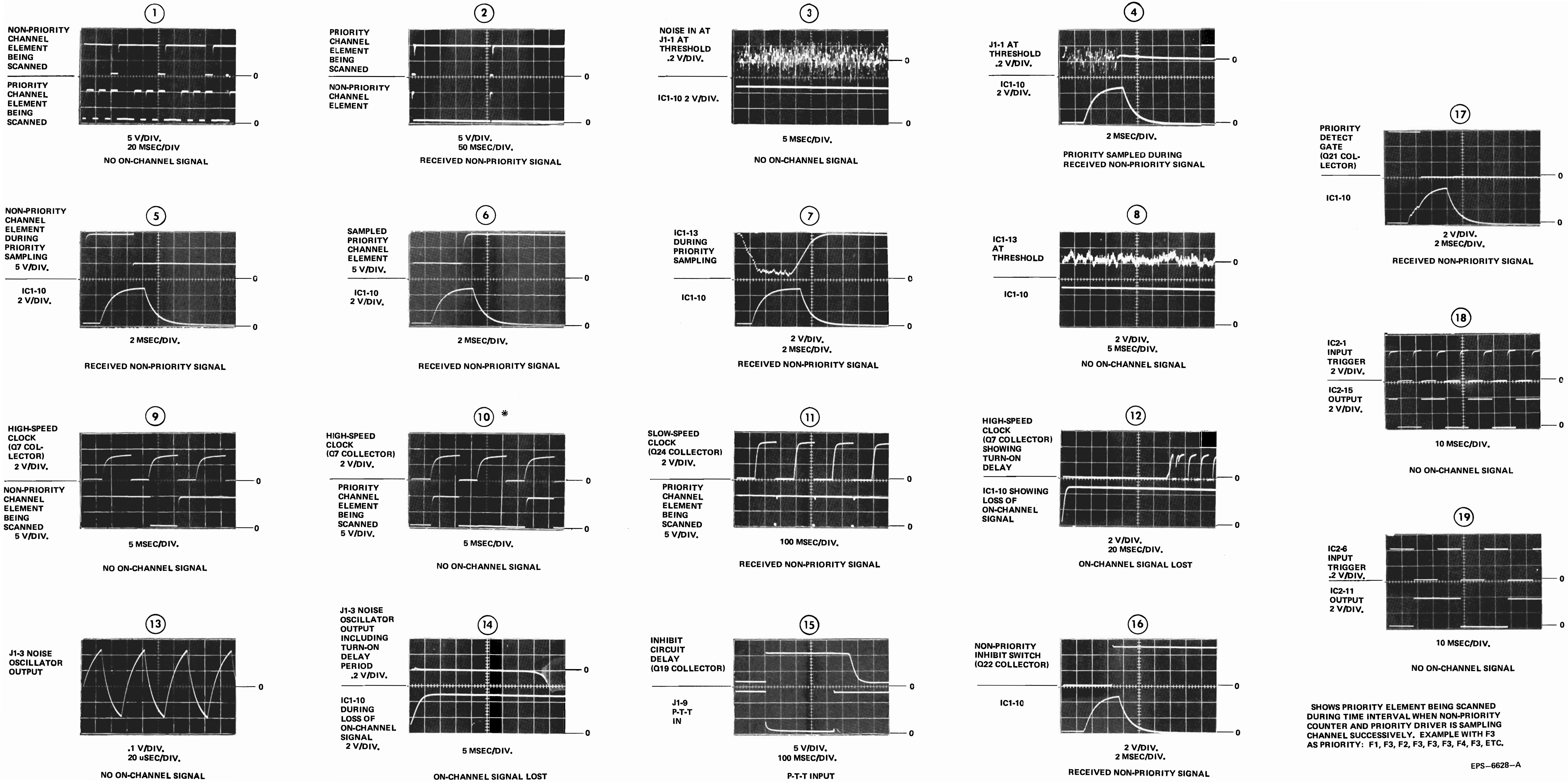
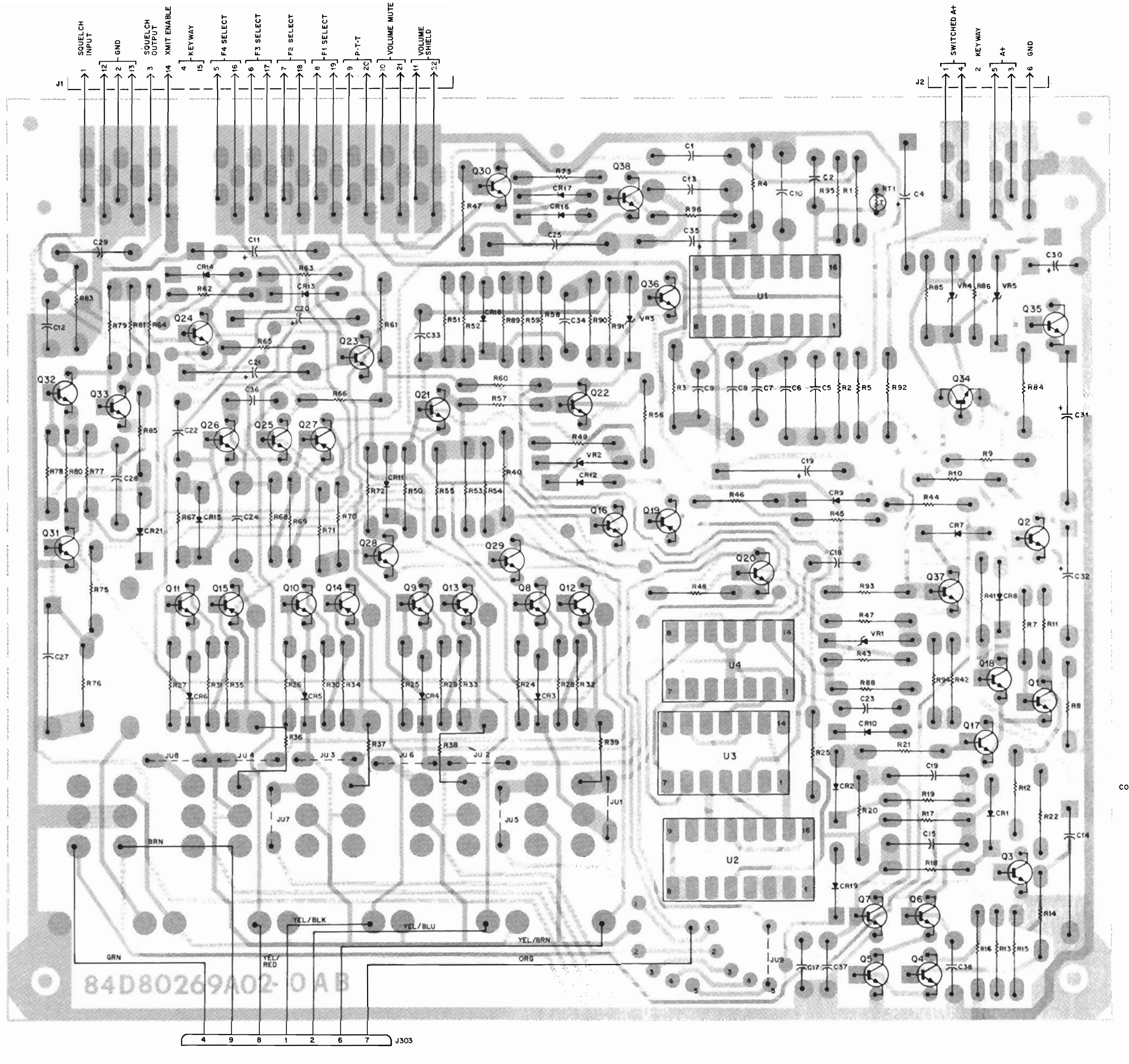


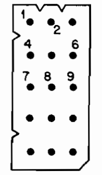
* SHOWS PRIORITY ELEMENT BEING SCANNED DURING TIME INTERVAL WHEN NON-PRIORITY COUNTER AND PRIORITY DRIVER IS SAMPLING CHANNEL SUCCESSIVELY. EXAMPLE WITH F3 AS PRIORITY: F1, F3, F2, F3, F3, F3, F4, F3, ETC.

EPS–6628–A



SHOWN FROM SOLDER SIDE

SOLDER SIDE BD-EEPS-27276-B
COMPONENT SIDE BD-EEPS-27275-B
OL-EEPS-28097-A



VIEWED FROM PIN SIDE

J303

"Channel-Scan" Monitor
Schematic Diagram and Circuit Board Detail
Motorola No. ***PEPS-28078-A***
(Sheet 1 of 2)
2-24-84 GGI

parts list

HLN4143A "Channel-Scan" Monitor Board — PL-6761-A

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed: uF ± 10%; 50 V; unless otherwise stated:
C1	8-84637L21	0.15; 100 V
C2	21-84715E35	200 pF ± 5%
C4	23-83214C15	4.7 ± 20%; 25 V
C5	8-83813H28	.01 ± 5%; 100 V
C6	8-82905G07	0.1
C7	21-80067A65	100 pF ± 5%; 200 V
C8	8-83813H28	.01 ± 5%; 100 V
C9	21-82428B28	.002; 100 V
C10	8-84637L22	0.22; 100 V
C11	23-82783B16	2.2; 15 V
C12	21-82372C04	.05 + 80-20%; 25 V
C13	8-84637L22	0.22; 100 V
C14	23-82783B27	10; 25 V
C15, 16	8-82905G31	0.15
C17, 18	21-832501	.01 + 60-40%; 250 V
C19	23-865137	4.7
C20,21	23-82783B16	2.2; 15 V
C22, 23	8-82905G02	.022; 100 V
C24	8-84637L22	0.33; 100 V
C25	8-84637L39	0.39; 100 V
C27	23-83214C15	4.7
C28	8-82905G40	.030
C29	21-82372C09	0.1 + 80-20%; 25 V
C30	23-84538G06	47 ± 20%; 20 V
C31	23-83214C02	15 ± 20%; 25 V
C32	23-83214C17	3.3 ± 20%; 15 V
C33	21-832501	.01 + 60-40%; 250 V
C34	8-84637L02	.033 ± 5%
C35	23-84762H08	3.9 ± 20%; 15 V
C36, 37, 38	21-82428B28	.002; 200 V
		semiconductor device, diode: (see note)
CR1 thru 19	48-83654H01	silicon
CR21	48-83654H01	silicon
		integrated circuit: (see note)
U1	51-84267A09	type M6709
U2	51-84084D15	type M84D15
U3	51-84084D20	type M84D20
U4	51-84084D21	type M84D21
		connector, receptacle:
J1		consists of contact terminals mounted on edge of circuit board, as follows:
	28-84269C01	TERMINAL, contact; narrow mounting tab (lower row)
	28-84269C02	TERMINAL, contact; wide mounting tab (upper row)
J2		consists of contact terminals mounted on edge of circuit board, as follows:
	28-84269C01	TERMINAL, contact; narrow mounting tab (lower row)
	28-84269C02	TERMINAL, contact; wide mounting tab (upper row)
		transistor: (see note)
Q1 thru 11	48-869570	NPN; type M9570
Q12 thru 15	48-869571	PNP; type M9571
Q16 thru 18	48-869570	NPN; type M9570
Q19	48-869571	PNP; type M9571
Q20	48-869567	NPN; type M9567
Q21 thru 26	48-869570	NPN; type M9570
Q27	48-869571	PNP; type M9571
Q28	48-869570	NPN; type M9570
Q29	48-869567	NPN; type M9567
Q30	48-869528	NPN; type M9528
Q31 thru 33	48-869570	NPN; type M9570
Q34	48-869428	NPN; type M9428
Q35	48-869568	NPN; type M9568
Q36	48-869570	NPN; type M9570
Q37	48-869642	NPN; type M9642
		resistor, fixed: ± 5%; 1/4 W; unless otherwise stated:
R1	6-124A82	24k
R2	6-124A43	560
R3	6-124A51	1.2k
R4	6-124B04	180k
R5	6-124A81	22k
R7, 8	6-124A81	22k
R9, 10	6-124A65	4.7k
R11, 12	6-124A49	1k
R13, 14, 15	6-124A91	56k
R16	6-124A89	47k
R17	6-124A73	10k
R18, 19	6-124A91	56k
R20	6-124A73	10k
R21	6-124A83	27k
R22	6-124A73	10k
R23 thru 27	6-124A49	1k
R28 thru 31	6-124A51	1.2k
R32 thru 35	6-124A73	10k
R36 thru 39	6-124C75	12k ± 10%
R40	6-124B02	150k

REFERENCE SYMBOL	MOTOROLA PART NUMBER	DESCRIPTION
R41, 42	6-124A81	22k
R43	6-124A89	47k
R44	6-124A01	10
R45, 46	6-124A81	22k
R47	6-124A65	4.7k
R48	6-124A83	27k
R49	6-124A65	4.7k
R50	6-124A73	10k
R51, 52	6-124A89	47k
R53	6-124A65	4.7k
R54	6-124A89	47k
R55, 56	6-124A73	10k
R57	6-124A65	4.7k
R58	6-124A73	10k
R59	6-124A89	47k
R60	6-124A65	4.7k
R61	6-124A73	10k
R62, 63	6-124A93	68k
R64	6-124A73	10k
R65	6-124A83	27k
R66	6-124A73	10k
R67	6-124A97	100k
R68, 69, 70	6-124A73	10k
R71	6-124A89	47k
R72	6-124A65	4.7k
R73	6-124A61	3.3k
R74	6-124A83	27k
R75	6-124A85	33k
R76	6-124A73	10k
R77	6-124A33	220
R78	6-124A41	470
R79	6-124A49	1k
R80	6-124A61	3.3k
R81	6-124A31	180
R82	6-124A61	3.3k
R83	6-124A50	1.1k
R84	6-124A11	27
R85	6-131276	150
R86	6-124A49	1k
R88	6-124A93	68k
R89	6-124A89	47k
R90	6-124A83	27k
R91, 92, 93	6-124A89	47k
R94	6-124A81	22k
R95	6-124A85	33k
		thermistor:
RT1	6-83600K08	20k @ 25° C
		voltage regulator: (see note)
VR1, 2, 3	48-82256C15	Zener type: 5.1 V
VR4	48-82256C03	Zener type: 4.7 V
VR5	48-82256C12	Zener type: 5.6 V
		non-referenced items
	26-84018B01	HEATSINK, transistor
	4-483513	WASHER, insulating
	42-10217A02	STRAP TIE; 2 used
	42-10405A01	CLIP, splicing

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

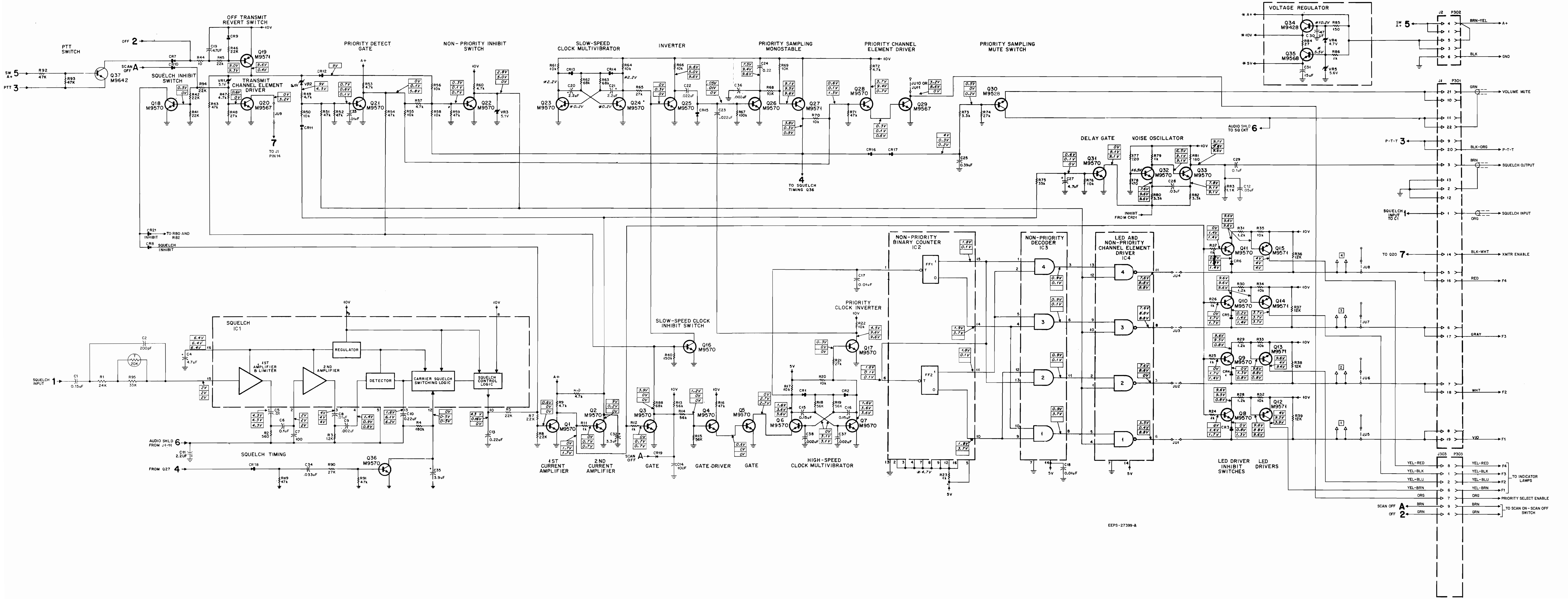
HKN4054A "Channel-Scan" Switch and Cable Kit — PL-6765-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		light emitting diode: (see note)
DS1 thru 4	48-88245C09	yellow
		connector, receptacle:
J303		consists of: 15-83293K01 HOUSING, 15-position; 29-84706E05 TERMINAL, pin; 7 used
		connector, plug:
P301		consists of: 14-84556B06 HOUSING: 22-position 9-84151B03 RECEPTACLE, contact; 5 used 9-84151B05 RECEPTACLE, contact; 6 used
P302		consists of: 14-84590B06 HOUSING: 5-position 9-84151B03 RECEPTACLE, contact 9-84151B05 RECEPTACLE, contact; 2 used
		resistor, fixed:
R101	6-125A41	470 ± 5%; 1/2 W
		switch:
S101	40-84342C01	rotary, 4-position
S102	40-83303G05	lever, 2-position locking
		mechanical parts
	1-80703T36	CABLE, assy. includes: ref. item P301
	30-824274	CONDUCTOR, shielded: grn.; 22" used
	30-824276	CONDUCTOR, shielded: brn.; 22" used
	30-824278	CONDUCTOR, shielded: orn., 19" used
	42-10217A02	STRAP, tie; 3 used
	2-8382	NUT, hex: 15/32-32 x 9/16 x 3/32"
	4-8424	WASHER, lock #25/32 in.
	64-80191B02	PANEL, insert

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

HLN4131A "Channel Scan" Hardware Kit — PL-6762-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
	3-129954	SCREW, machine: 4-40 x 3/8"; 4 used
	3-134184	SCREW, tapping: 4-40 x 3/8"; 4 used
	4-10058B12	WASHER, insulator; 4 used
	14-80290B01	INSULATOR
	36-84361K01	KNOB (transmit/receive)
	36-84362K01	KNOB (priority select)
	42-10217A02	STRAP, tie; 2 used
	43-84115C03	SPACER, threaded; 4 used
	64-83071G40	PANEL, switch insert
	64-83071G61	PANEL, switch insert



NOTES:

1. ALL VOLTAGE MEASUREMENTS ARE REFERENCED TO B- WITH 13.8 V DC APPLIED AND THE SQUELCH CONTROL SET AT THRESHOLD. INPUT SIGNAL LEVEL, WHEN APPLIED, IS 100 UV.

   ___V — UNIT ON *OR* OFF.

   ___V — UNIT OFF.
   ___V — UNIT SCANNING; NO RF CARRIER PRESENT.

   ___V — UNIT SCANNING; NO RF CARRIER PRESENT.
   ___V — UNIT RECEIVING A NON-PRIORITY SIGNAL ON F1, F2 SELECTED FOR PRIORITY.
   ___V — UNIT RECEIVING A PRIORITY SIGNAL ON F2.

2. ALL RESISTOR VALUES ARE GIVEN IN OHMS UNLESS OTHERWISE NOTED. K = KILOHM.

3. ALL CAPACITOR VALUES ARE GIVEN IN PPICOFARADS UNLESS OTHERWISE NOTED. UF = MICROFARADS.

4. VOLTAGE DEPENDENT ON SIGNAL INPUT. VOLTAGE LOW WITH STRONG SIGNAL. HIGH WITH WEAK SIGNAL.

5. JUMPER USAGE ON THIS BOARD IS AS FOLLOWS:

   JUMPERS JU1-JU9 ARE IN;
   JUMPERS JU10 AND JU11 ARE OUT.

6. JUMPER 508 (ON THE CHASSIS BETWEEN TB1-3 AND TB2-4) IS REMOVED.

7. COIL L401 AND DIODE CR404 ARE REMOVED FROM THE TRANSMITTER-RECEIVER UNIT ON ALL MODELS EXCEPT UHF (L44JJB AND L54-JJB SERIES) STATIONS.

8. RESISTORS R8 AND R11 ARE REMOVED FROM THE HLN4132A INTERFACE BOARD ON UHF (L44JJB AND L54JJB SERIES) STATIONS *ONLY*.

EPS-28081-O

"Channel-Scan" Monitor
Schematic Diagram and Circuit Board Detail
Motorola No. PEPS-28078-A
(Sheet 2 of 2)
2-24-84 GGI

DIGITAL ELECTRONIC CLOCK

MODELS TRN6125A AND TRN6703A

MODEL	APPLICATION
TRN6125A	"Super Consolette" Base Stations
TRN6703A	"Consolette" Base Stations

1. DESCRIPTION

Either clock kit is a 12- or 24-hour digital clock which may be used with either 50 or 60 Hz ac power sources. All components are mounted on a printed circuit board which mounts behind the control panel. The digital readouts are permanently mounted at a convenient angle to assure proper viewing when installed within the control panel.

2. FUNCTIONAL OPERATION

(See Schematic Diagram and Circuit Board Detail PEPS-17369.) Accuracy of the clock is determined by the line frequency. The 60 Hz (or 50 Hz) power line frequency serves as the external clock input to drive the integrated circuit decade counters. Jumper JU2 determines the counting rate of the circuit and must be cut when operating from 50 Hz power. Jumper JU1, when removed, changes the divide rate from ÷12 to ÷24 (hours) and allows the kit to function as a 24-hour clock.

Integrated circuit U1 has two primary outputs: a multiplexed seven-segment output and a digit enable output. Both outputs are related to the strobe frequency of U1. The strobe, which operates at a frequency of approximately 450 Hz, generates pulses which drive a divider/decoder. The divider/decoder output is the strobe frequency divided by four (the decoder has four output lines) or approximately 112 Hz on any one line alternately. The divider/decoder outputs drive the digit enable transistors sequentially and these apply power to the anodes of A1 through A4.

The seven-segment output of the multiplexer consists of a series of logic highs or lows on each line depending upon the digit to be indicated (Table 1). The seven-segment lines are common to all the readouts. The pulse, which gates on a digit enable transistor (Q1-Q4), also interrogates the multiplexer to supply the seven-segment code for a digit to the appropriate readout. Only the readout having an enable pulse will indicate. The next output pulse from the divider/decoder gates on the adjacent digit enable transistor and also causes the multiplexer to release the seven-segment code for the associated digit. This means that each digit is actually lit for one quarter of the 450 Hz strobe frequency, or approximately 2.0 milliseconds.

Table 1. Multiplexer Seven-Segment Output Code

U1 Multiplexed 7-Segment Outputs							Digit Portrayed
10	9	8	7	6	5	4	A1-A4
0	1	1	1	1	1	1	0
0	0	0	0	1	1	0	1
1	0	1	1	0	1	1	2
1	0	0	1	1	1	1	3
1	1	0	0	1	1	0	4
1	1	0	1	1	0	1	5
1	1	1	1	1	0	0	6
0	0	0	0	1	1	1	7
1	1	1	1	1	1	1	8
1	1	0	0	1	1	1	9

*Positive logic is assumed, 1 is high and 0 is low.

MOTOROLA INC.
Communications Division

service publications
1301 E. Algonquin Road, Schaumburg, IL 60196

3. MAINTENANCE

3.1 TEST EQUIPMENT REQUIRED

(1) Oscilloscope

(2) S1063B Motorola Solid-State DC Multimeter, or equivalent.

3.2 TEST PROCEDURE

The troubleshooting chart shown in Figure 1 will aid in the servicing of this clock kit. The kit may be tested while installed in the base station or it may be tested on a bench. If tested on the bench, make the following connections to the clock kit printed circuit board:

(1) Connect a ground to pin 1.

(2) Connect A+ (13.8 V dc) to pin 3.

(3) Apply a 50 Hz or 60 Hz (depending on the status of JU2) half-wave rectified signal (approximately 25 V p-p) to pin 2.

4. REFERENCE DIAGRAM

TRN6125A/TRN6703A Clock Kits
Schematic Diagram and
Circuit Board Detail. . . PEPS-17369

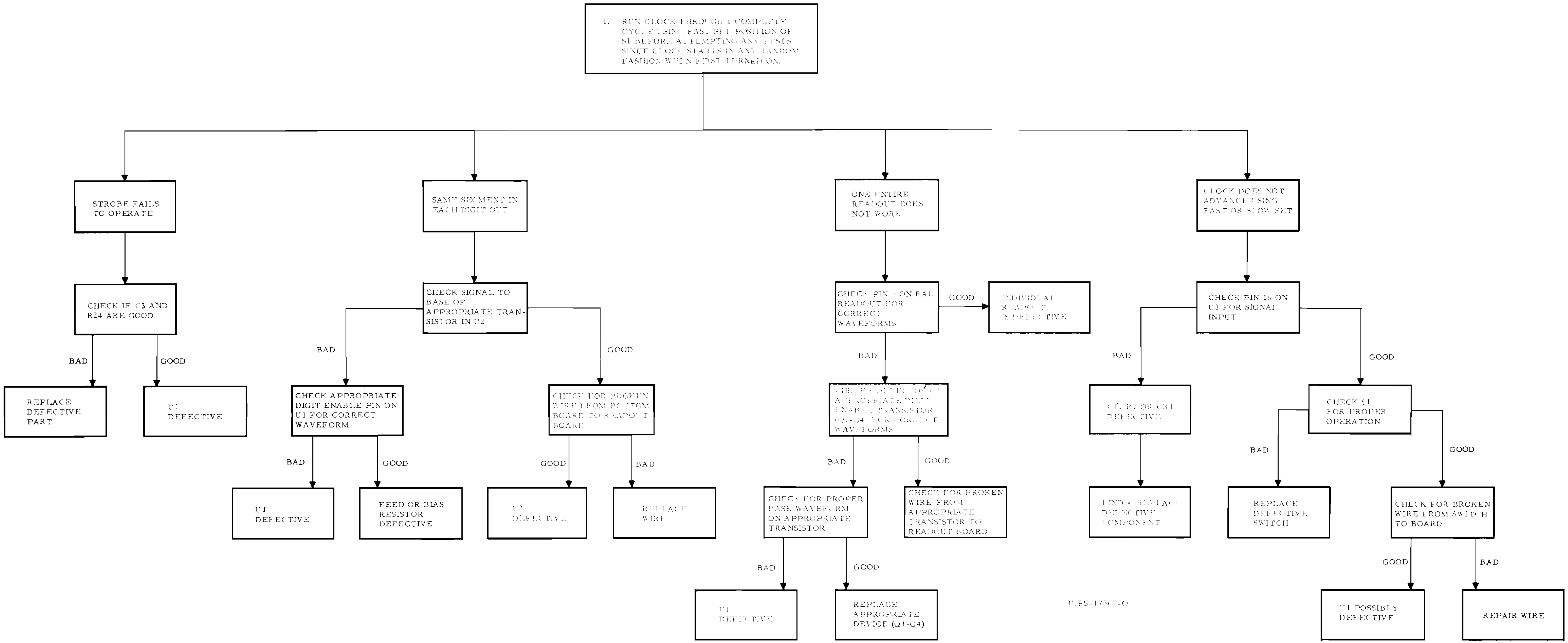


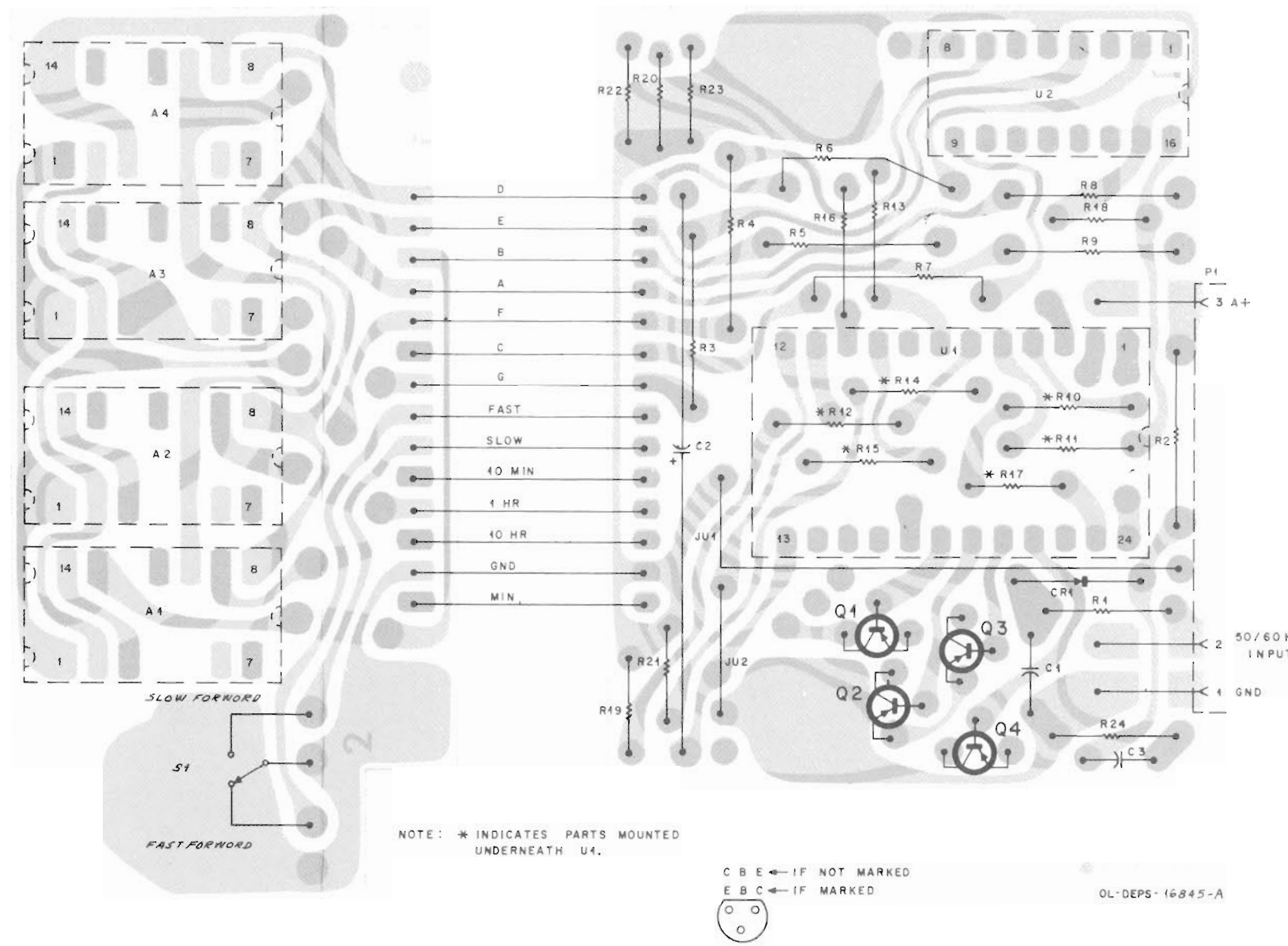
Figure 1. Clock Kit Troubleshooting Chart

PARTS LIST

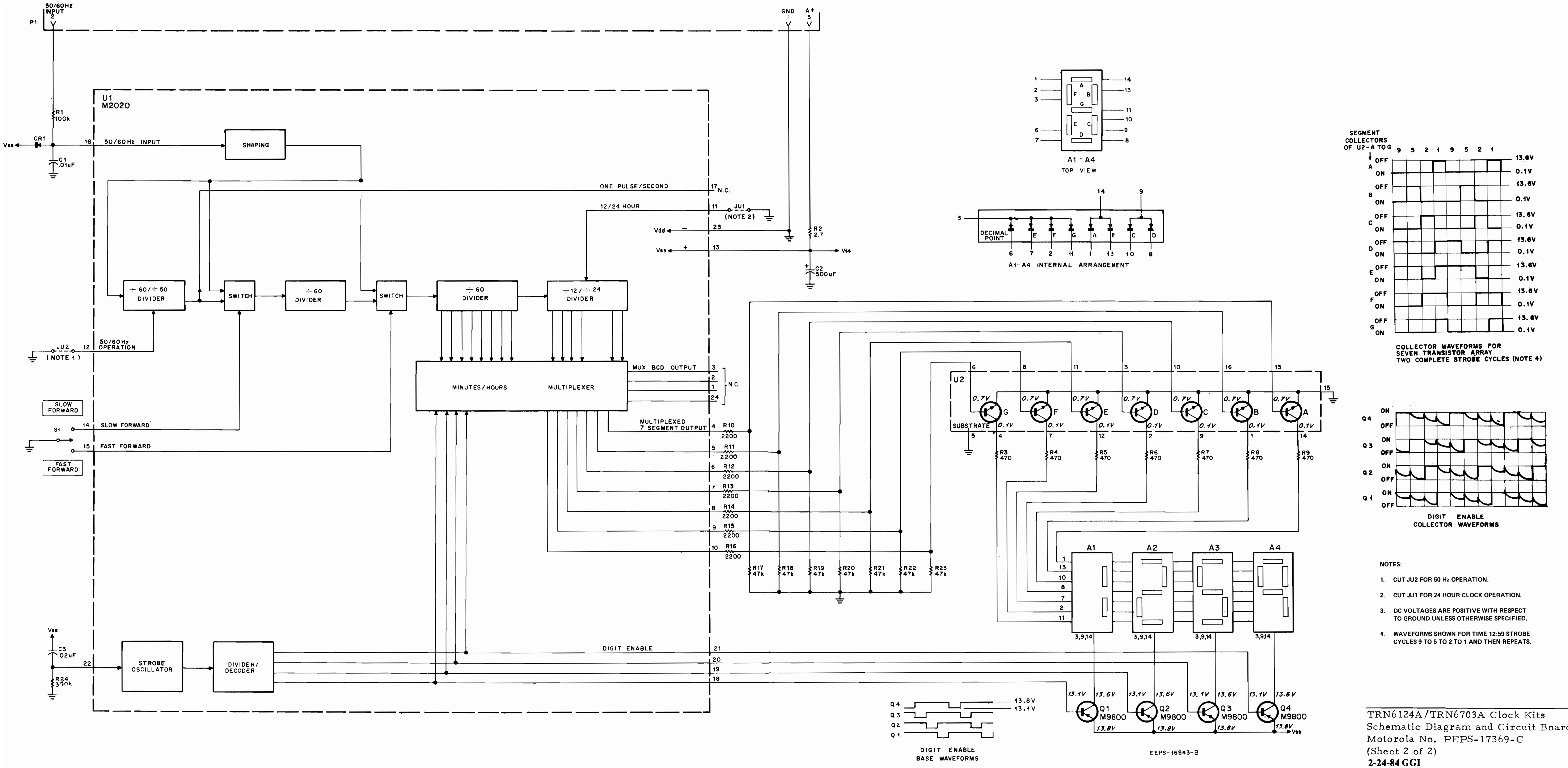
TRN6125A/TRN6703A Clock Kits PL-3337-D

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		LIGHT EMITTING DIODE ARRAY:
A1 thru 4	48-84405E06	7 segment
		CAPACITOR, fixed: uF; 200 V; unless otherwise stated
C1	21-82428B59	.01 ±20%
C2	23-83210A19	500 +100-10%; 20 V
C3	21-82428B26	.02 +80-20%
		SEMICONDUCTOR DEVICE, diode: (SEE NOTE)
CR1	48-83654H01	silicon
		TRANSISTOR: (SEE NOTE)
Q1 thru 4	48-869800	PNP: type M9800
		RESISTOR, fixed: ±10%; 1/4 W; unless otherwise stated
R1	6-124C97	100k
R2	6-125D55	2.7: 1/2 W
R3 thru 9	6-125C41	470: 1/2 W
R10 thru 16	6-124C57	2.2k
R17 thru 23	6-185B99	47k: 1/8 W
R24	6-124D12	390k
		SWITCH, toggle:
S1	40B83402K02	spdt, normally open
		INTEGRATED CIRCUIT:
U1	51-84320A20	type M2020
U2	51-84320A32	type 20A32
NON-REFERENCED ITEMS		
	9-83965G01	CONTACT, receptacle: 3 req'd.
	7-82868K01	BRACKET
	64-84217A04	FACEPLATE (TRN6125A)
	64-84217A03	FACEPLATE (TRN6703A)
	61-83066K01	LENS
	43-84115C03	SPACER: 2 req'd.

NOTE:
For optimum performance, replacement diodes and transistors must be ordered by Motorola part number.



SHOWN FROM COMPONENT SIDE



NOTES:

1. CUT JU2 FOR 50 Hz OPERATION.
2. CUT JU1 FOR 24 HOUR CLOCK OPERATION.
3. DC VOLTAGES ARE POSITIVE WITH RESPECT TO GROUND UNLESS OTHERWISE SPECIFIED.
4. WAVEFORMS SHOWN FOR TIME 12:59 STROBE CYCLES 9 TO 5 TO 2 TO 1 AND THEN REPEATS.

DIGITAL ELECTRONIC CLOCK

TRN6124A/TRN6703A Clock Kits
Schematic Diagram and Circuit Board Detail
Motorola No. PEPS-17369-C
(Sheet 2 of 2)
2-24-84 GGI

MOTOROLA INC.
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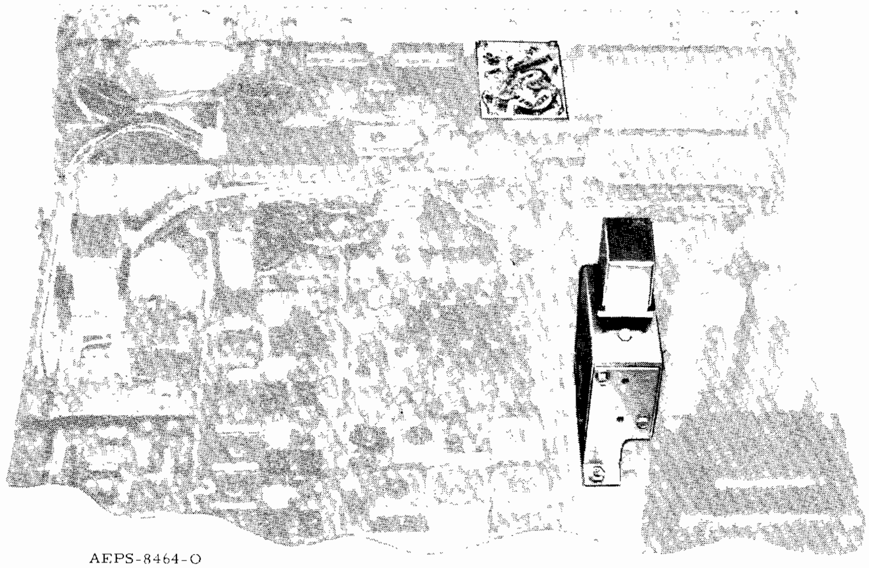
EMERGENCY POWER REVERTING KIT

MODEL TLN1374A
MODEL TLN1374B



AEPS-8464-O

1. DESCRIPTION

This unit is for use with a **Consolette** type base station. It automatically switches the station to a 12-volt dc standby power source in the event of primary ac power source failure. A visual indication of standby power usage is provided by causing the base station green power-on lamp to flash while using standby power.

The station automatically reverts to primary ac power operation and the power-on lamp returns to steady operation when the primary ac power source is restored.

A "trickle" charging circuit maintains a normally charged battery at full capacity for extended periods of time. However, lead-antimony batteries must be removed and equalized (charged) periodically as determined by the battery type and operating conditions.

2. THEORY OF OPERATION

Operation from primary or standby power is controlled by transistor Q651 which is connected as a diode. The transistor "monitors" the power supply output voltage at J201-M1 and -R1. While +13.5 volts dc is present at these pins, Q651 is reversed biased and resistor R651 limits the charging current to the standby battery. When ac power is lost, +13.5 volts dc is removed from J201-M1 and -R1, and Q651 becomes forward biased causing standby battery power to be routed to the station.

The station power-on lamp flashing is controlled by the warning light circuit board. This circuit consists of an astable multivibrator, Q601 and Q603, a lamp driver transistor Q604, and a dc sense amplifier Q602. Primary ac power to the station is rectified by the power supply bridge and applied to its regulator circuit. A sample

(20 V dc) is routed to the warning light circuit board. This dc voltage causes the 8.2 volt Zener diode to breakdown and forward bias transistor Q602. The voltage is sufficient to saturate transistor Q602, which, in turn, applies a ground potential to the anode of diode CR603. The ground on the anode of CR603 removes the base drive from Q603 which results in a positive potential at its collector. The positive potential reverse biases CR604 and allows A+ to reach the base of Q604. The voltage divided A+ voltage forward biases Q604, which presents a ground potential to the power-on lamp and turns it on. A+ is applied to the lamp continuously while the station is turned "on".

During a power failure, the anode of CR603 is not "tied" to ground through Q602 since the lack of the dc sample input prevents Q602 from turning on. While Q602 is off, astable transistor Q603 and Q601 turn on and off alternately. This causes Q604 to turn on and off alternately, presenting an interrupted switched ground to the power-on lamp which causes it to flash.

3. INSTALLATION

3.1 GENERAL

Locate the battery (or batteries) in a secure place, as close to the station as possible (battery cables should be kept as short as possible). The location must be adequately ventilated to provide unobstructed air circulation and should be fully accessible for inspection and maintenance. The battery must not be placed near radiators, boilers, or other heat-producing devices, or in direct sunlight.

3.2 REVERT PLUG INSTALLATION

Step 1. Turn off the base station power.

Step 2. Unplug the base station from the power source.

Step 3. Remove the base station cabinet.

Step 4. Disconnect the 15-pin power cable plug from the power supply (item 4 in Figure 1).

Step 5. Remove the screws indicated by item 5 in Figure 1.

Step 6. Remove two screws at the back of the power supply below the heat sink (item 6 in Figure 1).

Step 7. Lift the power supply chassis (with ac line cord attached) straight up and away from the base station chassis).

Step 8. Connect the emergency reverting kit to the power supply (item 8 in Figure 2).

Step 9. Tighten screws (item 9 in Figure 2).

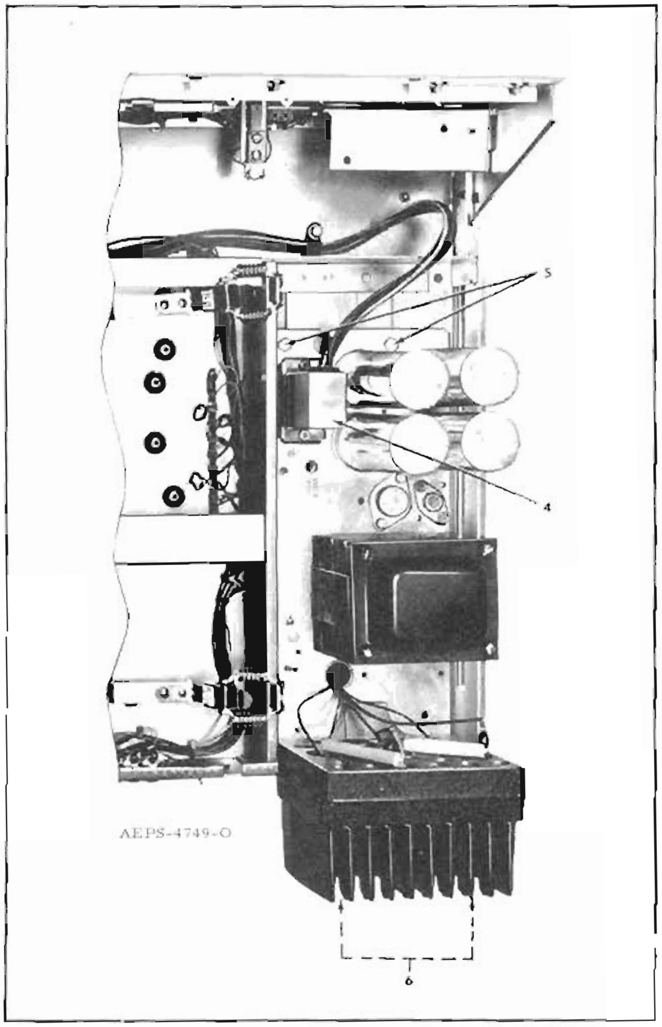


Figure 1. Power Supply Removal

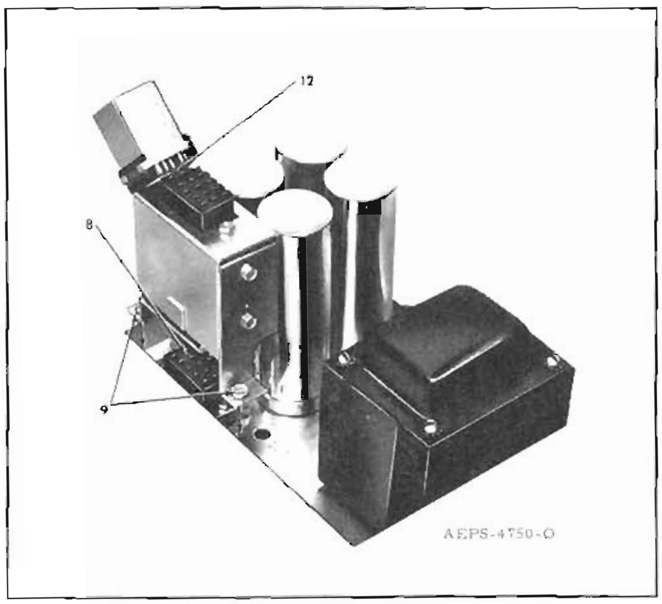


Figure 2. Emergency Reverting Kit Installation

Step 10. Reroute the RED and BLK leads underneath the power supply as illustrated in Figure 3.

Step 11. Reinstall the power supply in the base station.

Step 12. Connect the 15-pin power cable plug to the emergency reverting kit as indicated at item 12 in Figure 2.

Step 13. Connect the RED lead to battery (+) and the BLK lead to battery (—).

3.3 WARNING LIGHT CIRCUIT BOARD INSTALLATION

Step 1. Attach the metal bracket to the base station front panel with screws provided as indicated at item 1 in Figure 5.

Step 2. Attach the warning light circuit board to the metal bracket with screws provided as indicated at item 2 in Figure 5.

Step 3. Solder the BLK lead to ground at TB4-8 as shown in Figure 4.

Step 4. Connect the BLU-WHT lead connector to the mating connector on the BLU-RED lead from the power supply plug J201.

Step 5. Solder the BRN-YEL lead to the RED transmit indicator lamp socket as shown in Figure 4.

Step 6. Remove the bare jumper on the green power-on indicator lamp socket. This removes ground from the lamp.

Step 7. Solder the bare end of the BLK lead with the push-on pin to the ground terminal of the GRN power-on lamp socket as shown in Figure 4. Connect push-on pin end of this lead to the warning light circuit board.

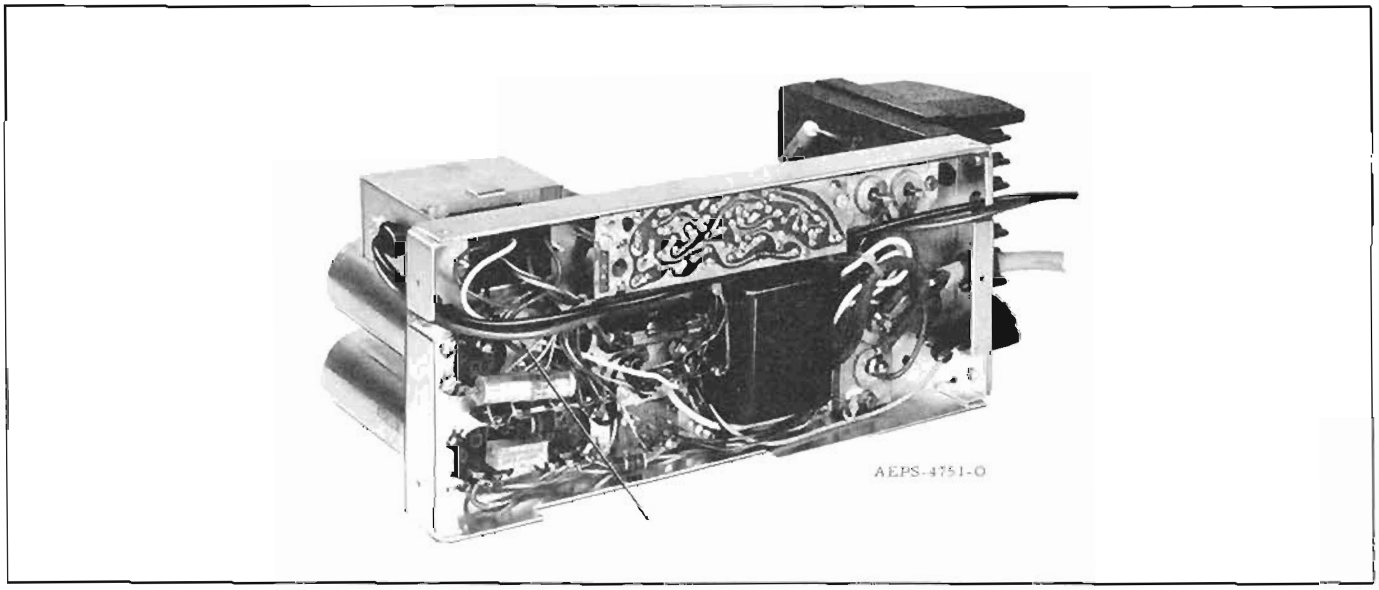


Figure 3. Battery Cable Installation

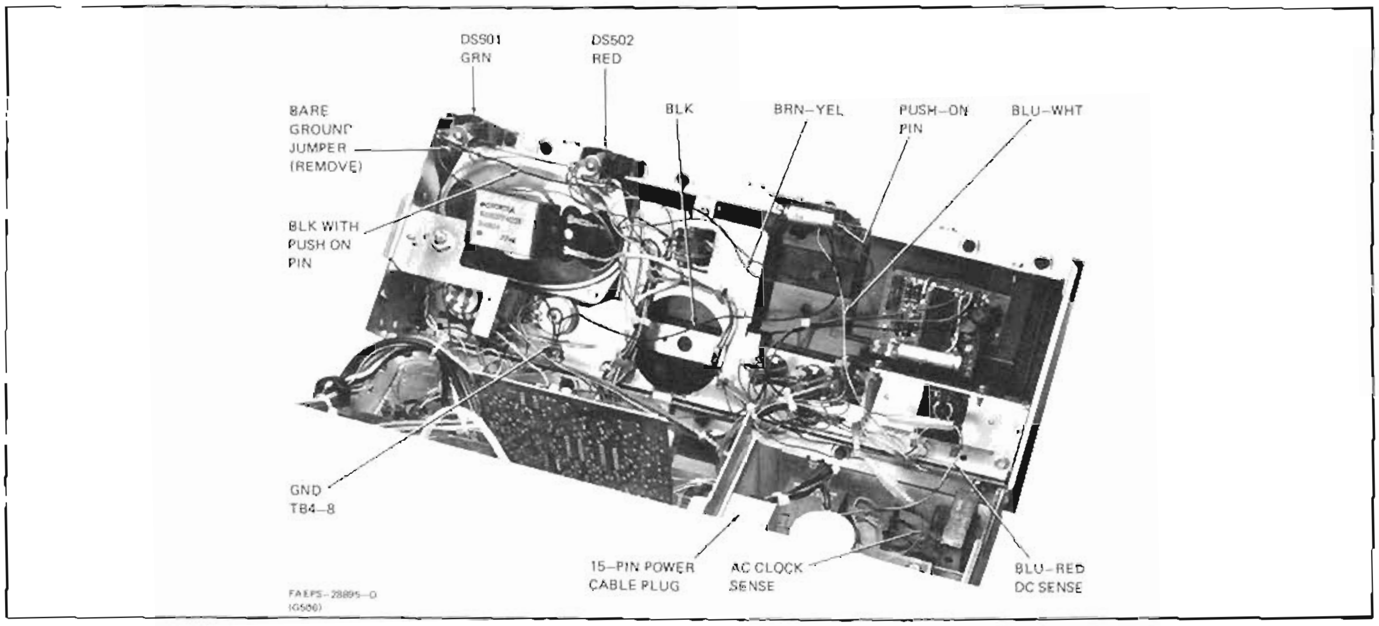


Figure 4. Connection Detail

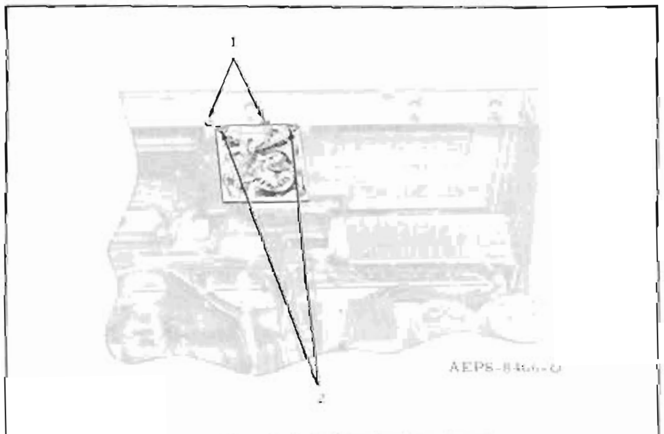


Figure 5. Bracket and Warning Light Circuit Board Installation

4. GENERAL BATTERY INFORMATION

4.1 BATTERY TYPE CONSIDERATIONS

Different types of batteries exhibit different characteristics and each type varies in performance in relation to such operating conditions as temperature, amount of use, age, etc. A brief comparison between the two battery types recommended for use with the emergency power reverting kit is given in Table 1.

Automative batteries are not designed for continuous standby service. They require frequent use, discharge and charge cycling, to maintain top efficiency. However, economics or availability may dictate their use over the stationary call type.

4.2 BATTERY CAPACITY CONSIDERATIONS

Battery capacity, or size, needed for use with the solid-state Consolette Base Station is dictated primarily by the power requirements of the station itself, the length of time power will be required, and the temperature of the battery while being used.

Assuming the receive or standby mode draws 1 ampere and the transmit mode draws 14 amperes, the 20% transmit duty cycle of the station means that an 18 ampere-hour capacity battery is required for each five hours of operation at room temperature (77°F). Ten hours of emergency operation would therefore require at least a 36 ampere-hour battery if it was fully charged initially and the battery ambinent temperature remained above 77°F while in use. Lead-calcium and lead- antimony battery performance degradation is shown in Table 2.

Table 1. Recommended Battery Types

Characteristic	Battery Type (Stationary Cells)	
	Lead - Calcium	Lead - Antimony
Life Expectancy	10-15 Years	2-5 Years
Standby Performance	Good	Poor
Add Electrolyte (Water)	Every 6 Months	Monthly
Equalize	Every 3 Months	Monthly

CAUTION

Care must be exercised below 0 F to prevent discharged batteries from freezing.

Table 2. Battery Performance Degradation

Temperature	Capacity
77°F	100%
32°F	72%
0°F	47%

5. MAINTENANCE

5.1 ROUTINE MAINTENANCE

The battery or batteries used for emergency power require certain routine maintenance procedures to assure long trouble-free operation. Persons servicing the batteries should refer to the manufacturer's recommendations for routine maintenance. In addition, certain maintenance procedures are appropriate following each interval of emergency power operation, especially if the battery has been completely discharged.

CAUTION

The battery or batteries must be disconnected from the station while being charged.

The importance of keeping good battery maintenance records cannot be over-emphasized. The battery status chart following this maintenance information allows the listing of cell voltage readings, temperature and hydrometer readings (where applicable), versus the dates on which the readings were taken. To be most effective, the battery status chart should be kept at the battery location for ready reference.

5.2 LEAD ACID BATTERIES

Perform the routine maintenance procedures monthly.

- Clean the battery and inspect it for damage.
- Measure cell voltages and enter the voltage readings on your maintenance report. Most maintenance schedules require voltage readings of every cell each time maintenance is performed. If a difference of .05 volt or more exists between any two cells, apply an "equalizing charge" to the battery for the number of hours recommended by the manufacturer for a terminal voltage of 13.5 volts.
- Take specific gravity readings with a hydrometer calibrated for the type of electrolyte used.

  — Observe the necessary precautions to see that the readings are accurate, that no chemical contamination of the cells occurs, and to prevent bodily injury from contact with the electrolyte.

  — After taking a reading, always return the electrocyte in the hydrometer syringe to the cell from which it came. (Failure to do so will decrease the specific gravity of the cell when water is added to fill up the cell.)

  — For an accurate comparison with "standard" specific gravity readings, as published in manufacturer's specifications, a correction factor must be applied to all readings to normalize them with the standard values, when taken at temperatures other than 77° Fahrenheit. However, if the battery temperature tends to be the same each time specific gravity readings are taken, a trend toward a change in specific gravity will be apparent without having to apply the correction factor to the readings.

  — The correction factor is easily applied, due to a linear relationship between changes in temperature and specifc gravity above and below 77° F. For each three degrees above 77°F, add .001 (known as "1 point") to the "standard" value of specific gravity. Conversely, for each three degrees below 77°F, subtract 1 point.

  — Take a specific gravity reading of the "pilot cell" monthly. If is not necessary to continually check the specific gravity of *all* cells because any gradual changes usually occur simultaneously in all cells. One cell is therefore chosen and designated the "pilot cell", and the monthly routine specific gravity readings are always taken from this one cell. (Be sure to indicate on the maintenance chart which cell is the pilot cell.)

  — Take specific gravity readings of all the battery cells every three months, and record them on the maintenance chart.

- Add water as required to keep the electrolyte solution in each cell up to a minimum level. In some batteries, the electrolyte level should be between the high-and low-level marks on the inside of each cell. If the cells have no such markers, check the manufacturer's literature. Use *distilled water only*.

NOTE

Do not use any tool on a lead-acid battery which may have been used with nickel-cadmium batteries. To do so may destroy the lead-acid battery, due to checmical contamination by electrolyte or other foreign matter from the nickel-cadmium battery existing on the surface of the tool in question.

5.3 CABLE CONNECTIONS

Cable connections to the emergency power equipment must be clean and firmly made at all times. Tighten all bolted connections yearly. Clean and remake any corroded connections.

Battery Status Chart

		Cell Voltage						Cell Specific Gravity (Temperature Corrected) Manufacturer's Standard is ________ (Pilot)					
Date	Temperature	1	2	3	4	5	6	1	2	3	4	5	6

parts list

TLN4431A Revert Plug Kit
TLN4431B Revert Plug Kit

PL-1163-C

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
This parts list covers two models of revert plug kits. Where differences exist, the ap-proiate model number is indicated in the description column.		
		fuse, cartridge:
F561	65-4637	20A, 32 V
		connector, plug:
J651		includes 14-82337A02 insulator, 15-hole; and 29-84150L01 terminal, wire, male, 6 used (TLN4431A), 9 used (TLN4431B)
		connector, receptacle:
J652		includes 14-83783A04 insulator, 15-hole; and 29-84151L01 terminal, wire, female, 6 used (TLN4431A), 9 used (TLN4431B)
		transistor: (see note)
Q651	48-869614	PNP: type M9614
		resistor, fixed: ohms:
R651	17-82177B03	4 ± 10%; 5 W
		non-referenced items
	1-80716B22	ASSEMBLY, transistor & bracket includes: referenced parts R651 and Q651:
	2-7005	NUT, 6-32 x 1/4" x 3/32"; 2 used
	3-2294	SCREW, machine, 6-32 x 1/2"
	3-122931	SCREW, machine, 6-32 x 7/16"
	4-7650	LOCKWASHER, internal, #6; 2 used
	4-82345A01	WASHER, shoulder (transistor); 2 used
	7-84483C01	BRACKET, etched (transistor mounting)
	14-857437	INSULATOR, transistor (Mica)
	29-845081	LUG, ring, #8
	29-84150L01	TERMINAL, wire, male; 2 used
	29-84151L01	TERMINAL, wire, female; 2 used
	2-1359	NUT, 10-32 x 3/8" x 1/8"
	3-7302	SCREW, machine, 10-32 x 3/8"
	3-122625	SCREW, tapping, 6-32 x 3/8"; 6 used
	3-131965	SCREW, tapping, 8-32 x 3/8"
	3-134212	SCREW, tapping, 4-40 x 5/16"; 4 used
	4-7658	LOCKWASHER, internal, #10
	7-84108C01	BRACKET, connector mounting
	10-10043A02	STRAP, tie, RED
	14-82882A01	BODY, fuseholder
	14-82883A01	CAP, fuseholder
	15-84111C01	HOUSING, connector cover
	29-824154	LUG, ring, #10; 2 used
	29-832116	LUG, ring 3/8"; 2 used
	30-858552	CABLE, battery, #12, BLK, 96" used
	30-858553	CABLE, battery, #12, RED; 96" used
	41-867068	SPRING, compression, fuseholder
	42-850861	RETAINER, cable
	42-10217A02	STRAP, tie; 8 used
	42-82884A01	CLIP, fuse; 2 used
	64-84116C01	PLATE, connector retaining
	64-84526C03	PLATE, mounting

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

MODEL	SUFFIX	SUB-MODEL	SUFFIX	DESCRIPTION
TLN1374A		TLN4431A		REVERT PLUG KIT
		TLN4482A	3	WARNING LIGHT KIT
TLN1374B		TLN4431B		REVERT PLUG KIT
		TLN4482A	3	WARNING LIGHT KIT

EPS-4747-E

TLN4422A Warning Light Kit

PL-1162-E

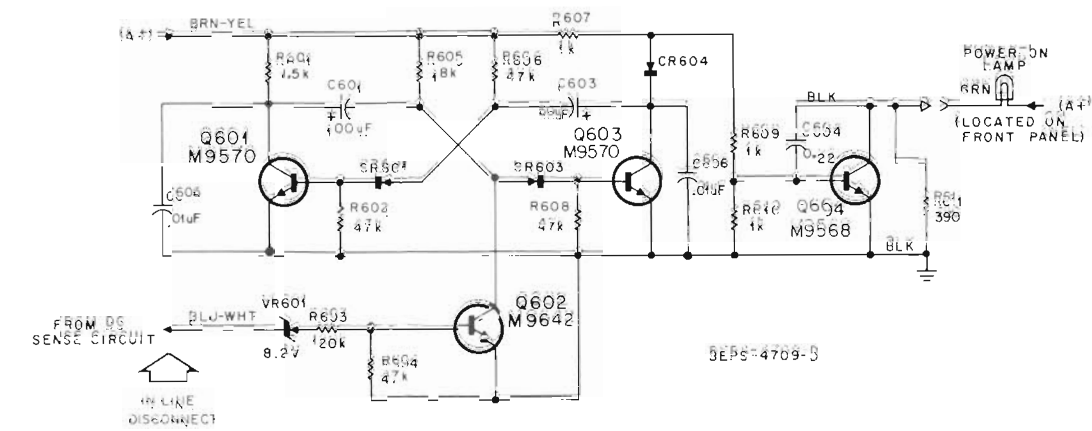
REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed, uF:
C601	23-82601A25	100 + 150-10%; 20 V
C602		NOT USED
C603	23-82601A05	50 + 150-10%; 25 V
C604	8-82905G11	0.22 ± 10%; 50 V
C605, C606	21-832501	0.01 +60-40%; 250 V
		diode: (see note)
CR601	48-82392B03	silicon
CR602		NOT USED
CR603, CR604	48-82392B03	silicon
		transistor: (see note)
Q601	48-869570	NPN; type M9570
Q602	48-869642	NPN; type M9642
Q603	48-869570	NPN; type M9570
Q604	48-869568	NPN; type M9568
		resistor, fixed ohms, ± 10%, 1/4 W: unless otherwise stated
R601	6-124C53	1.5k
R602	6-124C89	47k
R603	6-124C99	120k
R604	6-124C89	47k
R605	6-124C79	18k
R606	6-124C89	47k
R607	6-124C49	1k
R608	6-124C89	47k
R609	6-124C49	1k
R610	6-124C49	1k
R611	6-125A39	390 ± 5%; 1/2 W
		voltage regulator: (see note)
VR601	48-82256C16	silicon, type Zener; 8.2 V
		non-referenced items
	1-80702B56	ASSEMBLY, eyeleted circuit board includes:
	9-83445D01	TERMINAL, receptacle, pin, male
	1-80716B23	ASSEMBLY, wire & terminal includes:
	39-10184A24	CONTACT, receptacle, female
	14-83799G02	INSULATOR, female, terminal
	39-10184A02	CONTACT, plug

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

REVISIONS

68P81011E23-H

BOARD AND SUFFIX NO.	REF. SYMBOL	CHANGE	LOCATION
TLN1374B (TLN4482A-1)	C605, 606	ADDED .01 uF	Q601, 603
TLN1374A (TLN4482A-2)	C602	DELETED 8K868594, 0.22 uF AND REPLACED WITH VR601 48-82256C16 ZENER DIODE.	Q602
	R603	FROM 6S129147, 220K TO 6-124C99, 120K	
	Q602	FROM TYPE M9570 TO TYPE M9642	
	CR602	DELETED 48-82392B03. WAS CONNECTED BETWEEN BASE AND EMITTER OF Q602 (CATHODE TO BASE).	
TLN1374B (TLN4431B)		MODELS ADDED	
TLN4482A-3	R611	ADDED 6-125A39, 390	Q604 COLLECTOR
TLN4482A-3		WIRE COLOR CHANGED RED-WHT TO BLU-WHT	VR601 CATHODE
		MOUNTING PLATE WAS 64-84526C01	



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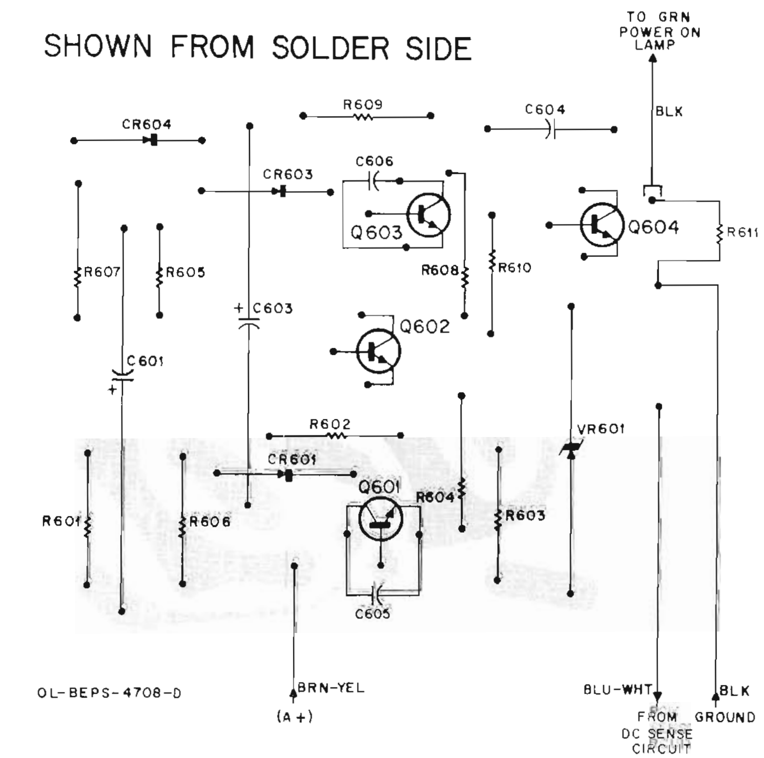
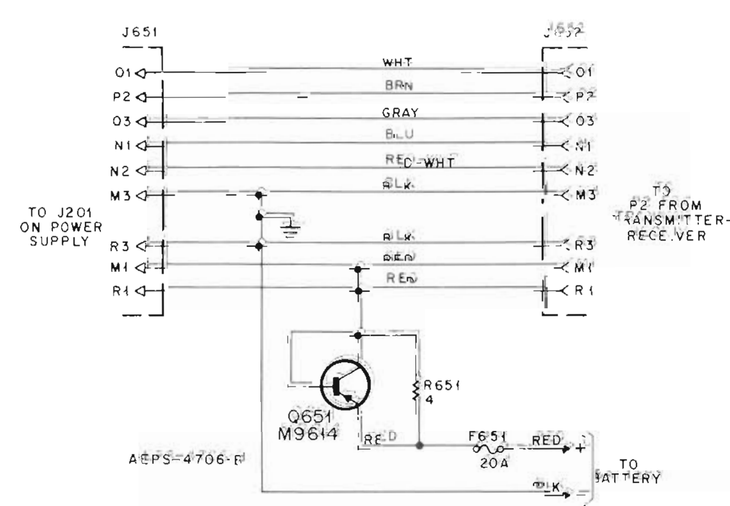




Emergency Power Reverting Kit
Schematic Diagram and Circuit Board Detail
Motorola No. ***63P81011E23-J***
2-24-84 GGI

EMERGENCY POWER REVERTING KIT

MOTOROLA
12-VOLT DC-ONLY KIT
MODEL TRN6182A

PARTS LIST

TRN6182A DC Only Kit — PL-3338-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
F201	65-84161B01	FUSE, cartridge: 40 A; 32 V
XF201	9-84277B02	FUSEHOLDER: "In-line" type
	NON-REFERENCED ITEMS	
	29-824151	LUG, terminal: 2 required
	29-832116	LUG, ring type: 2 required
	30-813233	CABLE, No. 10 black: 122 inches required
	30-831572	CABLE, No. 10 red: 118 inches required
	37-842245	STRAIN RELIEF
	42-82143C02	CLAMP, cable
	64-84682C03	PLATE, cover

1. DESCRIPTION

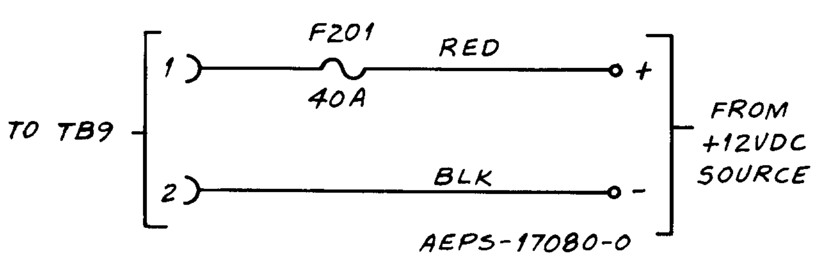
The dc-only cable kit is used in place of the ac power supply in those installations where only dc operation is required.

Two terminal lugs on the cable kit connect to TB9 in the station to provide the necessary power for operation. An in-line fuse protects the unit should a short occur.

2. INSTALLATION

As shipped from the factory, the cable kit is connected to the station terminal board TB9, and coiled in the left side of the chassis. A cover plate and an envelope with mounting hardware are taped to the chassis below the coiled cable.

Installation consists of routing the cable through the plate from the inside, and inserting the feedthrough cable strain relief from the inside. The plate mounts vertically from the inside of the chassis to cover the hole through which the heat sink of the power supply would protrude in ac powered units. It is secured using two of the self-tapping screws provided.



END OF DOCUMENT

12—VOLT DC ONLY KIT

MOTOROLA INC. Communications Division

SERVICE PUBLICATIONS 1301 E. ALGONQUIN ROAD SCHAUMBURG, ILLINOIS 60172

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