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Colin Hinson
In the village of Blunham, Bedfordshire, UK.

UHF PRE-AMPLIFIER SYSTEM
PTPE-100/101
OPERATION AND MAINTENANCE MANUAL

MOTOROLA INC.
Government Electronics Group

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SECTION 1

1. INTRODUCTION

1.1 GENERAL INFORMATION

This manual provides operation and maintenance instructions for the PTPE-100/101 Preamp System. The Preamp System consists of two packages, one containing the Preamp, the other the Preamp Control. The Preamp package amplifies and filters the signals received from the satellite, while the Control unit provides the operating voltage and the transmit/receive control to the Preamp. The PTPE-100 model includes bandpass filtering from 225 MHz to 400 MHz. The PTPE-101 passes the satellite downlink frequencies from 225 to 270 MHz, while rejecting the uplink frequencies from 290 to 400 MHz. This is especially important where more than one satellite terminal and/or other UHF transmitters are co-located. The Preamp system is fully compatible with Motorola's AN/URC-101 through -112 series satellite transceivers and with the LST-5A/B Lightweight Satellite Terminal; either system may be operated through a 200 Watt power amplifier (AM-7175/URC).

1.2. ABBREVIATIONS AND GLOSSARY

AM	AMPLITUDE MODULATION
ANT	ANTENNA
BCN	BEACON
CT	CYPHER TEXT
CW	CONTINUOUS WAVE
COMSEC	COMMUNICATIONS SECURITY
dB	DECIBEL
EIRP	EFFECTIVE ISOTROPIC RADIATED POWER
FM	FREQUENCY MODULATION
FREQ	FREQUENCY
HDST	HANDSET/HEADSET
HZ	HERZ
kHz	KILOHERZ
LED	LIGHT EMITTING DIODE
MHz	MEGAHERZ
PS	POWER SUPPLY
PT	PLAIN TEXT
PTT	PUSH-TO-TALK
RCV	RECEIVE
RF	RADIO FREQUENCY
RT	RECEIVER-TRANSMITTER
SATCOM	SATELLITE COMMUNICATIONS
SINAD	RATIO OF: $\frac{\text{SIGNAL + NOISE + DISTORTION}}{\text{NOISE + DISTORTION}}$
SQ	SQUELCH

TR	TRANSMIT-RECEIVE
UHF	ULTRA HIGH FREQUENCY
Vdc	VOLTS, DIRECT CURRENT
VOL	VOLUME
VSWR	VOLTAGE STANDING WAVE RATIO
W	WATT
X-MODE	INTERFACE CONNECTOR FOR COMSEC EQUIPMENT

1.3 EQUIPMENT DESCRIPTION

1.3.1. CONTROL UNIT

The Control Unit controls the operation of the Preamp through signals from the transceiver's X-mode connector to J1 of the Control Unit. Three signals are used to operate the Preamp system, (1) 28 Vdc operating voltage, supplied by the transceiver, (2) the PTT (push-to-talk) signal for receive/transmit control and, (3) the Synthesizer Lock line , used to inhibit the transmitter when the Preamp system is in the receive mode. This condition occurs when an AN/URC- transceiver's Beacon mode is activated. As a result, when an AN/URC- transceiver is connected to the Preamp System the Beacon mode is inhibited unless the Preamp System is turned off. (ON/OFF switch on Control Unit set to the OFF position). All other X-mode pins from the transmitter are connected to J1 to be fully X-mode compatible with peripheral equipment. This equipment, COMSEC device, FAX, or computer interface etc., connects to J2 of the Control Unit, which is a pin-to-pin connection to J1. The 28 Vdc operating voltage for the Preamp is applied to the Preamp through the coaxial cable from J4 on the Control Unit to J1 on the Preamp. This voltage is present only in the receive mode when the Preamp system is turned on. When the transmit mode is selected, by grounding the PTT line, or when the Preamp system is turned off, the 28 Vdc is removed, relays in the RF amplifier in the Preamp Unit are de-energized and the Preamp Unit is placed in a bypass mode.

1.3.2. PREAMP UNIT

The Preamp Units' internal circuitry consists of an RF amplifier (Z1), two coaxial relays (K1 and K2) and two reed relays (A1K1 and A1K2), a highpass filter (FL1), a lowpass filter (FL2) and a 12Vdc voltage regulator (U1). The RF amplifier provides the gain of the the received signal. The two coaxial relays select the path for the RF signal, either through the filters and amplifier in receive or straight through in transmit. The reed relays provide the amplifier with a minimum of 55 dB of isolation from the transmit signal. The highpass filter rejects all frequencies below 225 MHz; the lowpass filter in a PTPE-100 rejects all frequencies above 400 MHz,while the lowpass filter in a PTPE-101 rejects all frequencies above 270 MHz and provides 30 dB of attenuation to

frequencies in the range of 290 to 400 MHz, which includes the satellite uplink frequencies. The 12 Vdc regulator converts the 28 Vdc from the Control Unit to the 12 Vdc operating voltage for the RF amplifier and the reed relays.

1.4. FEATURES

Features of the PTPE-100/101 system are summarized as follows:

- 4 dB noise figure
- 11 dB gain
- no modification required to the transceiver
- no power or control cable required to the Preamp Unit
- protection from AN/URC- and LST-5A/B beacon operation
- no power source required, system is powered from the transceiver
- transceiver may be operated with a 200 Watt Power Amplifier (AM-7175/URC)

1.5. REFERENCE DATA

The operating parameters of the PTPE-100/101 Preamp System are listed in table 1-1. The physical characteristics are listed in table 1-2 and the environmental specifications are listed in table 1-3.

TABLE 1-1: OPERATING PARAMETERS

Frequency Range :	PTPE-100	225 to 400 MHz.
	PTPE-101	225 to 270 MHz
Frequency Rejection:	PTPE-101 (290 to 400 MHz)	30 dB min.
Gain:		11 dB
Noise Figure:		4 dB max.
Insertion Loss (XMT):		0.5 dB max.
Operating Voltage from Transceiver:		22 - 32 Vdc.
Operating current:		0.20 Amps max.

TABLE 1-2: MECHANICAL DATA

Preamp Unit:	Height	2.3 inches
	Width	4.4 inches
	Length	6.1 inches
	Weight	1.9 pounds
Control Unit:	Height	2.2 inches
	Width	2.5 inches
	Length	7.0 inches
	Weight	1.45 pounds

TABLE 1-3: ENVIRONMENTAL DATA

Temperature (operating)	-29°C to +55°C
Humidity	95% relative
Altitude (operating)	15,000 feet, MSL

SECTION 2

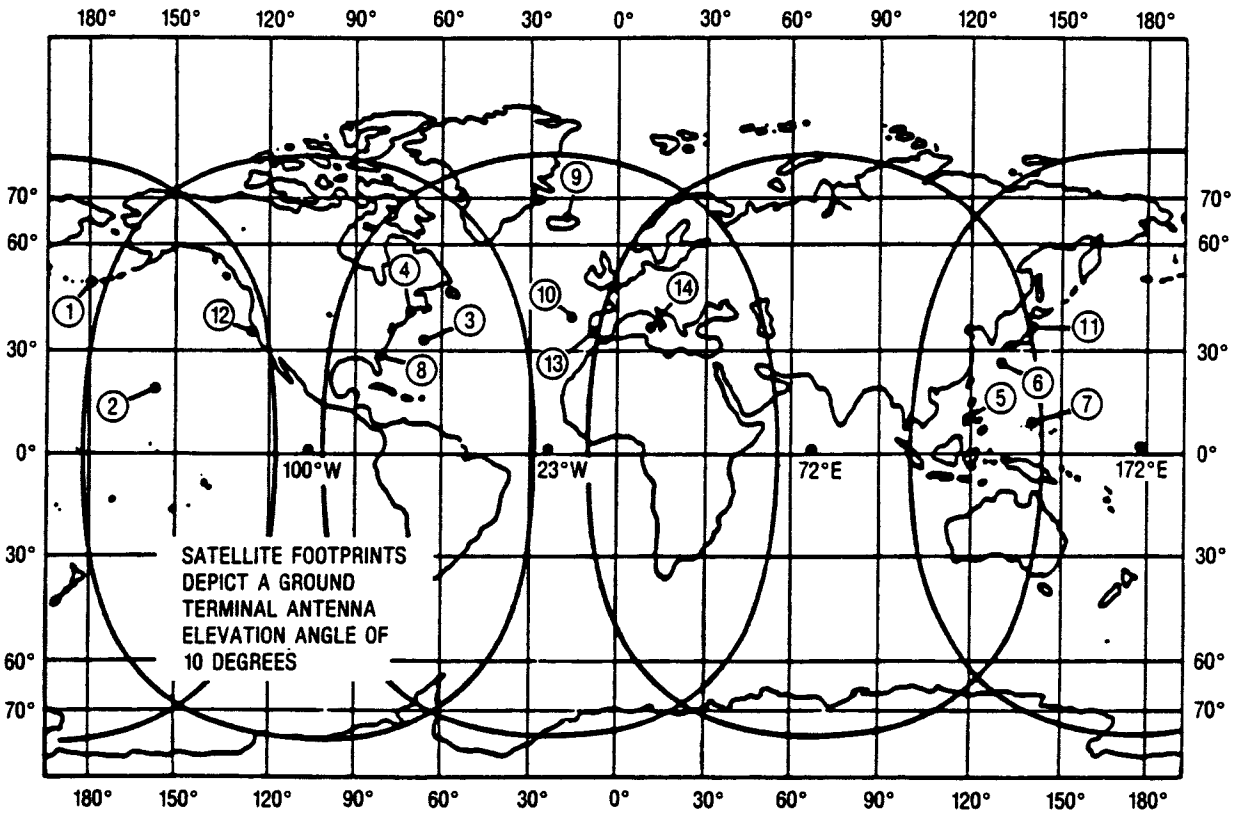
2. OPERATION

This section contains the operating instructions for the PTPE-100/101 Preamp System. For the installation instructions refer to section 3.

2.1. GENERAL INFORMATION

The PTPE-100/101 Preamp System was designed to operate with an AN/URC-101 through -112 satellite transceiver or with a LST-5A/B lightweight satellite terminal on the FLEETSAT UHF SATELLITE system. The satellites are in geostationary orbits and their locations are shown on figure 2-1. The large circles on figure 2-1 indicate the antenna patterns (footprints) of the four satellites in the FLT SAT system. The edge of the footprint depicts a ground terminal antenna elevation angle of 10 degrees.

The satellite operates as a relay station which receives an uplink frequency and translates that to a lower downlink frequency. The terminal transmits on the uplink frequency and receives on the downlink frequency.



1. ADAK, ALASKA
2. BARBER'S POINT
3. BERMUDA
4. BRUNSWICK, MAINE
5. CUBI PT, PHILIPPINES
6. KADENA, OKINAWA
7. AGANA, GUAM
8. JACKSONVILLE, FLORIDA
9. KEFLAVIK, ICELAND
10. LAJES, AZORES
11. MISAWA, JAPAN
12. MOFFETT, CALIFORNIA
13. ROTA, SPAIN
14. SIGONELLA, SICILY

20970-1

FIGURE 2-1: FLEETSAT SATELLITE LOCATIONS

2.2. CONTROLS and CONNECTORS

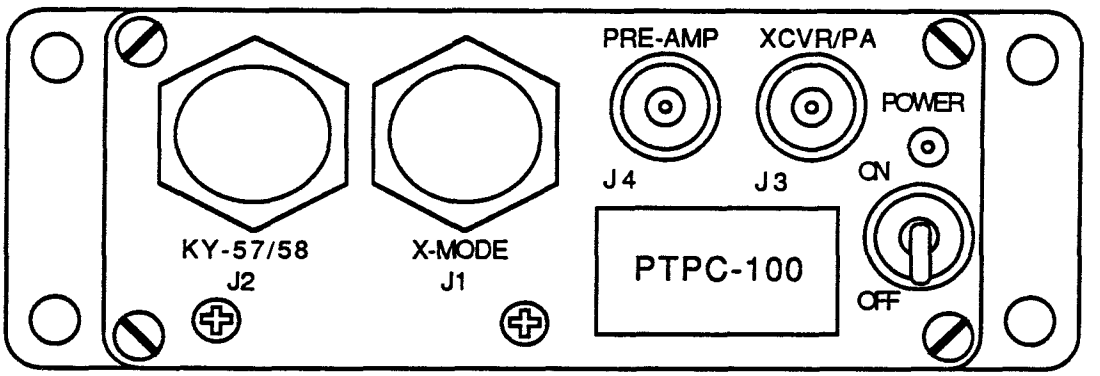


Figure 2-2: PREAMP CONTROL UNIT

TABLE 2-1: CONTROLS and CONNECTORS

PREAMP CONTROL UNIT		
CONT/CONN	TYPE	DESCRIPTION
S1 POWER ON/OFF	Toggle switch	Turns Preamp ON or OFF. The red LED, when lighted, indicates that power is turned ON
J1 X-MODE	19 pin male connector	Connects to the radio X-MODE connector. Receives the 24 Vdc operating voltage for the Preamp system, transmit/ receive information and beacon protection from the radio. Other X-MODE functions are also present.
J2 KY-57/58	19 pin female connector	Allows connection of COMSEC or other X-MODE equipment to this connector. The pin functions are the same as the AN/URC-radio's X-MODE connector
J3 XCVR/PA	"N" type coaxial connector	Connects to the antenna connector of the radio or power amplifier. Passes the receive signal to the radio and the transmit power from the radio or PA.
J4 PRE-AMP	"N" type coaxial connector	Connects to J1 of the Preamp Unit using low loss 50 Ohm coaxial cable.

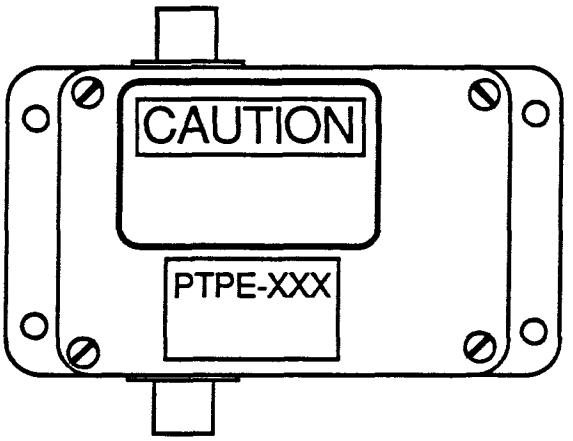


Figure 2-3: PREAMP UNIT

TABLE 2-1: (CONT.)

PREAMP UNIT		
CONT/ CONN	TYPE	DESCRIPTION
J1 - CONTROL	"N" Type	To PREAMP CONTROL UNIT
J2 - ANTENNA	"N" Type	To satellite antenna

2.3 OPERATING PROCEDURES

When the installation outlined in section 3 has been completed, the Preamp System is ready for operation. Refer to the radio's operation manual for instructions on the radio set-up. The radio's operating procedures are not effected by the installation of a Preamp Unit. The operation instructions for the Preamp Unit consist of switching the power switch ON or OFF. A red LED indicates power ON. When ON, the Preamp provides a minimum of 11 dB of receive gain and is bypassed in the transmit mode. With the power switch turned OFF, the Preamp is also in the bypass mode and the radio system operates as if the Preamp is not there.

OPERATING CAUTIONS
1. **DO NOT** bypass the Preamp Unit, connecting the Preamp Control connector J4 directly to the antenna. The Preamp Control will blow a fuse if the power switch is in the ON position.
2. **LST-5** (without A or B suffix) radios were not equipped with protection circuitry to prevent Preamp damage when the radio's beacon is activated. If a Preamp System is used with a LST-5 radio, **DO NOT** turn the beacon ON when the Preamp is turned on. Serious damage to the Preamp will result.**LST-5A** and **LST-5B** radios are fully beacon protected as well as all AN/URC- series radios

SECTION 3

3. INSTALLATION

3.1. GENERAL INFORMATION

This section contains the information necessary to install a PTPE-100/101 system in an AN/URC- series or a LST-5A/B series satellite installation.

CAUTION

DC Voltage to operate the Preamp is supplied by the PTPC-100 Preamp Control Unit via the Coax cable. **DO NOT** bypass the PTPE-100/101 and connect J4 on the Preamp Control Unit directly to the antenna unless the Preamp Control Unit ON/OFF switch is in the OFF position, or an internal fuse will blow.

3.2. DETAILED INSTALLATION

The following procedure describes the installation of a Preamp system in a AN/URC- satellite installation and in a LST-5A/B installation. In any installation it is very important that the Preamp Unit is installed as close to the antenna as possible to realize the maximum benefit from the Preamp system.

3.2.1. AN/URC- series RADIO INSTALLATION

To install the Preamp System in an AN/URC- system, connect the equipment as shown in figure 3-1, or 3-2 if an AM 7175 200 Watt Power Amp. is part of the system. Figure 3-3 shows the interconnect cable diagram.

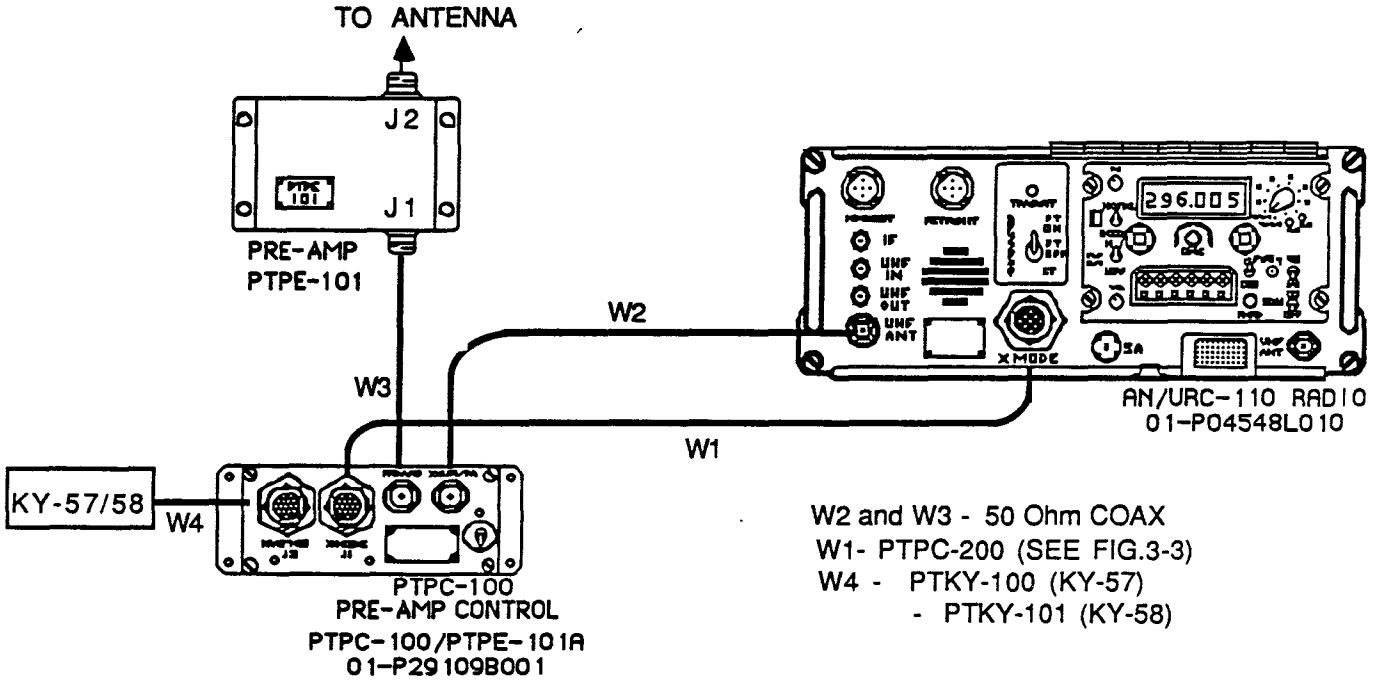


FIGURE 3-1: AN/URC- / PTPE-100/101 INSTALLATION

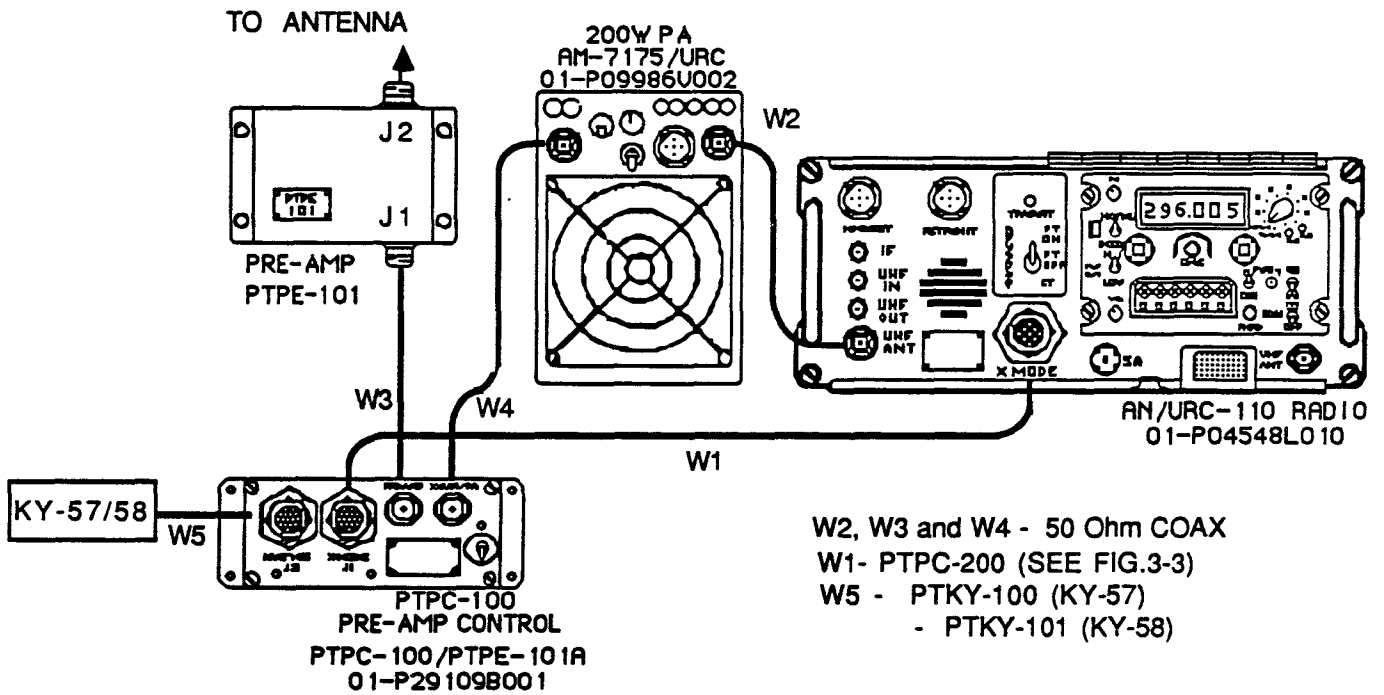


FIGURE 3-2: AN/URC- / AM-7175 / PTPE-100/101 INSTALLATION

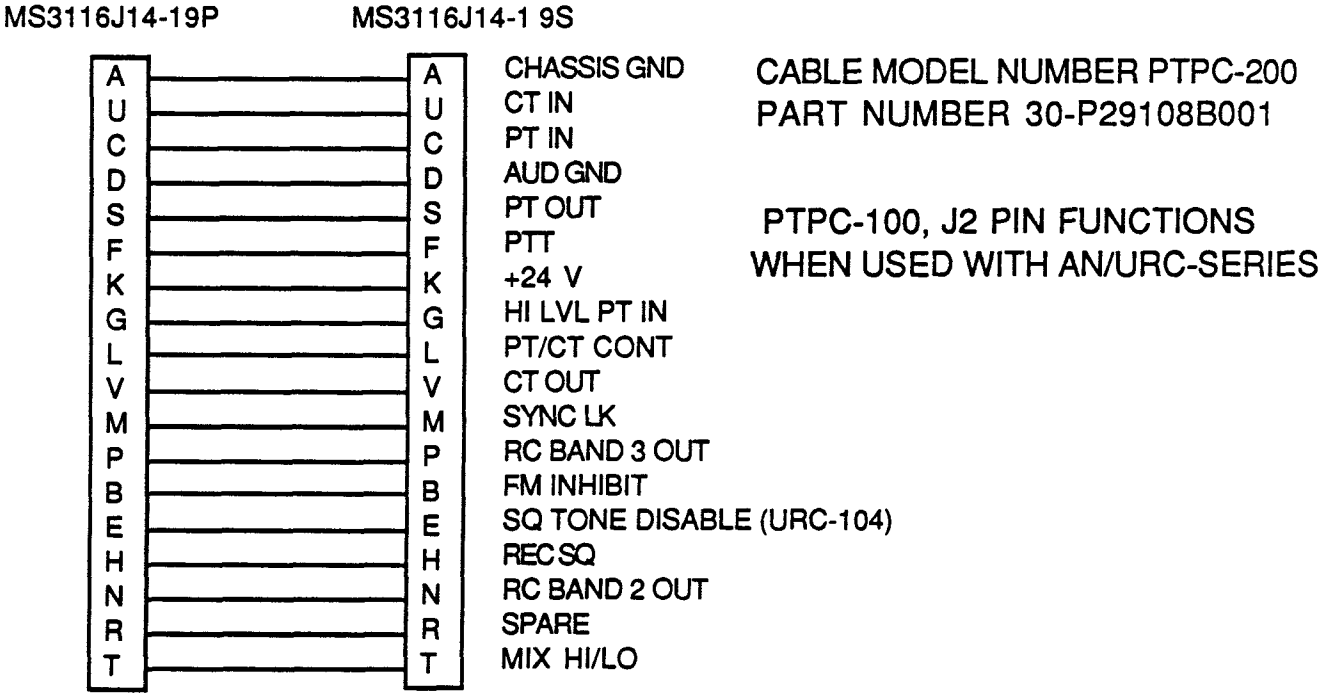


FIGURE 3-3 AN/URC- TO PTPE-100/101 INTERCONNECT CABLE DIAGRAM

In the above installation J2 on the Preamp Control Unit is a direct duplication of J2 (X-MODE) on the AN/URC- radio. Any equipment normally connected to J2 on the radio, COMSEC devices etc., may now be connected to J2 of the PTPC-1000 Preamp Control Unit. In this installation, the pin functions of J2 (PTPC-100) is as shown in figure 3-3.

3.2.2. LST-5A/B RADIO INSTALLATION

To install the Preamp System in an LST-5A/B system, connect the equipment as shown in figure 3-4, or 3-5 if an AM-7175 200 Watt Power Amp is part of the system. Figure 3-6 shows the interconnect diagram when an LST-5A/B is operated with a Remote Control Unit, and figures 3-7 and 3-8 show the interconnect cable diagrams.

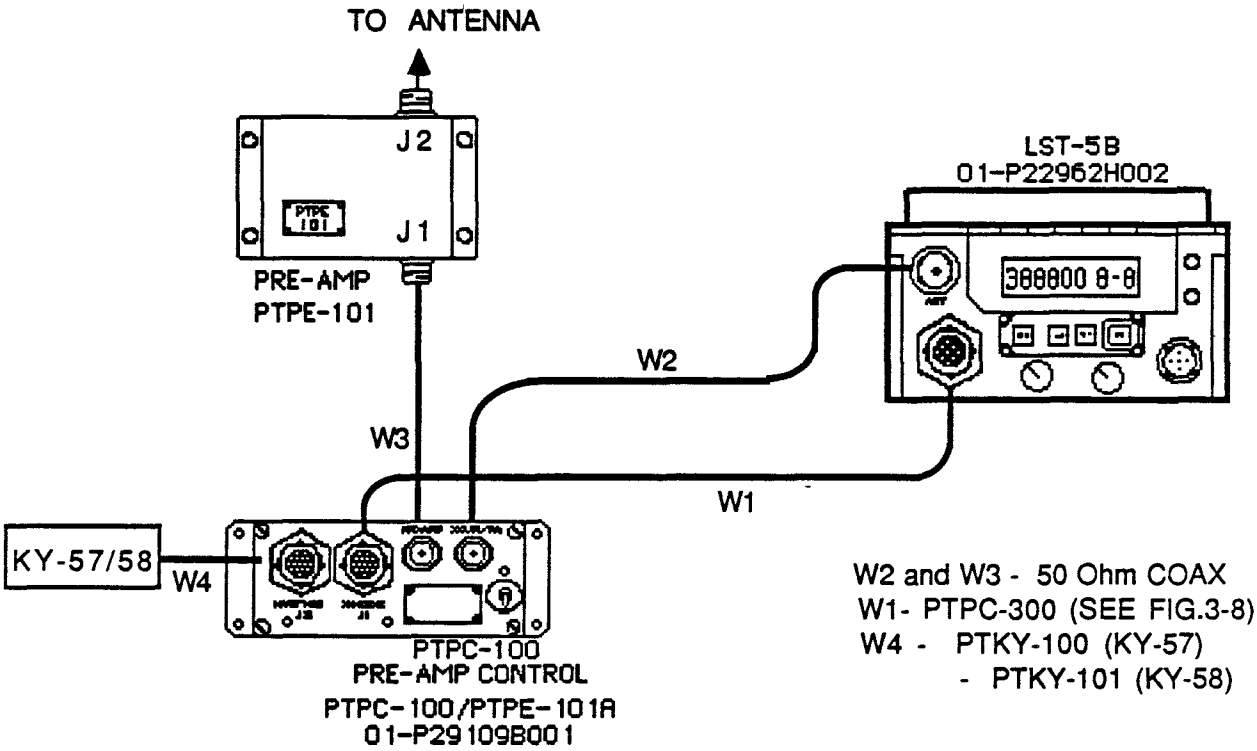


FIGURE 3-4: LST-5A/B TO PTPE-100/101 INSTALLATION

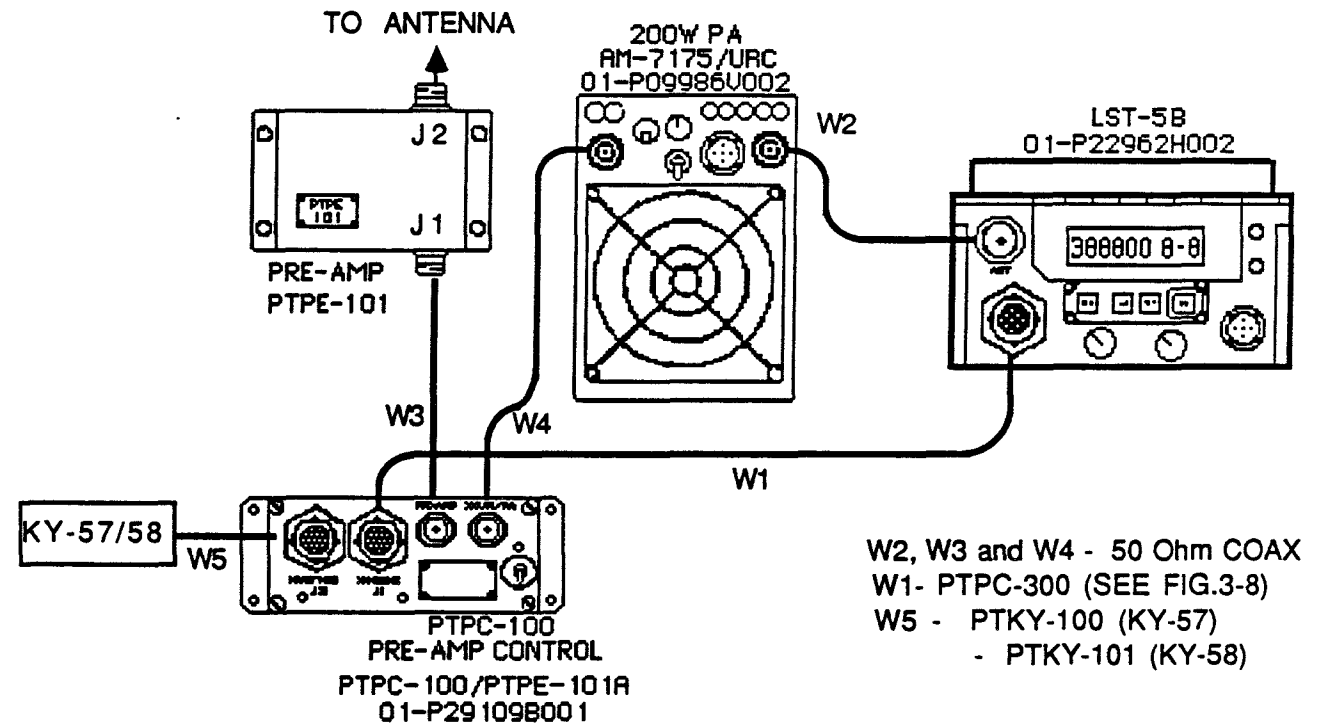


FIGURE 3-5: LST-5A/B / AM-7175 / PTPE-100/101 INSTALLATION

If the LST-5A/B is to operated with a Remote Control Unit, Junction box LSJU-100 is required to make all connections as shown in figure 3-6

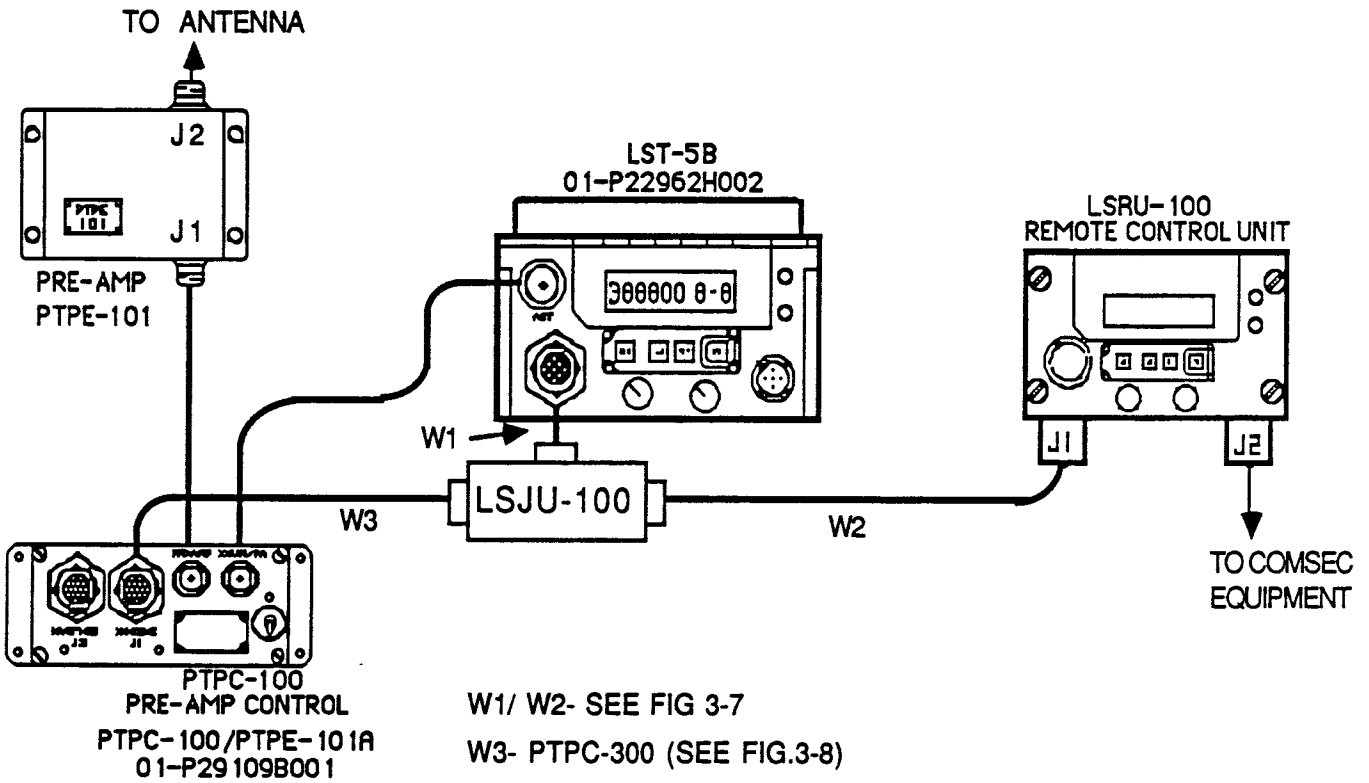


FIGURE 3-6: LST-5A/B TO PTPE-100/101 INSTALLATION

In the above installation, J2 on the Preamp Control Unit is not a direct duplication of J2 (X-MODE) on the LST-5A/B radio, the PTPC-100 connector has 19 pins while the radio's X-MODE connector has 26 pins Figure 3-9 shows the pin functions of J2 on the PTPC-100 in this installation. Peripheral equipment may still be connected to this connector but correct cabling will have to be determined. The remote controlled system is designed to have a COMSEC device (AN/CSZ-1, KY-57/58) connected to the Remote Control Unit.

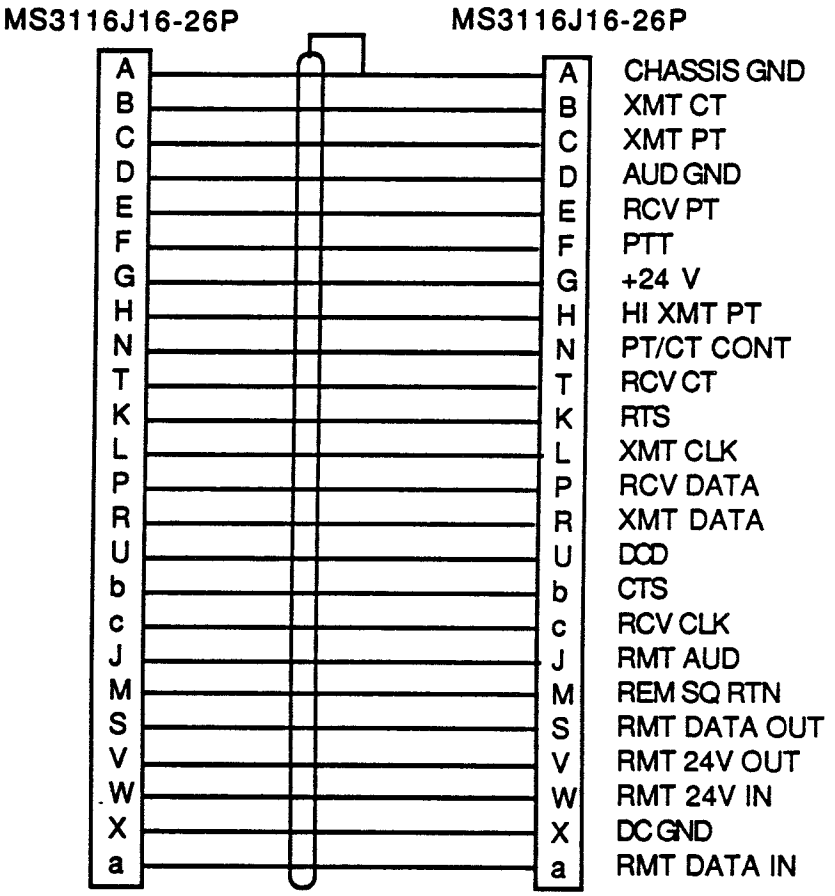


FIGURE 3-7: REMOTE LST-5A/B INTERCONNECT CABLES

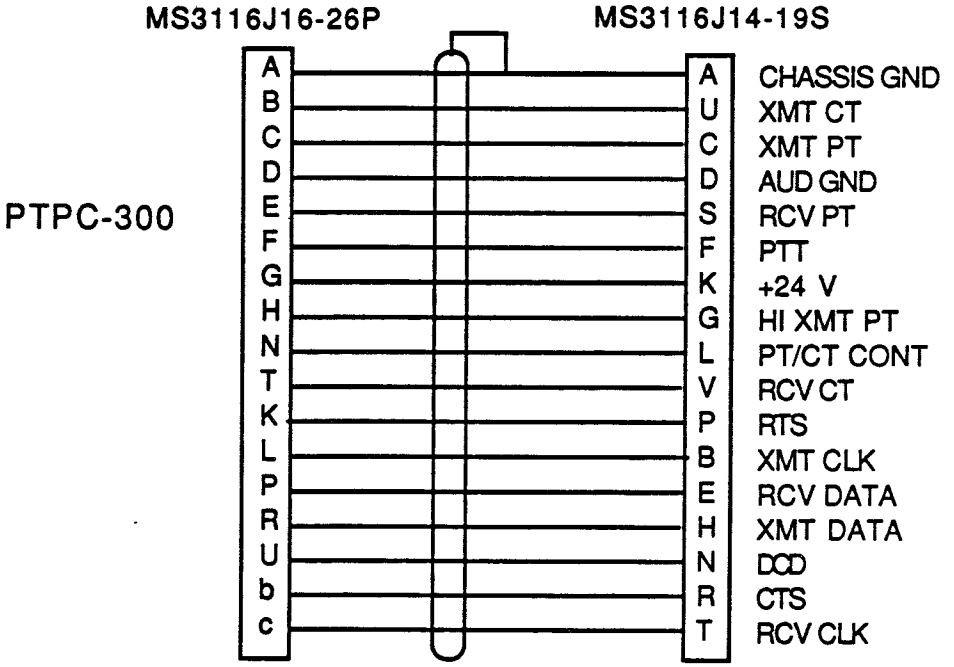


FIGURE 3-8: PTPC-300 INTERCONNECT CABLE

PIN FUNCTIONS OF PTPC-100, J2
WHEN USED WITH LST-5A/B .

A	CHASSIS GND
U	XMT CT
C	XMT PT
D	AUD GND
S	RCV PT
F	PTT
K	+24 V
G	HI XMT PT
L	PT/CT CONT
V	RCV CT
P	RTS
B	XMT CLK
E	RCV DATA
H	XMT DATA
N	DCD
R	CTS
T	RCV CLK

FIGURE 3-9: PTPC-100 J2 PIN FUNCTIONS IN LST-5A/B SYSTEM

SECTION 4

4. MAINTENANCE

4.1. GENERAL INFORMATION

This section contains all the documentation required to troubleshoot, repair and maintain the Preamp System. Included in this section are: circuit descriptions, schematic diagrams, parts lists and wiring diagrams. Also included is the fuse replacement procedure.

4.2. CIRCUIT DESCRIPTION

4.2.1. CONTROL UNIT

Refer to figure 4-1, the schematic diagram of the Preamp Control Unit, to follow this circuit description.

When the ON/OFF switch is turned ON, 28 Vdc appears at the emitter of Q1. In the receive mode the PTT line is high,turning Q2 on, this also turns on Q3 after capacitor C2 discharges through R7. This delay ensures that the transmitter is completely shutdown before the Preamp goes into the receive mode. When Q3 conducts, Q1 is turned on, providing 28 Vdc at its collector. This voltage goes through L3, F1, L2 and L1 onto the center conductor of the coax cable to the Preamp (PTPE-100/101). 28 Vdc on the coax places the Preamp in the receive mode and turns the Preamp on. If the PTT line is pulled low (transmit mode), Q2 stops conducting and Q3 and Q1 are turned off. This removes the 28 Vdc from the Preamp, placing it in the transmit mode. With the Preamp in the receive mode, 28 Vdc is present on the collector of Q1 and Q4 is turned on. This places a ground on the SYNTH. LOCK line to the radio, preventing it from transmitting until the 28 Vdc is removed from the collector of Q1 by pulling the PTT line low (transmit mode) or turning the Preamp OFF.

4.2.2. PREAMP UNIT

Refer to figure 4-2, the schematic diagram, for the following text.
The following major components are contained in the Preamp Unit:

1. RF Amplifier Z1
2. Voltage Regulator U1
3. Transmit bypass relays K1 and K2
4. Isolation reed relays A1K1 and A1K2
5. Low pass filter FL2
6. High pass filter FL1

When in the receive mode, +28 Vdc appears at J1 and is applied to Voltage regulator U1, which produces +12 Vdc to operate the RF amplifier Z1 and to energize reed relays A1K1 and A1K2. The +28 V also energizes relays K1 and K2, which directs any signal from the antenna to the input of Z1, via J2, FL1 and FL2. Relays A1K1 and A1K2 are closed at this time, so that the output of Z1 is passed through relay K1 to J1, and then via the coax cable to the Preamp Control Unit.

When the Preamp is turned OFF or when the radio is placed in the transmit mode, the 28 Vdc is removed from the coax cable and J1, causing all relays to de-energize. With K1 and K2 de-energized in the normally closed (NC) position, the RF path from J1 to J2 bypasses the Preamp.

4.3. MAINTENANCE

4.3.1. OPERATOR PREVENTIVE MAINTENANCE

Operator maintenance is limited to cleaning the exterior surface of the units.

1. Remove dust and loose dirt with a clean soft cloth.
2. Remove grease, fungus and ground-in dirt from the equipment by spraying with Freon F cleaning compound and wiping with a clean soft cloth. Male connectors should be wiped with the same compound. Female contacts should be cleaned by using a soft brush after spraying with the cleaning compound.

4.3.2. FUSE REPLACEMENT

Fuse F1 prevents major damage to the Preamp Control Unit, in case the 28 Vdc on the coax from J4 on the Control Unit is shorted. This condition occurs if the Preamp Unit is physically

bypassed with the 28 Vdc turned on. With J4 connected directly to an antenna, which presents a very low resistance, the excessive current will blow the fuse. Replacement of the fuse requires that the Preamp Control Unit be removed from its case by loosening four screws on the corners. The fuse is located between feedthrough capacitor C5 and E4 on the A1 board. A spare fuse is provided and is soldered to the cover of the RF shield. Remove the blown fuse by unsoldering its leads and replace with the spare fuse.

CONTROL | — | INITIAL RELEASE | 12-20-83 | N1658538 | DWG NO. PL01-P29105B001 | SH 1

*APPLICATION	
NEXT ASSY	USED ON
	PET ACC

ASTERISK INDICATES DATA WHICH IS NONMANDATORY -FOR INFORMATION ONLY

REVISIONS

REV	DESCRIPTION	DATE	APPROVED
A	REVISED PER MCO 85-5-1	85-4-23	D25256
B	SEE MCO D25291 M.C 85-6-14	85-6-7	[signature]

REV																			
SHEET																			
REV STATUS OF SHEETS		REV																	
		SHEET																	
REV																			
SHEET																			
REV STATUS OF SHEETS		REV	B	B															
		SHEET	1	2															

SEE SEPARATE WIRE LIST YES ☐ NO ☐

SEE SEPARATE PARTS LIST YES ☐ NO ☐

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS LISTED IN DOD-STD-100

UNLESS OTHERWISE SPECIFIED:		
ALL DIMENSIONS ARE IN INCHES. DWG IS END PROD.	DWN BY S. QUAN	12-12-83
	DOC CHK BY	
TOLERANCES:	DSGN CHK BY	
2 PLACE DEC ± .	MFG	
3 PLACE DEC ± .	PROJ NO. 3643	
HOLE DIA	CONTR NO.	
ANGLE ±	ISSUED	
	APVD Quanson K.	12-16-83
	APVD	

MOTOROLA INC.
Government Electronics Division
8201 E McDOWELL ROAD, P.O. BOX 1417, SCOTTSDALE, ARIZONA 85252

PRE-AMP AND CONTROL SYSTEM
PTPE-100 (225-400 MHz)

SIZE	FSCM NO.	DWG NO.
A	94990	PL01-P29105B001
SCALE		SHEET 1 of 2

'14 1-1975 DRAWING FORMAT-9/79

FIGURE 4-1
PTPE-100 SYSTEM

*46794-04

ITEM NO.	QTY U/M	CODE IDENT	DRAWING OR DOCUMENT NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	SUPPLEMENTARY PART/IDENT NO	NOTES
001	1.0000 EA			01-P29107B001	PTPC-100 ASSY		
002	1.0000 EA			01-P29106B001	PTPE-100 ASSY		
003	1.0000 EA		MIL-C-26482	MS3116F14-19P	CONNECTOR		
004	1.0000 EA		MIL-C-26482	MS3116F14-19S	CONNECTOR		
005	2.0000 EA	95770		EC-10	DUST COVER		
501	REF			12-P29191B	DESIGN SPEC		
502	REF			12-P29192B	TEST PROCEDURE		
503	REF			12-P29193B	DATA RECORD		
504	REF			66-P29194B	OPERATOR MANUAL		

CONTROL — | INITIAL RELEASE | 12-20-83 | N16585-5-8 | DWG NO. PL01-P29109B001

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A	REVISED PER MCO 84-12-3	84-11-21	N16877
B	REVISED PER MCO 85-5-6	85-4-23	D25259
C	SEE MCO D25290 M.C. 85-6-14	85-6-7	M. Hamm

REV																		
SHEET																		
REV STATUS OF SHEETS	REV																	
	SHEET																	
REV																		
SHEET																		
REV STATUS OF SHEETS	REV	C	C															
	SHEET	1	2															

SEE SEPARATE WIRE LIST YES ☐ NO ☐

SEE SEPARATE PARTS LIST YES ☐ NO ☐

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS LISTED IN DOD-STD-100

LESS OTHERWISE SPECIFIED:

ALL DIMENSIONS ARE IN INCHES. DWG IS END PROD.

TOLERANCES:

2 PLACE DEC ± .

3 PLACE DEC ± .

HOLE DIA

ANGLE ±

DWN BY	S. QUAN 12-12-83
DOC CHK BY	
DSGN CHK BY	
MFG	
PROJ NO.	3643
CONTR NO.	
ISSUED	
APVD	12-16-83
APVD	

MOTOROLA INC.
Government Electronics Group
8201 E. McDOWELL RD., P.O. BOX 1417, SCOTTSDALE, ARIZONA 85252

PRE-AMP AND CONTROL SYSTEM
PTPE-101 (225-270 MHz)

SIZE	FSCM NO.	DWG NO.
A	94990	PL01-P29109B001

SCALE | SHEET 1 of 2

Y14.1-1980 DRAWING FORMAT - 1/82

FIGURE 4-2
PTPE-101 SYSTEM

FIND NO.	QTY U/M	CODE IDENT	DRAWING OR DOCUMENT NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	SUPPLEMENTARY PART/IDENT NO	NOTES
001	1.0000 EA			01-P29107B001	PTPC-100 ASSY		
002	1.0000 EA			01-P29106B002	PTPL-101 ASSY		
003	1.0000 EA		MIL-C-26482	MS3116F14-19P	CONNECTOR		
004	1.0000 EA		MIL-C-26482	MS3116F14-19S	CONNECTOR		
005	2.0000 EA	95760		EC-10	DUST COVER		
901	REF			12-P29191B	DESIGN SPEC		
902	REF			12-P29192B	TEST PROCEDURE		
903	REF			12-P29193B	DATA RECORD		
904	REF			68-P29194B	OPERATOR MANUAL		

DWG NO. 63-P36061A	SH

REVISIONS

ZONE	REV	DESCRIPTION	DATE	APPROVED

PROJECT CONTROL	LTR	DESCRIPTION	DATE	APPROVED
	—	INITIAL RELEASE		

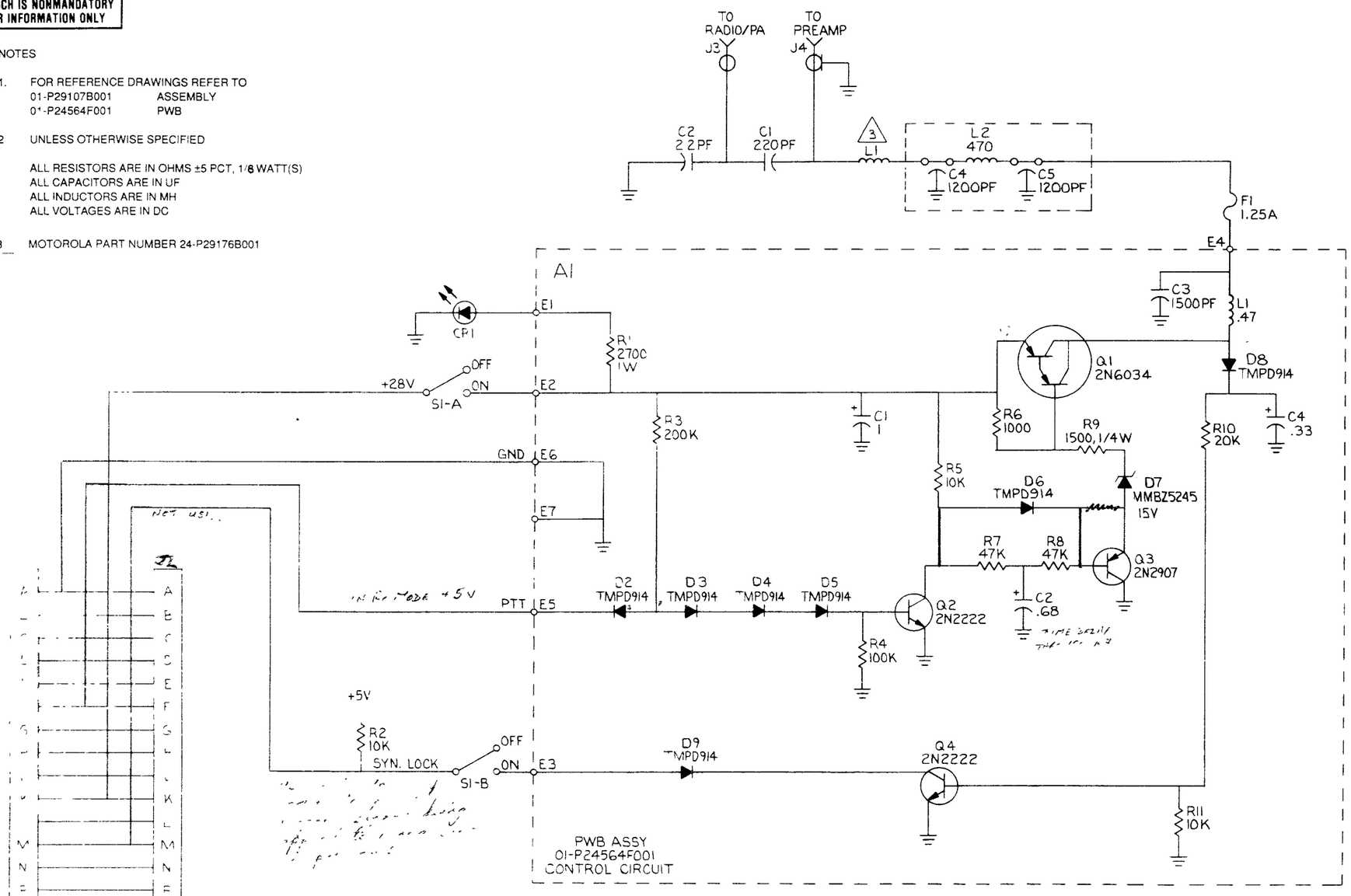
ASTERISK INDICATES DATA WHICH IS NONMANDATORY -FOR INFORMATION ONLY

NOTES

1. FOR REFERENCE DRAWINGS REFER TO
   01-P29107B001 ASSEMBLY
   01-P24564F001 PWB
2. UNLESS OTHERWISE SPECIFIED

   ALL RESISTORS ARE IN OHMS ±5 PCT, 1/8 WATT(S)
   ALL CAPACITORS ARE IN UF
   ALL INDUCTORS ARE IN MH
   ALL VOLTAGES ARE IN DC

△3 MOTOROLA PART NUMBER 24-P29176B001



SYM	SIZE	QTY
HOLE LIST		

MOTOROLA PART NUMBER	
01-P24564F	PTPC-100
01-P29017B	PET ACC
NEXT ASSY	USED ON
*APPLICATION	

UNLESS OTHERWISE SPECIFIED

ALL DIMENSIONS ARE IN INCHES
DRAWING IS END PRODUCT

TOLERANCES

2 PLACE DEC ± NA 3 PLACE DEC ± NA

HOLE DIA NA ANGLE ± NA

SHARP EDGES BROKEN NA MAX

DIM LIMITS APPLY NA BEFORE ☐ PLATING ☐ AFTER ☐ PAINTING ☐

PROJ NO 3716

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS LISTED IN DOD-STD-100

DWN BY T.TOMLINSON 87-11-11

DOC CHK BY

DSGN CHK BY

CONTR NO

ISSUED

QA APVD

MATL APVD

MFG APVD

ENGRG APVD

CUST APVD

SEE SEPARATE PARTS LIST YES ☐ NO ☒

SEE SEPARATE WIRE LIST YES ☐ NO ☒

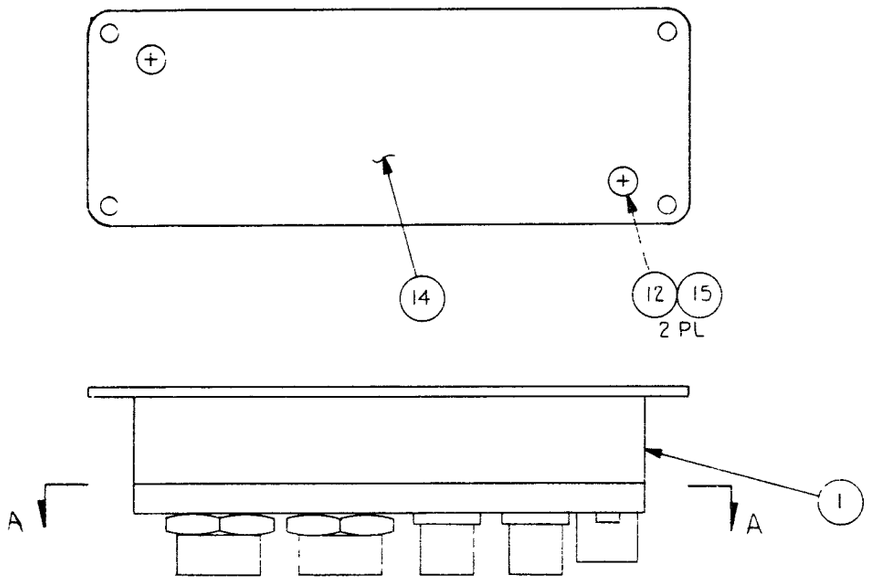
MOTOROLA INC.
Government Electronics Group
8201 E McDOWELL RD P O BOX 1417 SCOTTSDALE ARIZONA 85252

CONTROL CIRCUIT ASSY-PTPC-100 SCHEMATIC DIAGRAM

SIZE	FSCM NO	DWG NO
D	94990	63-P36061A

SCALE NONE

FIGURE 4-5
PTPC 100 SCHEMATIC



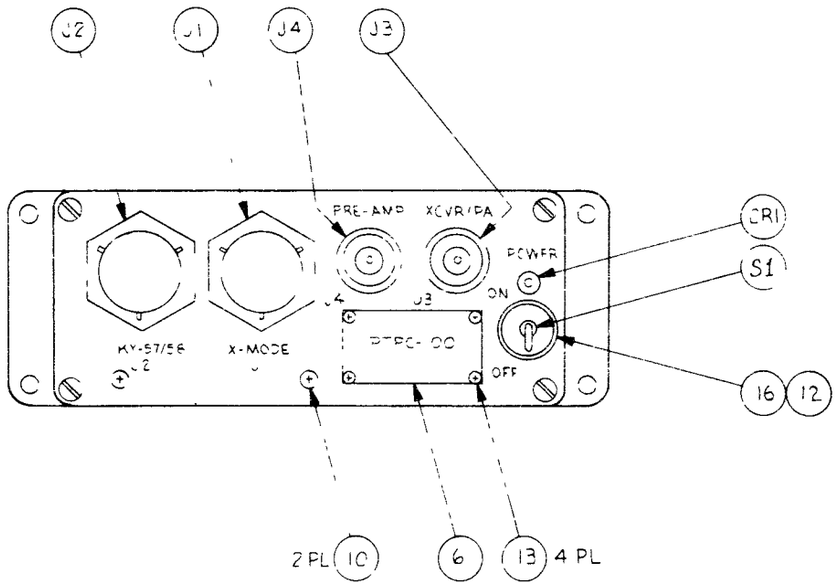
NOTE:

1. SOLDER ALL ELECTRICAL CONNECTIONS IN ACCORDANCE WITH REQUIREMENT 5 OF MIL-STD-454 USING FIND NUMBER 21.

2. COIL L1 SHALL BE STAKED ALONG ITS BOTTOM TO THE NUTS OF CONNECTORS J3 AND J4 AND BOTTOM OF FENCE FIND NUMBER 3 WITH ADHESIVE, 3145 RTV FIND NUMBER 22.

3. SPARE FUSE F2 SHALL BE SECURED BY SOLDERING ITS LEADS TO TOP OF COVER FIND NO.4 USING SOLDER FIND NO.21

4. A LENGTH OF WIRE, FIND NO. 19, APPROXIMATELY 2 INCH LONG, SHALL BE SOLDERED TO TERMINAL, FIND NO 23, AND TO FENCE, FIND NO. 3, FOR THE PURPOSE OF ELECTRICAL GROUNDING



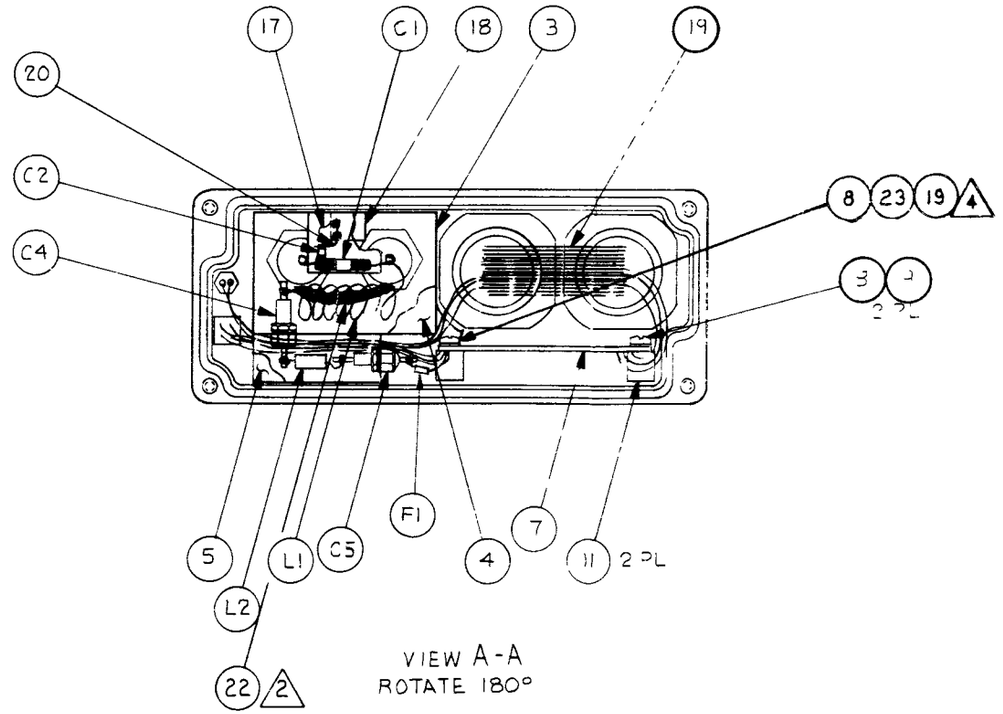


FIGURE 4-4
PTPC-100 ASSEMBLY

CONTROL	—	INITIAL RELEASE	12-20-83	N16585-58

DWG NO. PL01-P29107B001 SH 1

*APPLICATION	
NEXT ASSY	USED ON
01-P29109B001	
01-P29105B001	PET ACC

ASTERISK INDICATES DATA WHICH IS NONMANDATORY -FOR INFORMATION ONLY

REVISIONS

REV	DESCRIPTION	DATE	APPROVED
A	REVISED PER CO 84-6-21	84-5-17	N16768-2
B	REVISED PER MCO 85-1-15	84-12-20	D25209
C	REVISED PER MCO 85-5-1	85-4-23	D25263
D	SEE MCO D25289 M.C. 85-6-14	85-6-7	W. Stamm
E	SEE MCO J29913 GJM 86-10-27	86-11-06	S. Duncan
F	SEE MCO A33655 MPD 87-09-30	87-10-01	L. Martinez

REV																		
SHEET																		
REV STATUS OF SHEETS	REV																	
	SHEET																	
REV																		
SHEET																		
REV STATUS OF SHEETS	REV	F	F	F	F	F												
	SHEET	1	2	3	4	5												

SEE SEPARATE WIRE LIST YES ☐ NO ☐

SEE SEPARATE PARTS LIST YES ☐ NO ☐

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS LISTED IN DOD-STD-100

LESS OTHERWISE SPECIFIED:

ALL DIMENSIONS ARE IN NCHES. DWG IS END PROD.

TOLERANCES:

2 PLACE DEC ± .

3 PLACE DEC ± .

HOLE DIA

ANGLE ±

DWN BY	S. QUAN 12-12-83
DOC CHK BY	
DSGN CHK BY	
MFG	
PROJ NO.	3643
CONTR NO.	
ISSUED	
APVD	Mantonk. 12-16-83
APVD	J. Brown 12/16/83

MOTOROLA INC.
Government Electronics Group
8201 E. McDOWELL RD., P.O. BOX 1417, SCOTTSDALE, ARIZONA 85252

PTPC-100 ASSEMBLY

SIZE	FSCM NO.	DWG NO.
A	94990	PL01-P29107B001

SCALE | SHEET 1 of 5

404597 *

FIGURE 4-5
PTPC-100 PARTSLIST
Pg. 4-10

Y14.1-1980 DRAWING FORMAT - 1/82

PARTS LIST MOTOROLA INC. GEG CONTRACT NO. CODE IDENT 94990 PL 01-P29107B PN 01-P29107B001 REV LTR F SHEET 2

FIND NO.	QTY U/M	CODE IDENT	DRAWING OR DOCUMENT NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	SUPPLEMENTARY PART/IDENT NO	NOTES
001	1.0000 EA			15-P29169B001	COVER AND HOUSING		
003	1.0000 EA			26-P29170B001	FENCE		
004	1.0000 EA			26-P29171B001	COVER		
005	1.0000 EA			26-P29172B001	COVER		
006	1.0000 EA			33-P29200B001	NAMEPLATE		
007	1.0000 EA			01-P24564F001	CONTROL CKT ASSY		
008	2.0000 EA			03-14049B53	SCREW .112-40X.312		
009	1.0000 EA			MS15795-803	WASHER .125		
010	2.0000 EA			03-14052B53	SCREW .112-40X.312		
011	2.0000 EA			46-P29174B001	MTG BLOCK		
012	AR		MIL-S-46163		COMPOUND,THD LKG,BLUE TYPE II,GR N,#242	11-P99923A037	
013	4.0000 EA	45722		00X1/8	SCREW,DRIVE,STAINLESS TYPE U,SIZE 00		
014	1.0000 EA			64-P23685F001	PLATE,MTG		
015	2.0000 EA			MS24693-C270	SCREW .190-32X.375		
016	1.0000 EA			46-P23624F001	GUARD,SWITCH		
017	1.0000 EA			84-P23603F001	PWB		
018	1.0000 EA			07-P23602F001	BRACKET		

FIND NO.	QTY U/M	CODE IDENT	DRAWING OR DOCUMENT NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	SUPPLEMENTARY PART/IDENT NO	NOTES
019	AR		MIL-W-22759/11	M22759/11-22-9	WIRE #22 WHT		
020	AR		QQ-W-343		WIRE #22	30-15073A22	
021	AR		QQ-S-571	SN63WRMAP3	SOLDER		
022	AR	71984		RTV3145	ADHESIVE	11-29923E92	
023	1.0000 EA			MS35431-3	TERMINAL LUG		
024	2.0000 EA	95760		EC-14	DUST COVER		
025	2.0000 EA	95760		EC-10	DUST COVER		
901	REF EA			63-P36061A	SCHEMATIC DIAGRAM		
902	REF			12-P28742B	TEST PROCEDURE		
903	REF			12-P28743B	DATA RECORD		
904	REF			70-P23616F	OUTLINE DRAWING		
C 001	1.0000 EA			21-P16318A170	CAPACITOR 220PF-5-200	ATC100B221JP	
C 002	1.0000 EA	29990		ATC100B2R2DP500(X)	CAPACITOR 2.2PF-.5PF-500		
C 004	1.0000 EA		MIL-C-39014/16	M39014/16-0088	CAPACITOR 1200PF-20+80-500		
C 005	1.0000 EA		MIL-C-39014/16	M39014/16-0088	CAPACITOR 1200PF-20+80-500		

FIND NO.	QTY U/M	CODE IDENT	DRAWING OR DOCUMENT NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	SUPPLEMENTARY PART/IDENT NO	NOTES
CR001	1.0000 EA	05464		LL1903R	LED,RED		
F 001	1.0000 EA	75915		275002	FUSE,PICO 125V-2A		
F 002	1.0000 EA	75915		275002	FUSE,SPARE 125V-2A		
J 001	1.0000 EA			MS3114E14-19P	CONNECTOR		
J 002	1.0000 EA			MS3114E14-19S	CONNECTOR		
J 003	1.0000 EA	13511		82-811	CONNECTOR,TYPE N		
J 004	1.0000 EA	13511		82-811	CONNECTOR,TYPE N		
L 001	1.0000 EA			24-P29176B001	COIL,RF		
L 002	1.0000 EA			MS75083-9	COIL .47UH		

FIND NO.	QTY U/M	CODE IDENT	DRAWING OR DOCUMENT NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	SUPPLEMENTARY PART/IDENT NO	NOTES
S 001	1.0000 EA	95146		TTE23N-9T-1/4	TOGGLE SWITCH		

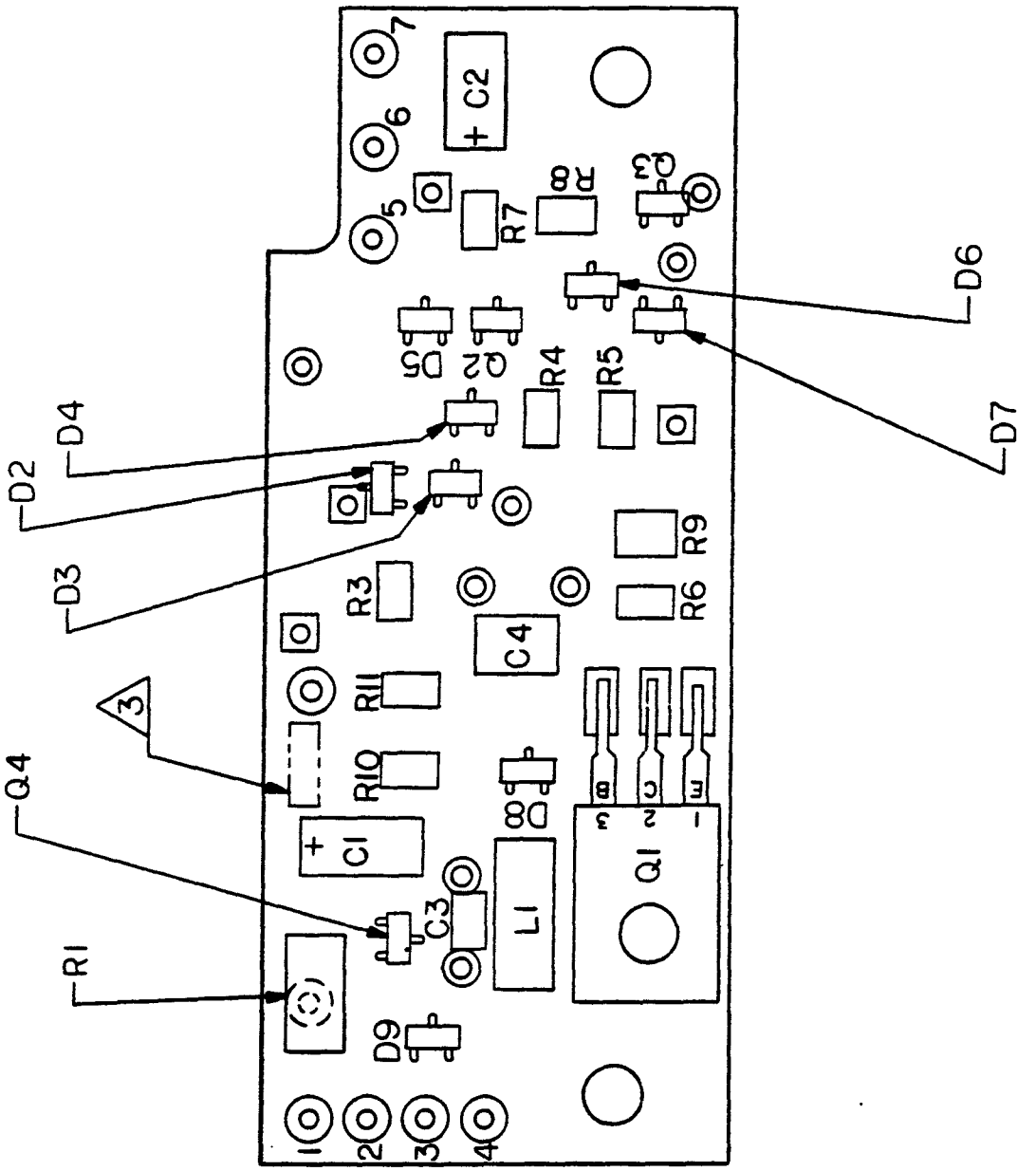


FIGURE 4-6
PTPC-100 PWB ASSY.

*APPLICATION	
NEXT ASSY	USED ON
01-P29107B	PET ACC

ASTERISK INDICATES DATA WHICH IS NONMANDATORY -FOR INFORMATION ONLY

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED

REV																		
SHEET																		
REV STATUS OF SHEETS	REV																	
	SHEET																	
REV																		
SHEET																		
REV STATUS OF SHEETS	REV	-	-	-	-													
	SHEET	1	2	3	4													

SEE SEPARATE WIRE LIST YES ☐ NO ☒

SEE SEPARATE PARTS LIST YES ☐ NO ☒

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS LISTED IN DOD-STD-100

OJ NO. 3716

LESS OTHERWISE SPECIFIED:

ALL DIMENSIONS ARE IN INCHES. DWG IS END PROD.

TOLERANCES:

2 PLACE DEC ± . NA

3 PLACE DEC ± . NA

HOLE DIA NA

ANGLE ± NA

DWN BY	R. Bettiga	87-07-27
DOC CHK BY	S.MARTINEZ	87-07-30
DSGN CHK BY		
CONTR NO.		
ISSUED		
QA APVD		
MATL APVD		
MFG APVD		
ENGRG APVD		7-30-87
CUST APVD		

MOTOROLA INC.
Government Electronics Group
8201 E. McDOWELL RD., P.O. BOX 1417, SCOTTSDALE, ARIZONA 85252

CIRCUIT CARD ASSEMBLY, CONTROL CIRCUIT

SIZE	FSCM NO.	DWG NO.
A	94990	PL01-P24564F

SCALE NA | WT | SHEET 1 of 4

Y14 1-1980 DRAWING FORMAT - 11/84

FIGURE 4-7
PTPC-100 PWB P/L.

FIND NO.	QTY U/M	CODE IDENT	DRAWING OR DOCUMENT NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	SUPPLEMENTARY PART/IDENT NO	NOTES
001	1.0000 EA			84-P24563F001	PRINTED WIRING BOARD		
002	AR		QQ-S-571	SN63WRMAP3	SOLDER		
003	AR		QQ-S-571	SN62WRMAP3	SOLDER		
004	AR		MIL-I-43553	B43553-IIBLKOZ	INK,BLACK		
C 001	1.0000 EA	56289		293D105X9050C2	CAPACITOR 1UF-10-50	M39003/01-2356	
C 002	1.0000 EA	56289		293D684X9050C2	CAPACITOR .68UF-10-50	M39003/01-2353	
C 003	1.0000 EA	56289		11C1206X7R152K050	CAPACITOR 1500PF-10-50	M39014/02-1322	
C 004	1.0000 EA	56289		11C1812Y5U334K050	CAPACITOR .33UF-10-50	M39014/02-1322	
D 002	1.0000 EA	56289		TMPD914	DIODE		
D 003	1.0000 EA	56289		TMPD914	DIODE		
D 004	1.0000 EA	56289		TMPD914	DIODE		
D 005	1.0000 EA	56289		TMPD914	DIODE		

FIND NO.	QTY U/M	CODE IDENT	DRAWING OR DOCUMENT NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	SUPPLEMENTARY PART/IDENT NO	NOTES
D 006	1.0000 EA	56289		TMPD914	DIODE		
D 007	1.0000 EA	04713		MMBZ5245	DIODE	JAN1N965A-1	
D 008	1.0000 EA	56289		TMPD914	DIODE		
D 009	1.0000 EA	56289		TMPD914	DIODE		
L 001	1.0000 EA	99800		1330-12	INDUCTOR .47UH		
Q 001	1.0000 EA	04713		2N6034	TRANSISTOR		
Q 002	1.0000 EA	04713		MMBT2222	TRANSISTOR		
Q 003	1.0000 EA	04713		MMBT2907A	TRANSISTOR		
Q 004	1.0000 EA	04713		MMBT2222	TRANSISTOR		
R 001	1.0000 EA	65940		MCR100272JW	RESISTOR 2.7K-5-1	RCR20G272JS	

FIND NO.	QTY U/M	CODE IDENT	DRAWING OR DOCUMENT NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	SUPPLEMENTARY PART/IDENT NO	NOTES
R 003	1.0000 EA	65940		MCR18204JW	RESISTOR 200K-5-1/8		
R 004	1.0000 EA	65940		MCR18104JW	RESISTOR 100K-5-1/8		
R 005	1.0000 EA	65940		MCR18103JW	RESISTOR 10K-5-1/8		
R 006	1.0000 EA	65940		MCR18102JW	RESISTOR 1000-5-1/8		
R 007	1.0000 EA	65940		MCR18473JW	RESISTOR 47K-5-1/8		
R 008	1.0000 EA	65940		MCR18473JW	RESISTOR 47K-5-1/8		
R 009	1.0000 EA	65940		MCR25152JW	RESISTOR 1.5K-5-1/4		
R 010	1.0000 EA	65940		MCR18203JW	RESISTOR 20K-5-1/8		
R 011	1.0000 EA	65940		MCR18103JW	RESISTOR 10K-5-1/8		

28 V or Cntrl conductor in Rx mode

Shown in Tx Mode

TO CONTROL BOX

J1

C1 220

K1 NC

NC K2

NO

NO

J2 TO ANTENNA

L1

C2 1200

A1

CR1 IN4003

L1 470

C1 1500

L2 470

U1 MC7812K VOLT REGULATOR

C2 .33μF

C3 .33μF

CR2 IN4003

K1 — C1 30MHz A1 — K2

OUT Z1 AM143 IN

Vcc

GND

J1 225 MHz FL1 HIGH PASS

J2

J3 400 MHz IN PTPE 100 450 MHz IN PTPE 101

FL2 LOW PASS

J4

NOTES:

1. FOR REFERENCE DRAWINGS REFER TO:

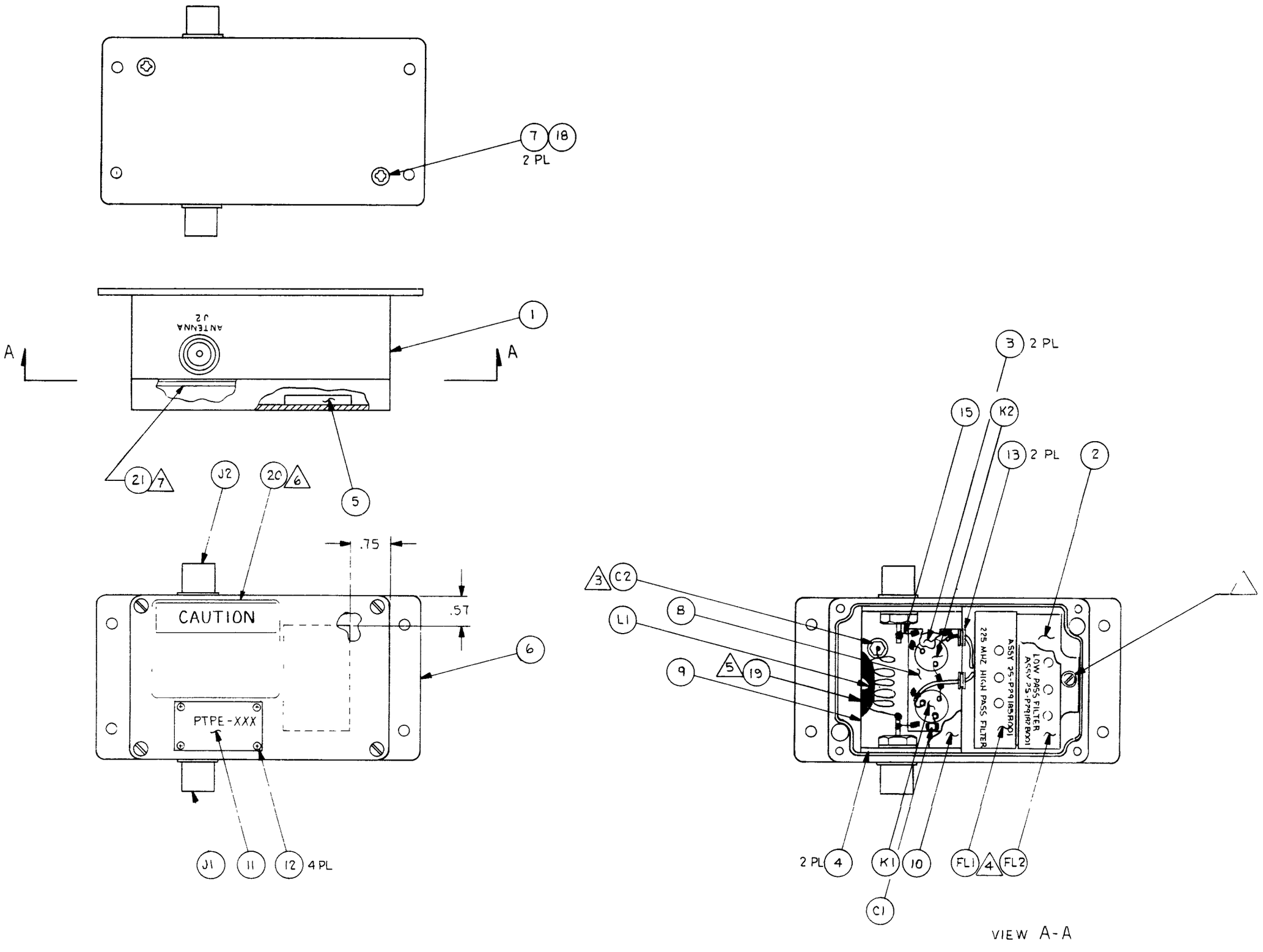
	01-P29106B001	01-P29106B002	ASSY DWG
A1	01-P29178B001	01-P+9178B001	PWB ASSY
FL1	25-P29187B001	25-P29187B001	HP FILTER ASSEMBLY
FL1	63-P23680F	63-P23680F	HP FILTER SCHEMATIC
FL2	25-P29185B001	25-P29185B002	LP FILTER ASSEMBLY
FL2	63-P23681	63-P23682	LP FILTER SCHEMATIC

2. UNLESS OTHERWISE SPECIFIED

ALL RESISTORS ARE IN OHMS ± 5 PCT, 1/4 WATT(S).
ALL CAPACITORS ARE IN UF.
ALL INDUCTORS ARE IN MH.
ALL VOLTAGES ARE IN DC.

PKE-AMP

FIGURE 4-8
PTPE-100/101 SCHEMATIC



VIEW A-A

FIGURE 4-9

PTPE-100/101 ASSEMBLY

CONTROL — INITIAL RELEASE 12-20-83 N16575 — DWG NO. PL01-P29106B001 SH. 1

*APPLICATION	
NEXT ASSY	USED ON
01-P29105B001	PET ACC

ASTERISK INDICATES DATA WHICH IS NONMANDATORY -FOR INFORMATION ONLY

REVISIONS

REV	DESCRIPTION	DATE	APPROVED
A	REVISED PER MCO 84-6-14	84-5-17	N16768
B	REVISED PER MCO 85-5-1	85-4-23	D25257
C	SEE MCO D25320 85-9-11	85-9-18	M. Stamm
D	SEE MCO J29765 86-1-24	86-1-31	M. Stamm
E	SEE MCO A33626 JMM 87-07-06	87-07-07	AJ Ferguson

REV																		
SHEET																		
REV STATUS OF SHEETS	REV																	
	SHEET																	
REV																		
SHEET																		
REV STATUS OF SHEETS	REV	E	E	E	E													
	SHEET	1	2	3	4													

SEE SEPARATE WIRE LIST YES ☐ NO ☐

SEE SEPARATE PARTS LIST YES ☐ NO ☐

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS LISTED IN DOD-STD-100

UNLESS OTHERWISE SPECIFIED:

ALL DIMENSIONS ARE IN INCHES. DWG IS END PROD.

TOLERANCES:

2 PLACE DEC ± .

3 PLACE DEC ± .

HOLE DIA

ANGLE ±

DWN BY	S. QUAN 12-12-83
DOC CHK BY	
DSGN CHK BY	
MFG	
PROJ NO.	3643
CONTR NO.	
ISSUED	
APVD	Quanton K. 12-16-83
APVD	[signature] 12/16/83

MOTOROLA INC.
Government Electronics Division
8201 E. McDOWELL ROAD. P.O. BOX 1417. SCOTTSDALE. ARIZONA 85252

PTPE-100 ASSEMBLY

SIZE	FSCM NO.	DWG NO.
A	94990	PL01-P29106B001

SCALE | SHEET 1 of 4

ANSI Y14.1-1975 DRAWING FORMAT-9/79

FIGURE 4-10 PTPE-100 PARTS LIST

FIND NO.	QTY U/M	CODE IDENT	DRAWING OR DOCUMENT NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	SUPPLEMENTARY PART/IDENT NO	NOTES
001	1.0000 EA			15-P29177B001	HOUSING AND COVER		
002	1.0000 EA			01-P29178B001	PWB ASSY		
003	2.0000 EA			43-P23623F001	SPACER,RELAY		
004	2.0000 EA			64-P23604F001	PLATE		
005	1.0000 EA			75-P23605F001	PAD		
006	1.0000 EA			64-P23686F001	PLATE,MOUNTING		
007	2.0000 EA			MS24693-C270	SCREW .190-32X.375		
008	1.0000 EA			04-P23662F001	PWB,RELAY		
009	1.0000 EA			26-P24579F001	SHIELD,RELAY		
010	1.0000 EA			26-P24580F001	SHILLD,RELAY,COVER		
011	1.0000 EA			33-P29196B001	NAMEPLATE		
012	4.0000 EA	45722		00X1/8	SCREW,DRIVE,STAINLESS TYPE U,SIZE 00		
013	2.0000 EA			MS35489-1	GRUMMET NEO .13		
015	AR		QQ-W-343		WIRE #22	30-15073A22	
016	AR		QQ-S-571	SN63WRMAP3	SOLDER		
017	AR		QQ-S-571	SN96WRMAP3	SOLDER		
018	AR		MIL-S-46163		COMPOUND,THD LKG,BLUE TYPE II,GR N,#242	11-P9992SA037	

FIND NO.	QTY U/M	CODE IDENT	DRAWING OR DOCUMENT NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	SUPPLEMENTARY PART/IDENT NO	NOTES
019	AR	71984		RTV3145	ADHESIVE	11-29923E92	
020	1.0000 EA			33-P24408F001	LABEL,CAUTION		
021	1.0000 EA			32-P24411F001	O-RING		
022	1.0000 EA	79963		7A-225	TERMINAL,LUG		
901	REF			63-P29197B	SCHEMATIC DIAGRAM		
902	REF			12-P29198B	TEST PROCEDURE		
903	REF			12-P29199B	DATA RECORD		
904	REF			70-P23617F	OUTLINE DRAWING		
C 001	1.0000 EA			21-P16318A170	CAPACITOR 220PF-5-200		
C 002	1.0000 EA		MIL-C-39014/16	M39014/16-0088	CAPACITOR 1200PF-20+80-500		
FL001	1.0000 EA			25-P29187B001	FILTER,HIGH PASS		
FL002	1.0000 EA			25-P29182B001	FILTER,LOW PASS		

PARTS LIST MOTOROLA INC. GEG CONTRACT NO. CODE IDENT 94990 PL 01-P29106B PN 01-P29106B001 REV LTR E SHEET 4

FIND NO.	QTY U/M	CODE IDENT	DRAWING OR DOCUMENT NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	SUPPLEMENTARY PART/IDENT NO	NOTES
J 001	1.0000 EA	13511		82-611	CONNECTOR, TYPE N		
J 002	1.0000 EA	13511		82-611	CONNECTOR, TYPE N		
K 001	1.0000 EA	18741		HC-1	RELAY, VACUUM		
K 002	1.0000 EA	18741		HC-1	RELAY, VACUUM		
L 001	1.0000 EA			24-P291768001	COIL, RF		

CONTROL — INITIAL RELEASE 12-20-83 N16585-5 &

DWG NO. PL01-P29106B002 SH

APPLICATION	
NEXT ASSY	USED ON
01-P29109B001	PET ACC

ASTERISK INDICATES DATA WHICH IS NONMANDATORY -FOR INFORMATION ONLY

REVISIONS

REV	DESCRIPTION	DATE	APPROVED
A	REVISED PER CO 84-6-14	84-5-17	N16768-3
B	REVISED PER MCO 85-5-1	85-4-23	D25258
C	SEE MCO D25320 85-9-11	85-9-18	M. Stamm
D	SEE MCO J29765 86-1-24	86-1-31	M. Stamm
E	SEE MCO A33626 JMM 87-07-06	87-07-07	[illegible]

REV																		
SHEET																		
REV STATUS OF SHEETS	REV																	
	SHEET																	
REV																		
SHEET																		
REV STATUS OF SHEETS	REV	E	E	E	E													
	SHEET	1	2	3	4													

SEE SEPARATE WIRE LIST YES ☐ NO ☐

SEE SEPARATE PARTS LIST YES ☐ NO ☐

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS LISTED IN DOD-STD-100

ESS OTHERWISE SPECIFIED:
ALL DIMENSIONS ARE IN CHES. DWG IS END PROD.

TOLERANCES:

PLACE DEC ± .
PLACE DEC ± .
HOLE DIA
ANGLE ±

DWN BY	S. QUAN	12-12-83
DOC CHK BY		
DSGN CHK BY		
MFG		
PROJ NO.	3643	
CONTR NO.		
ISSUED		
APVD	[signature]	12-16-83
APVD	[signature]	12/16/83

MOTOROLA INC.
Government Electronics Division
8201 E McDOWELL ROAD. P.O. BOX 1417. SCOTTSDALE. ARIZONA 85252

PTPE-101 ASSEMBLY

SIZE	FSCM NO.	DWG NO.
A	94990	PL01-P29106B002

SCALE | SHEET 1 of 4

1.1-1975 DRAWING FORMAT-9/79

FIGURE 4-11
PTPE-101 PARTS LIST

*6548-cy

PARTS LIST MOTOROLA INC. GEG CONTRACT NO. CODE IDENT 94990 PL 01-P29106B PN 01-P29106B002 REV LTR E SHEET 2

FIND NO.	QTY U/M	CODE IDENT	DRAWING OR DOCUMENT NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	SUPPLEMENTARY PART/IDENT NO	NOTES
001	1.0000 EA			15-P29177B001	HOUSING AND COVER		
002	1.0000 EA			01-P29178B001	PWB ASSY		
003	2.0000 EA			43-P23623F001	SPACER,RELAY		
004	2.0000 EA			64-P23604F001	PLATE		
005	1.0000 EA			75-P23605F001	PAD		
006	1.0000 EA			64-P23686F001	PLATE,MOUNTING		
007	2.0000 EA			MS24693-C270	SCREW .190-32X.375		
008	1.0000 EA			84-P23662F001	PWB,RELAY		
009	1.0000 EA			26-P24579F001	SHIELD,RELAY		
010	1.0000 EA			26-P24580F001	SHIELD,RELAY,COVER		
011	1.0000 EA			33-P23643B001	NAME PLATE		
012	4.0000 EA	45722		00X1/8	SCREW,DRIVE,STAINLESS TYPE U,SIZE 00		
013	2.0000 EA			MS35469-1	GROMMET		
015	AR		QQ-W-343		WIRE #22	30-15073A22	
016	AR		QQ-S-571	SN63WRMAP3	SOLDER		
017	AR		QQ-S-571	SN96WRMAP3	SOLDER		
018	AR EA		MIL-S-46163		COMPOUND,THD LKG,BLUE TYPE II,GR N,#242	11-P99923A037	

FIND NO.	QTY U/M	CODE IDENT	DRAWING OR DOCUMENT NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	SUPPLEMENTARY PART/IDENT NO	NOTES
019	AR	71984		RTV3145	ADHESIVE	11-29923E92	
020	1.0000 EA			33-P24408F001	LABEL,CAUTION		
021	1.0000 EA			32-P24411F001	O-RING		
022	1.0000 EA	79963		7A-225	TERMINAL,LUG		
901	REF			63-P29197B	SCHEMATIC DIAGRAM		
902	REF			12-P29198B	TEST PROCEDURE		
903	REF			12-P29199B	DATA RECORD		
904	REF			70-P23617F	OUTLINE DRAWING		
C 001	1.0000 EA			21-P16318A170	CAPACITOR 220PF-5-200		
C 002	1.0000 EA		MIL-C-39014/16	M39014/16-0086	CAPACITOR 1200PF-20+80-500		
FL001	1.0000 EA			25-P291876001	FILTER,HIGH PASS		
FL002	1.0000 EA			25-P291828002	FILTER,LOW PASS		

FIND NO.	QTY U/M	CODE IDENT	DRAWING OR DOCUMENT NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	SUPPLEMENTARY PART/IDENT NO	NOTES
J 001	1.0000 EA	13511		82-811	CONNECTOR, TYPE N		
J 002	1.0000 EA	13511		82-811	CONNECTOR, TYPE N		
K 001	1.0000 EA	18741		HC-1	RELAY, VACUUM		
K 002	1.0000 EA	18741		HC-1	RELAY, VACUUM		
L 001	1.0000 EA			24-P29176B001	COIL, RF		

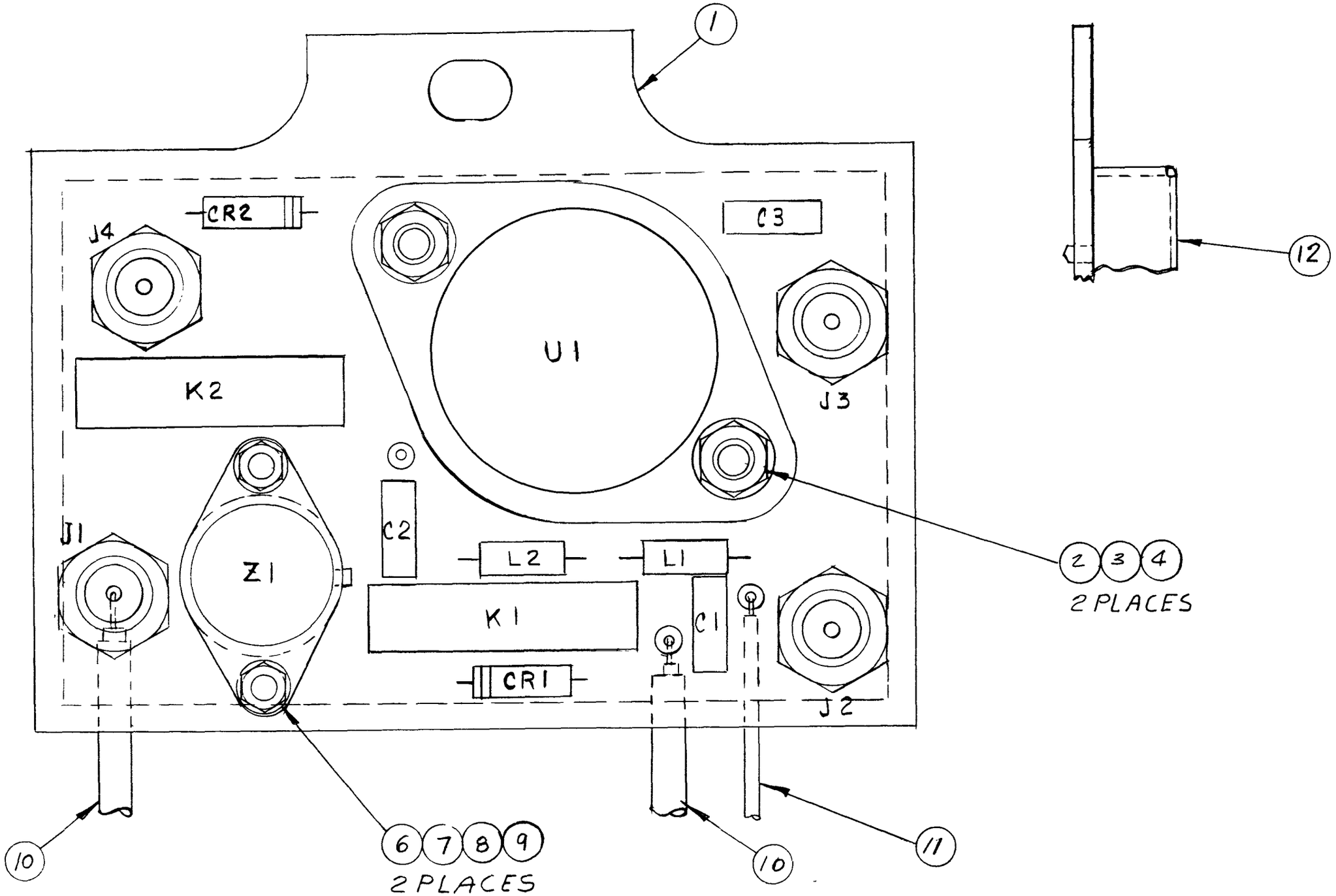


FIGURE 4-12
PTPE-100/101 PWB ASSY.

CONTROL — INITIAL RELEASE 12-20-83 IV16585358

DWG NO. PL01-P29178B001

*APPLICATION	
NEXT ASSY	USED ON
01-P29106B002	
01-P29106B001	PET ACC

ASTERISK INDICATES DATA WHICH IS NONMANDATORY -FOR INFORMATION ONLY

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	SEE MCO D25269 85-6-11	85-5-16	M. Stamm
B	SEE MCO J29995 MPD 87-04-16	87-04-28	B Ferguson
C	SEE MCO A33630 MPD 87-07-17	87-07-20	B Ferguson

REV																		
SHEET																		
REV STATUS OF SHEETS	REV																	
	SHEET																	
REV																		
SHEET																		
REV STATUS OF SHEETS	REV	C	C	C	C													
	SHEET	1	2	3	4													

SEE SEPARATE WIRE LIST YES ☐ NO ☐

SEE SEPARATE PARTS LIST YES ☐ NO ☐

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS LISTED IN DOD-STD-100

UNLESS OTHERWISE SPECIFIED:

ALL DIMENSIONS ARE IN INCHES. DWG IS END PROD.

TOLERANCES:

2 PLACE DEC ± .

3 PLACE DEC ± .

HOLE DIA

ANGLE ±

DWN BY S. QUAN 12-12-83

DOC CHK BY

DSGN CHK BY

MFG

PROJ NO. 3643

CONTR NO.

ISSUED

APVD Quandon K. 12-16-83

APVD N E Brown 12/16/83

MOTOROLA INC.

Government Electronics Group

8201 E. McDOWELL RD., P.O. BOX 1417, SCOTTSDALE, ARIZONA 85252

PWB ASSY, PTPE-100/101

SIZE	FSCM NO.	DWG NO.
A	94990	PL01-P29178B001

SCALE

SHEET 1 of 4

Y14.1-1980 DRAWING FORMAT - 1/82

FIGURE 4-13 PTPE-100/101 PWB P/L.

FIND NO.	QTY U/M	CODE IDENT	DRAWING OR DOCUMENT NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	SUPPLEMENTARY PART/IDENT NO	NOTES
001	1.0000 EA			34-P29179B001	PWB		
002	2.0000 EA			03-14049B33	SCREW 112-40X.312		
003	2.0000 EA			NAS671C4	NUT 1120-40		
004	2.0000 EA			NAS620C4L	WASHER 112		
005	2.0000 EA			05-15013620	SCREW 060-60X.187		
007	2.0000 EA			NAS671C0	NUT 0600-8C		
008	2.0000 EA			NAS1676C0	WASHER 060		
009	2.0000 EA			NAS620C0	WASHER 060		
010	AR		MIL-C-17/93	M17/93-RG178	CABLE		
011	AR		MIL-W-22759/11	M22759/11-22-9	WIRE #22 WHT		
012	1.0000 EA			26-P29180B001	SHIELD		
013	AR			11-P14157A01	INK,BLACK EPOXY AIR DRIED		
C 001	1.0000 EA		MIL-C-39014/2	M39014/02-1322	CAPACITOR 1000PF-10-200		
C 002	1.0000 EA		MIL-C-39014/2	M39014/02-1356	CAPACITOR .33UF-10-50		
C 003	1.0000 EA		MIL-C-39014/2	M39014/02-1356	CAPACITOR .33UF-10-50		

FIND NO.	QTY U/M	CODE IDENT	DRAWING OR DOCUMENT NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	SUPPLEMENTARY PART/IDENT NO	NOTES
CR001	1.0000 EA			1N4003	DIODE		
CR002	1.0000 EA			1N4003	DIODE		
J 001	1.0000 EA	98291		52-052-0000	CONNECTOR		
J 002	1.0000 EA	98291		52-052-0000	CONNECTOR		
J 003	1.0000 EA	98291		52-052-0000	CONNECTOR		
J 004	1.0000 EA	98291		52-052-0000	CONNECTOR		
K 001	1.0000 EA	71707		CR-2204-12-22	RELAY		
K 002	1.0000 EA	71707		CR-2204-12-22	RELAY		

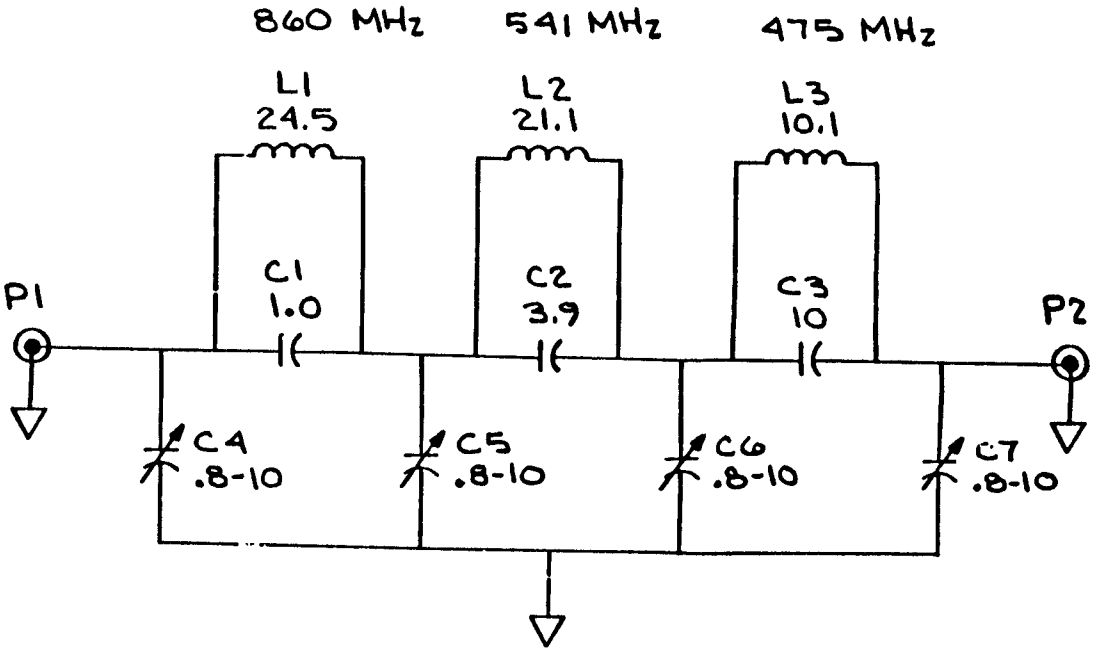
FIND NO.	QTY U/M	CODE IDENT	DRAWING OR DOCUMENT NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	SUPPLEMENTARY PART/IDENT NO	NOTES
L 001	1.0000 EA			MS75083-9	COIL 47UH		
L 002	1.0000 EA			MS75083-9	COIL 47UH		
U 001	1.0000 EA	04713		MC7812K	VOLTAGE REGULATOR 12V		
Z 001	1.0000 EA	21912		AM-145	AMPLIFIER		

NOTES:

1. FOR REFERENCE DRAWINGS REFER TO 01-P29182B001 ASSEMBLY.

2. UNLESS OTHERWISE SPECIFIED

   ALL RESISTORS ARE IN OHMS ± 5 PCT, 1/4 WATT(S).
   ALL CAPACITORS ARE IN UF.
   ALL INDUCTORS ARE IN MH.
   ALL VOLTAGES ARE IN DC.



MOTOROLA PART NUMBER			
NEXT ASSY	USED ON	PET. ACC.	
01-P29182B001			
*APPLICATION			

UNLESS OTHERWISE SPECIFIED:
ALL DIMENSIONS ARE IN INCHES.
DRAWING IS END PRODUCT.
TOLERANCES:
2 PLACE DEC ±. 3 PLACE DEC ±.
HOLE DIA ANGLE ±
SHARP EDGES BROKEN MAX
DIM LIMITS APPLY: AFTER ☐ BEFORE ☐ PLATING ☐ PAINTING ☐

SEE SEPARATE PARTS LIST YES ☐ NO ☒
INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS LISTED IN DOD-STD-100.
DWN BY K. Frock 9-13-93
DOC CHK BY
DSGN CHK BY
MFG
PROJ NO. 3643
CONTR NO.
ISSUED
APVD
APVD

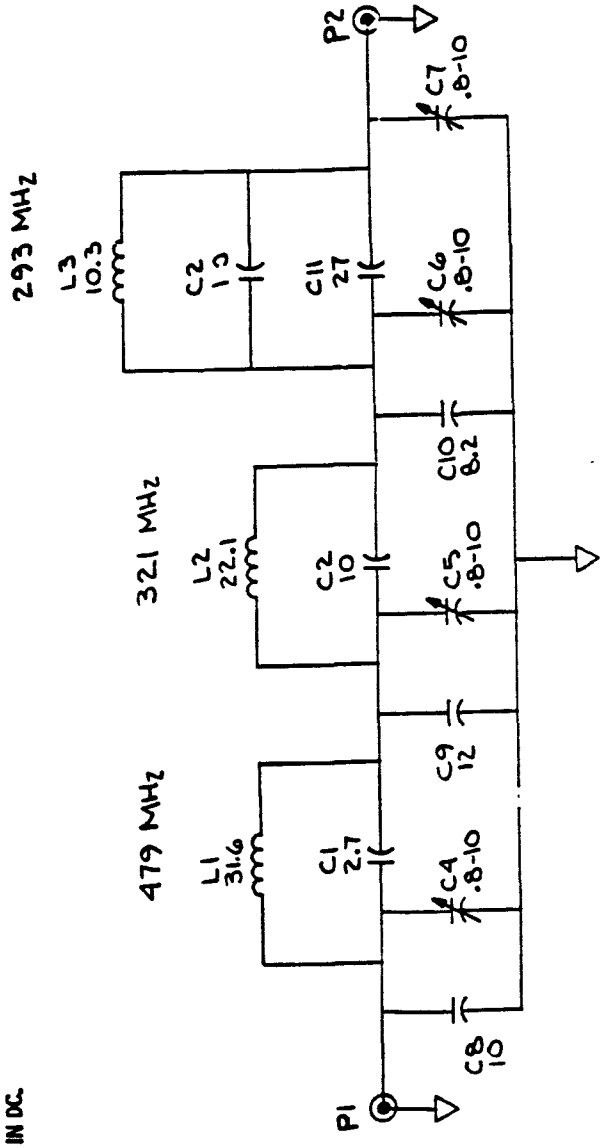
SEE SEPARATE WIRE LIST YES ☐ NO ☒

MOTOROLA INC.
Government Electronics Group
8201 E. McDOWELL RD., P.O. BOX 1417, SCOTTSDALE, ARIZONA 85252

400 MHz
LOW-PASS FILTER

SIZE FSCM NO. DWG NO.

FIGURE 4-14
400M LP FILTER SCHEMATIC



NOTES:

1. FOR REFERENCE DRAWINGS REFER TO 01-P29182 8002 ASSEMBLY.
2. UNLESS OTHERWISE SPECIFIED
   ALL RESISTORS ARE IN OHMS ± 5 PCT, 1/4 WATTS).
   ALL CAPACITORS ARE IN UF.
   ALL INDUCTORS ARE IN MH.
   ALL VOLTAGES ARE IN DC.

MOTOROLA PART NUMBER	
01-P29182 8002	PET ACC
NEXT ASSY	USED ON
*APPLICATION	

UNLESS OTHERWISE SPECIFIED:
ALL DIMENSIONS ARE IN INCHES.
DRAWING IS END PRODUCT.
TOLERANCES:
2 PLACE DEC ±. 3 PLACE DEC ±.
HOLE DIA ANGLE ±
SHARP EDGES BROKEN MAX
DIM LIMITS APPLY: BEFORE ☐ PLATING ☐ AFTER ☐ PAINTING ☐

SEE SEPARATE PARTS LIST YES ☐ NO ☒ | SEE SEPARATE WIRE LIST YES ☐ NO ☒
INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS LISTED IN 000-STD-100.

DWN BY K. Frock 9-13-83	MOTOROLA INC. Government Electronics Group 8201 E. McDowell Rd., P.O. Box 1417 Scottsdale, Arizona 85252
DOC CHK BY	
DSGN CHK BY	
MFG	270 MHz LOW-PASS FILTER
PROJ NO. 3643	
CONTR NO.	
ISSUED	
APVD K.	
APVD	

FIGURE 4-15
270M LP FILTER. SCHEMATIC

NOTES:

1. FOR REFERENCE : C8, C9, C10 AND C11 ARE FOR -002 ASSEMBLY ONLY (270 MHz).

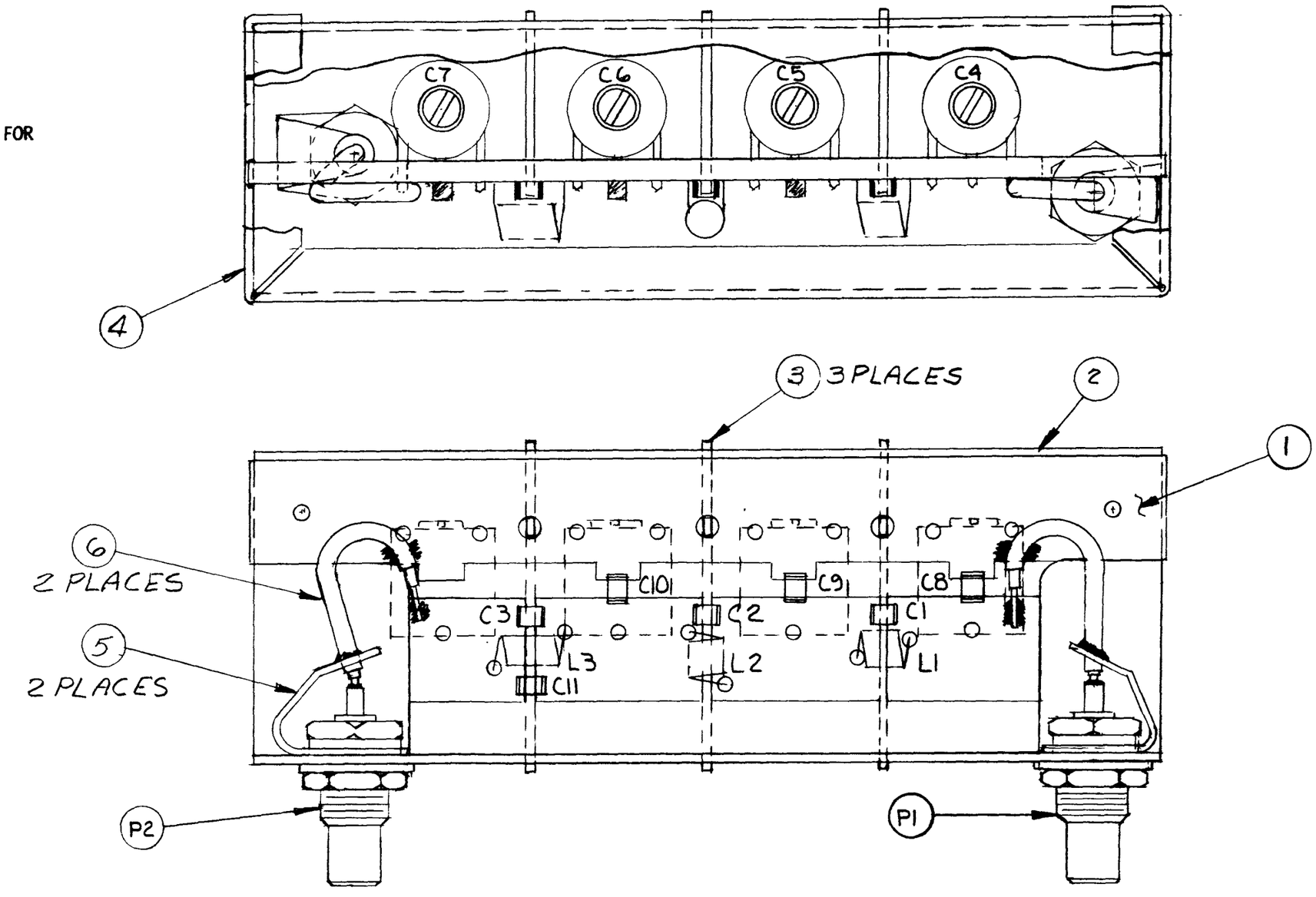


FIGURE 4-16
LP FILTER ASSEMBLY

PROJECT CONTROL	LTR	DESCRIPTION	DATE	
	—	INITIAL RELEASE	12-20-83	N16595-58

DWG NO. PL25-P29182B001 SH 1

*APPLICATION	
NEXT ASSY	USED ON
01-P29106B001	PET ACC

ASTERISK INDICATES DATA WHICH IS NONMANDATORY -FOR INFORMATION ONLY

REVISIONS

REV	DESCRIPTION	DATE	APPROVED
A	SEE MCO J29911 86-9-24	86-10-16	[signature]
B	SEE MCO A33631 MPD 87-07-17	87-07-20	[signature]

REV STATUS OF SHEETS				
REV	B	B	B	
SHEET	1	2	3	

SEE SEPARATE WIRE LIST YES ☐ NO ☐

SEE SEPARATE PARTS LIST YES ☐ NO ☐

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS LISTED IN DOD-STD-100

UNLESS OTHERWISE SPECIFIED:		
ALL DIMENSIONS ARE IN INCHES. DWG IS END PROD.	DWN BY S. QUAN	12-12-83
	DOC CHK BY	
TOLERANCES:	DSGN CHK BY	
2 PLACE DEC ±.	MFG	
3 PLACE DEC ±.	PROJ NO. 3643	
HOLE DIA	CONTR NO.	
ANGLE ±	ISSUED	
	APVD [signature]	12-16-83
	APVD [signature]	12/16/83

MOTOROLA INC.
Government Electronics Group
8201 E. McDOWELL RD., P.O. BOX 1417, SCOTTSDALE, ARIZONA 85252

FILTER ASSEMBLY, LOW PASS 400 MHz

SIZE	FSCM NO.	DWG NO.
A	94990	PL25-P29182B001

SCALE | SHEET 1 of 3

FIGURE 4-17
400M LP FILTER. PARTS LIST

4544-04

FIND NO.	QTY U/M	CODE IDENT	DRAWING OR DOCUMENT NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	SUPPLEMENTARY PART/IDENT NO	NOTES
001	1.0000 EA			84-P291838001	PWB,LOW PASS FILTER		
002	1.0000 EA			26-P29184B001	HOUSING		
003	3.0000 EA			26-P29181B001	DIVIDER		
004	1.0000 EA			26-P29185B001	COVER		
005	2.0000 EA			MS35431-7	TERMINAL		
006	AR		MIL-C-17/151	M17/151-00001	CABLE .047-50OHM		
007	AR		QQ-S-571	SN63WRMAP3	SOLDER		
008	AR			11-P1416?A01	INK BLK EPOXY AIR DRY		
901	REF			63-P23691F	SCHEMATIC		
C 001	1.0000 EA			21-P16318A010	CAPACITOR 1PF-.10PF-50		
C 002	1.0000 EA			21-P16516A028	CAPACITOR 3.9PF-.25PF-50		
C 003	1.0000 EA			21-P16518A038	CAPACITOR 10PF-5-50		
C 004	1.0000 EA		MIL-C-14409/13	PC26T100	CAPACITOR .8PF-10PF		
C 005	1.0000 EA		MIL-C-14409/13	PC26T100	CAPACITOR .8PF-10PF		
C 006	1.0000 EA		MIL-C-14409/13	PC26T100	CAPACITOR .8PF-10PF		

FIND NO.	QTY U/M	CODE IDENT	DRAWING OR DOCUMENT NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	SUPPLEMENTARY PART/IDENT NO	NOTES
C 007	1.0000 EA		MIL-C-14409/13	°C26T10J	CAPACITOR .5PF-10PF		
L 001	1.0000 EA			24-P29156B0J1	COIL 4T,.11ID		
L 002	1.0000 EA			24-P29136B002	COIL 4T,.089ID		
L 003	1.0000 EA			24-P29186B0J3	COIL 2T,.089ID		
P 001	1.0000 EA	93291		52-043-0000	CONNECTOR JACK,RF		
P 002	1.0000 EA	93291		52-043-0J00	CONNECTOR JACK,RF		

PROJECT CONTROL	LTR	DESCRIPTION	DATE	APPROVED
	—	INITIAL RELEASE	12-20-83	N/C 85-58

DWG NO. PL25-P29182B002

*APPLICATION	
NEXT ASSY	USED ON
01-P29106B002	PET ACC

ASTERISK INDICATES DATA WHICH IS NONMANDATORY -FOR INFORMATION ONLY

REVISIONS

REV	DESCRIPTION	DATE	APPROVED
A	SEE CO J29911-1 86-9-24	86-10-16	Powell
B	SEE MCO A33631 MPD 87-07-17	87-07-20	A/Ferguson

REV																		
SHEET																		
REV STATUS OF SHEETS	REV																	
	SHEET																	
REV																		
SHEET																		
REV STATUS OF SHEETS	REV	B	B	B														
	SHEET	1	2	3														

SEE SEPARATE WIRE LIST YES ☐ NO ☐

SEE SEPARATE PARTS LIST YES ☐ NO ☐

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS LISTED IN DOD-STD-100

.ESS OTHERWISE SPECIFIED:
ALL DIMENSIONS ARE IN NCHES. DWG IS END PROD.

TOLERANCES:

2 PLACE DEC ± .

3 PLACE DEC ± .

HOLE DIA

ANGLE ±

DWN BY S. QUAN 12-12-83
DOC CHK BY
DSGN CHK BY
MFG
PROJ NO. 3643
CONTR NO.
ISSUED
APVD Quantonk. 12-16-83
APVD N E Brown 12/16/83

MOTOROLA INC.
Government Electronics Group
8201 E. McDOWELL RD., P.O. BOX 1417, SCOTTSDALE, ARIZONA 85252

FILTER ASSEMBLY, LOW PASS 270 MHz

SIZE	FSCM NO.	DWG NO.
A	94990	PL25-P29182B002

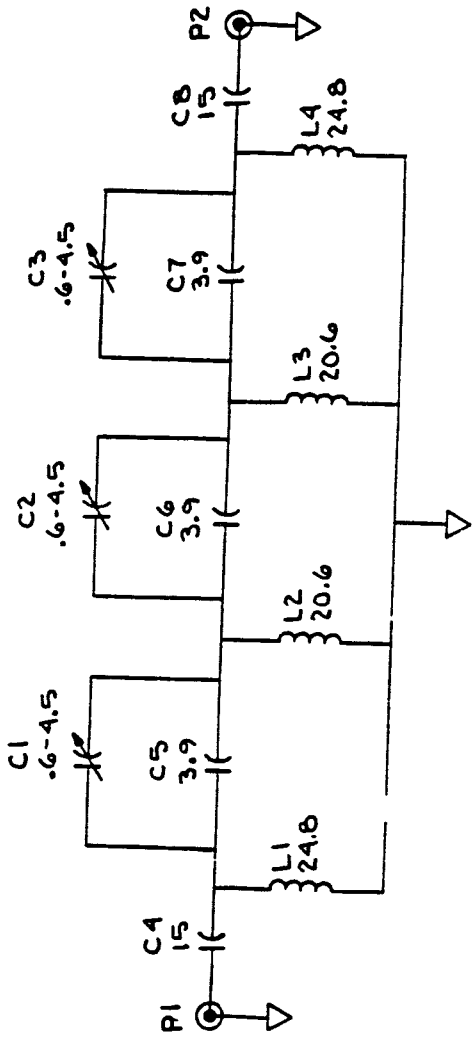
SCALE | SHEET 1 of 3

'14-1 1980 DRAWING FORMAT 1/82

FIGURE 4-18
270M LP FILTER. PARTS LIST Pg. 4-41

FIND NO.	QTY U/M	CODE IDENT	DRAWING OR DOCUMENT NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	SUPPLEMENTARY PART/IDENT NO	NOTES
001	1.0000 EA			94-P29183B001	PWB,LOW PASS FILTER		
002	1.0000 EA			26-P29184B001	HOUSING		
003	3.0000 EA			26-P29181B001	DIVIDER		
004	1.0000 EA			26-P29185B001	COVER		
005	2.0000 EA			MS35431-7	TERMINAL		
006	AR		MIL-C-17/151	M17/151-00001	CABLE		
007	AR		QQ-S-571	SN63WRMAP3	SOLDER		
008	AR			11-P14167A01	INK BLK EPOXY AIR DRY		
901	REF			63-P23682F	SCHEMATIC		
C 001	1.0000 EA			21-P16318A024	CAPACITOR 2.7PF-.25PF-50		
C 002	1.0000 EA			21-P16318A038	CAPACITOR 10PF-5-50		
C 003	1.0000 EA			21-P16318A010	CAPACITOR 1PF-.10PF-50		
C 004	1.0000 EA		MIL-C-14409/13	PC25T100	CAPACITOR .5PF-10PF		
C 005	1.0000 EA		MIL-C-14409/13	PC25T100	CAPACITOR .8PF-10PF		
C 006	1.0000 EA		MIL-C-14409/13	PC25T100	CAPACITOR .5PF-10PF		

FIND NO.	QTY U/M	CODE IDENT	DRAWING OR DOCUMENT NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	SUPPLEMENTARY PART/IDENT NO	NOTES
C 007	1.0000 EA		MIL-C-14409/13	PC26T100	CAPACITOR .8PF-10PF		
C 008	1.0000 EA			21-P16318A038	CAPACITOR 10PF-5-50		
C 009	1.0000 EA			21-P16318A040	CAPACITOR 12PF-5-50		
C 010	1.0000 EA			21-P16318A036	CAPACITOR 8.2PF-5-50		
C 011	1.0000 EA			21-P16318A045	CAPACITOR 27PF-5-50		
L 001	1.0000 EA			24-P291868001	COIL 4T,.11ID		
L 002	1.0000 EA			24-P291868002	COIL 4T,.069ID		
L 003	1.0000 EA			24-P291868003	COIL 2T,.069ID		
P 001	1.0000 EA	98291		52-043-0000	CONNECTOR JACK,RF		
P 002	1.0000 EA	98291		52-043-0000	CONNECTOR JACK,RF		



NOTES:

1. FOR REFERENCE DRAWINGS REFER TO 01-P291878001 ASSEMBLY.
2. UNLESS OTHERWISE SPECIFIED
   ALL RESISTORS ARE IN OHMS ±5 PCT, 1/4 WATT(S).
   ALL CAPACITORS ARE IN μF.
   ALL INDUCTORS ARE IN nH.
   ALL VOLTAGES ARE IN DC.

MOTOROLA PART NUMBER		
01-P291878001	PET. ACC.	
NEXT ASSY	USED ON	
*APPLICATION		

UNLESS OTHERWISE SPECIFIED:
ALL DIMENSIONS ARE IN INCHES.
DRAWING IS END PRODUCT.
TOLERANCES:
2 PLACE DEC ±. 3 PLACE DEC ±.
HOLE DIA ANGLE ±
SHARP EDGES BROKEN MAX
DIM LIMITS APPLY: BEFORE ☐ PLATING ☐ AFTER ☐ PAINTING ☐

SEE SEPARATE PARTS LIST YES ☐ NO ☐ | SEE SEPARATE WIRE LIST YES ☐ NO ☐
INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS LISTED IN GOD-STD-100.

DWN BY K. Frock 9-13-83	MOTOROLA INC. Government Electronics Group 8201 E. McDOWELL RD., P.O. BOX 1417, SCOTTSDALE, ARIZONA 85252
DOC CHK BY	
DSGN CHK BY	
MFG	225 MHz HIGH-PASS FILTER
PROJ NO. 3643	
CONTR NO.	
ISSUED	SIZE FSCM NO. DWG NO.
APVD R2 Brown	
APVD	

FIGURE 4-19
225M HP FILTER. SCHEMATIC

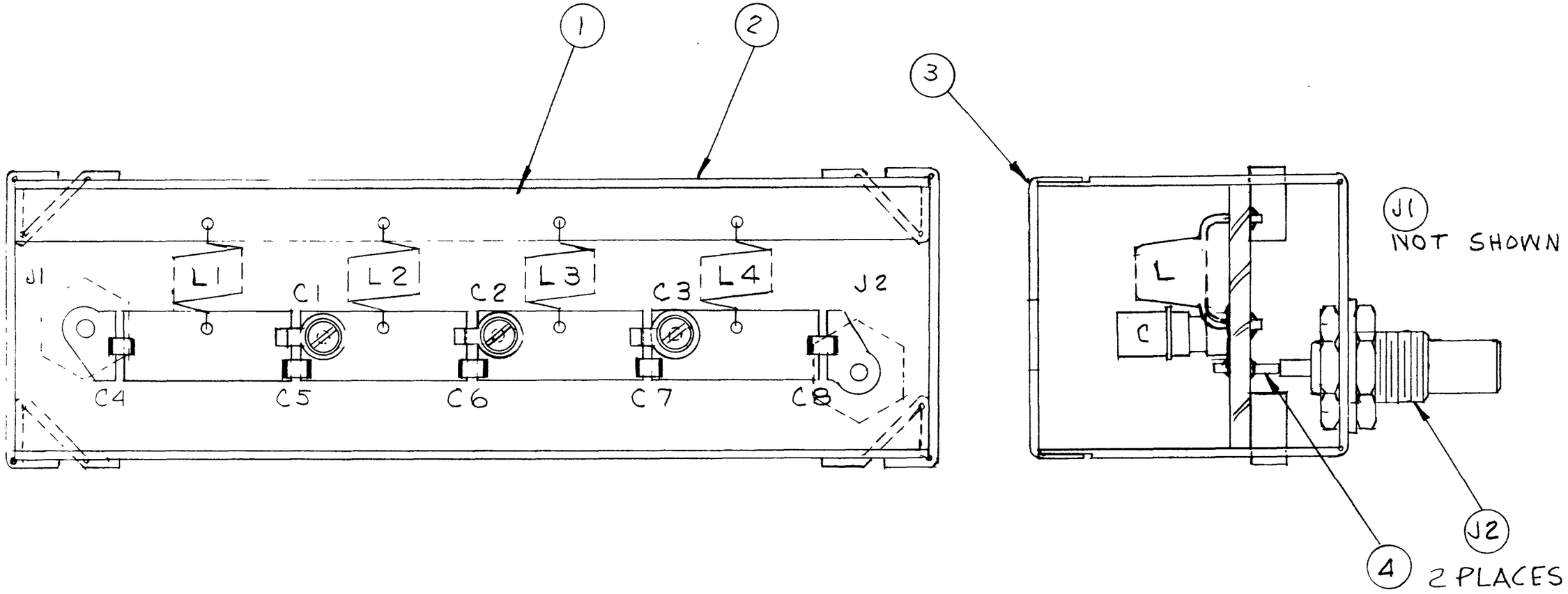


FIGURE 4-20
225M HP FILTER ASSEMBLY

PROJECT CONTROL	DTR	DESCRIPTION	DATE	APPROVED
	—	INITIAL RELEASE	12-20-83	N16585-58

DWG NO. PL25-P29187B001 SH 1

*APPLICATION	
NEXT ASSY	USED ON
01-P29106B002	
01-P29106B001	PET ACC

ASTERISK INDICATES DATA WHICH IS NONMANDATORY -FOR INFORMATION ONLY

REVISIONS

REV	DESCRIPTION	DATE	APPROVED
A	REVISED PER MCO 84-6-21	84-5-17	N16769

REV																		
SHEET																		
REV STATUS OF SHEETS	REV																	
	SHEET																	
REV																		
SHEET																		
REV STATUS OF SHEETS	REV	A	A	A														
	SHEET	1	2	3														

SEE SEPARATE WIRE LIST YES ☐ NO ☐

SEE SEPARATE PARTS LIST YES ☐ NO ☐

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS LISTED IN DOD-STD-100

UNLESS OTHERWISE SPECIFIED:

ALL DIMENSIONS ARE IN INCHES. DWG IS END PROD.

TOLERANCES:

2 PLACE DEC ± .

3 PLACE DEC ± .

HOLE DIA

ANGLE ±

DWN BY S. QUAN 12-12-83

DOC CHK BY

DSGN CHK BY

MFG

PROJ NO. 3643

CONTR NO.

ISSUED

APVD Quantor K. 12-16-83

APVD NTYoung 12/16/83

MOTOROLA INC.
Government Electronics Group
8201 E. McDOWELL RD., P.O. BOX 1417, SCOTTSDALE, ARIZONA 85252

FILTER ASSEMBLY, HIGH PASS

SIZE	FSCM NO.	DWG NO.
A	94990	PL25-P29187B001

SCALE

SHEET 1 of 3

FIGURE 4-21
225M HP FILTER. PARTS LIST

PARTS LIST MOTOROLA INC. GEG CONTRACT NO. CODE IDENT 94990 PL 25-P29187B PN 25-P29187B001 REV LTR A SHEET 2

FIND NO.	QTY U/M	CODE IDENT	DRAWING OR DOCUMENT NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	SUPPLEMENTARY PART/IDENT NO	NOTES
001	1.0000 EA			64-P29188B001	PWB,HIGH PASS		
002	1.0000 EA			26-P29189B001	HOUSING		
003	1.0000 EA			26-P29190B001	COVER		
004	AR	QQ-W-343			WIRE #22	30-15073A22	
005	AR	QQ-S-571		SN63WRMAP3	SOLDER		
901	REF			63-P23680F	SCHEMATIC		
C 001	1.0000 EA	91293		27273	CAPACITOR 0.6-4.5PF	PC24J4R5	
C 002	1.0000 EA	91293		27273	CAPACITOR 0.6-4.5PF	PC24J4R5	
C 003	1.0000 EA	91293		27273	CAPACITOR 0.6-4.5PF	PC24J4R5	
C 004	1.0000 EA			21-P16318A042	CAPACITOR 15PF-5-50		
C 005	1.0000 EA			21-P16318A028	CAPACITOR 3.9PF-.25PF-50		
C 006	1.0000 EA			21-P16318A028	CAPACITOR 3.9PF-.25PF-50		
C 007	1.0000 EA			21-P16318A028	CAPACITOR 3.9PF-.25PF-50		
C 008	1.0000 EA			21-P16318A042	CAPACITOR 15PF-5-50		

FIND NO.	QTY U/M	CODE IDENT	DRAWING OR DOCUMENT NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	SUPPLEMENTARY PART/IDENT NO	NOTES
L 001	1.0000 EA			24-P29186B001	COIL 4T..111D		
L 002	1.0000 EA			24-P29186B002	COIL 4T..0891D		
L 003	1.0000 EA			24-P29186B002	COIL 4T..0891D		
L 004	1.0000 EA			24-P29186B001	COIL 4T..111D		
P 001	1.0000 EA	98291		52-043-0000	CONNECTOR JACK,RF		
P 002	1.0000 EA	98291		52-043-0000	CONNECTOR JACK,RF		