MOBILE RADIO

MASTR® Progress Line

MOBILE CONTROL UNIT MODELS 4EC59A10-25

Maintenance Manual LBI-3937C
DATAFILE FOLDER DF4080**********

SPECIFICATIONS *

MODEL NUMBERS	4EC59A10 through 4EC59A25
USED WITH	MASTR Royal Professional Mobile Combinations
CONTROLS	VOLUME Control
	OFF-ON-STBY Switch
	SQUELCH Control
	Optional Controls
	Two-Frequency Selector Switch
	CHANNEL GUARD Monitor Switch
	SPEAKER-OFF Monitor Switch
	Dimmer Control for Pilot Lights
INDICATORS	Transmitter filament-on light: green
	Transmit light: red

EC-59-A

*These specifications are intended primarily for the use of the serviceman. Refer to the appropriate Specification Sheet for the complete specifications.

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ILLUSTRATIONS

WARNING

No one should be permitted to handle any portion of the equipment that is supplied with voltage of RF power; or to connect any external apparatus to the units while the units are supplied with power. KEEP AWAY FROM LIVE CIRCUITS.

DESCRIPTION

MASTR Progress Line Control Units are compact, highly functional control units that are designed for either Trunk-Mount or Front-Mount MASTR mobile combinations.

In Trunk-Mount installations, a plate is installed on the back of the Control Unit to hold the connectors. A mounting bracket is provided for mounting the Control Unit within convenient reach of the operator. In Front-Mount installations, the Control Unit is attached to the front of the MASTR Two-Way Radio.

Cable connections are secured to the Control Unit by means of captive locking screws.

CIRCUIT ANALYSIS

The OFF-ON-STBY (standby) switch determines whether or not the transmitter and receiver are operative. With the switch in the OFF position, all power is removed from the Two-Way Radio. Turning the switch to STBY applies power to the receiver only, and the green light does not light.

Turning the switch to the ON position enables the push-to-talk (PTT) circuit, lights the green pilot light, and applies +12 volts to the receiver and power regulator.

Pushing the PTT button on the microphone lights the red pilot light, energizes the antenna changeover relay, and applies a keyed voltage to the transmitter and power regulator. The keyed voltage also mutes the receiver audio stages.

CONTROLS

All models of the Control Unit have VOLUME and SQUELCH controls, and an OFF-ON-STBY switch. Depending on the model number, some of the Control Units may have one or more of the controls described in the following paragraphs. A chart showing which controls are present on each Control Unit Model is provided on the Control Unit Wiring Diagram.

Instructions for adjusting the controls are in the Operator's Manual for the Two-Way Radio.

Two-Frequency Switch (S704)

For two-frequency radios, the transmitter and receiver Channel Guard will operate only when the frequency selector switch is in the F1 position.

SPEAKER-OFF Switch (S702)

The SPEAKER-OFF switch is used whenever a telephone handset and hookswitch is used. The switch operates in parallel with the hookswitch and, in the SPEAKER position, overrides the speaker muting circuit in the handset hookswitch. Calls can then be heard from the speaker, regardless of whether the handset is on or off the hookswitch.

With the switch in the OFF position and the handset off the hookswitch, calls are heard only from the handset earpiece. The speaker still operates with the handset hung up.

CHANNEL GUARD-OFF Switch (S703)

Placing this switch in the OFF position disables the receiver Channel Guard so that the receiver operates on noise squelch only.

Dimmer Control (R705 - Optional)

The dimmer control is a rheostat in series with the green pilot light. Turning the control adjusts the amount of light given off by the green pilot light.

VEHICLE IGNITION SWITCH CONNECTIONS

The Control Unit may be connected for three different modes of operation, depending on the way the three ignition switch cables are connected in the vehicle system. The black ignition switch cable provides the receiver ground connection. The yellow fused lead provides the receiver hot connections, and the red fused lead provides the +12 volts for the power regulator. The three types of operation are:

1. Ignition Switch Standby

For this type of operation, the red fused lead (power regulator voltage) is connected to the ACCESSORY or ON terminal of the ignition switch. The yellow fused lead (receiver hot) is connected to the hot side of the ignition switch, and the black lead connects to vehicle ground.

With the ignition switch OFF, the receiver automatically reverts to STBY, ready to receive messages. Turning the ignition switch to the ON or ACCESSORY position turns on the green pilot light and supplies power regulator voltage. Turning the OFF-ON-STBY switch to OFF removes all power to the Two-Way Radio.

2. Ignition Switch Control

For ignition switch control, the yellow and red fused leads are connected to the ACCESSORY or ON terminal of the ignition switch. The transmitter and receiver will operate only when the ignition switch is in the ACCESSORY or ON position. Turning the ignition switch OFF removes all power to the radio.

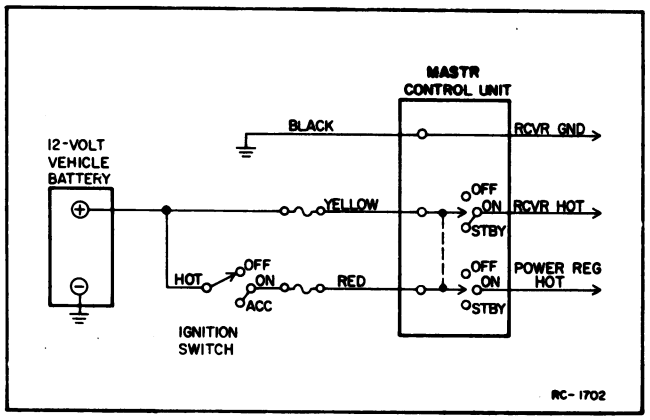

Figure 1 — 12-VDC Connections for Ignition Switch Standby

3. Ignition Switch Bypass

For ignition switch bypass, the yellow and red fused leads connect to the "hot" side of the ignition switch or the vehicle fuse block assembly. Both the transmitter and receiver operate independently of the ignition switch and can be turned on the off only by the OFF-ON-STBY switch on the MASTR Control Unit.

MAINTENANCE

DISASSEMBLY

In Trunk-Mount installations, access to the inside of the Control Unit is obtained by removing the two Phillips-head screws in the back of the unit and pulling the back panel away from the housing.

In Front-Mount installations, remove the two Phillips-head screws holding the front casting to the frame and move the casting away from the frame. Next, remove the two screws securing the control cable plug to the inside of the front casting. Then remove the two flat-heat screws holding the Control Unit to the front casting.

PILOT LIGHT REPLACEMENT

The pilot lights can be easily replaced without disassembling the Control Unit. First, unscrew the colored lens. Then wrap a small piece of masking tape around the bulb, to give the fingers a firm grip, and unscrew the bulb.

REINSTALLATION

The Royal Professional mobile combination operates in 12-volt, negative ground vehicle systems only! If the radio is ever moved to a different vehicle, always check the battery polarity and voltage of the new system before using the radio.

CAUTION

Do not install the Royal Professional in a vehicle system using a circuit breaker. The radio must be operated in a system protected by a 15-amp quick blow fuse (similar to GE Fuse Assembly 19B216021-G4 and fuse 1R11-P4).

If it becomes necessary to move the Two-Way Radio and Control Unit to another vehicle, the 25-pin control cable plug may need to be disassembled. Refer to Figure 2 for disassembly of the plug.

NOTE

The plug is assembled so that the cable comes out of the top of the plug when connected to the Control Unit. To have the cable come out of the bottom of the plug, remove the remaining two screws and rotate the metal frame 180 degrees.

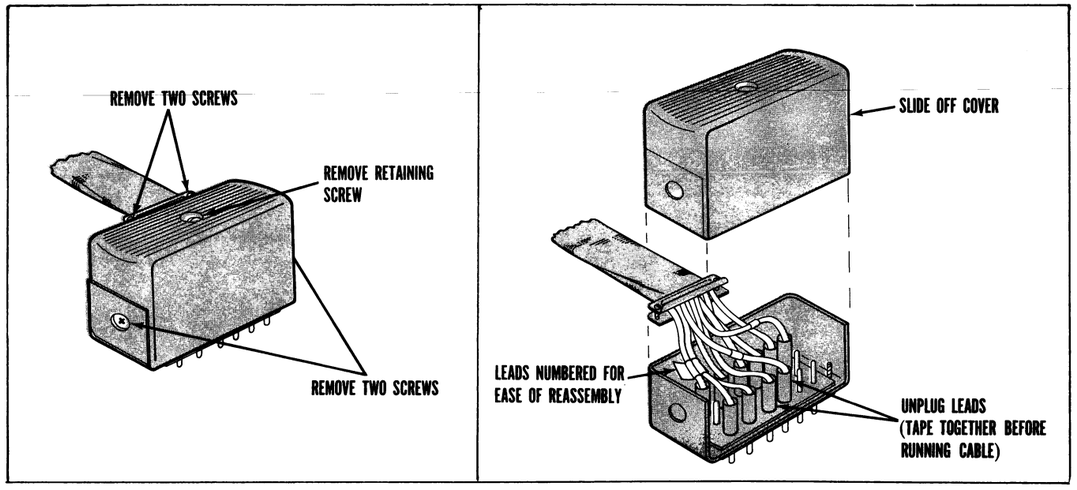

Figure 2 - Disassembly of Control Cable Plug

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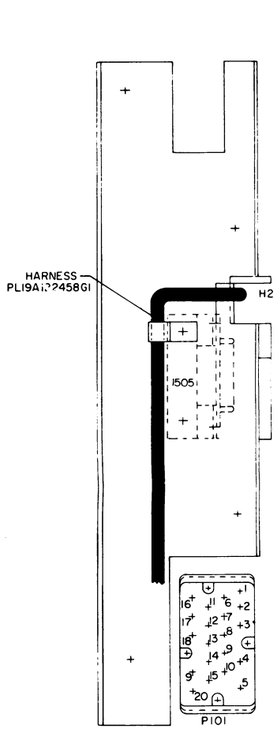
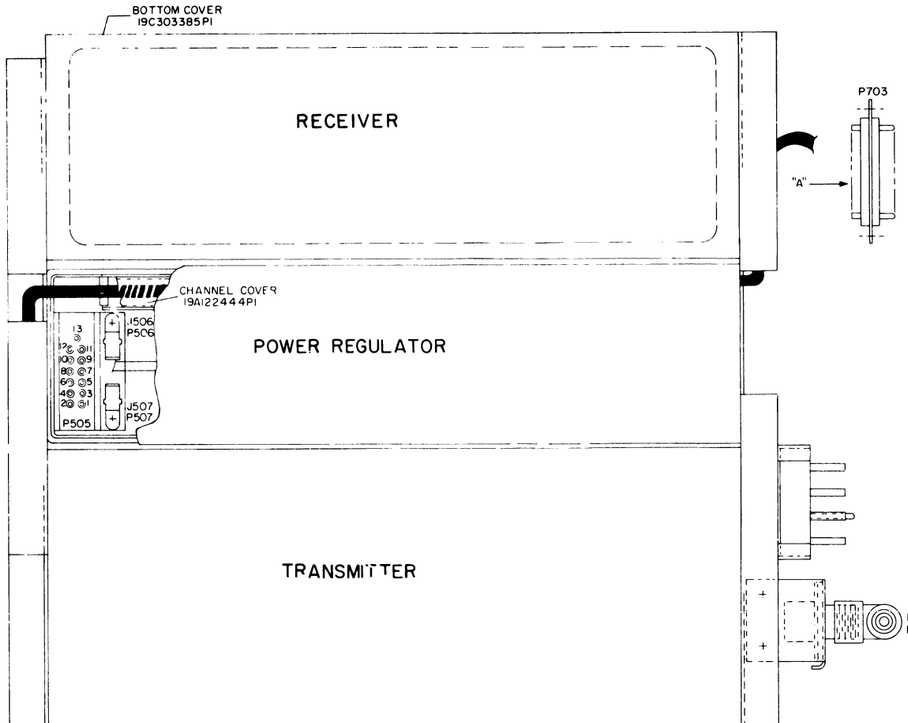
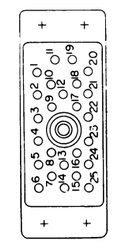
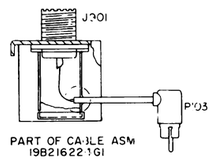
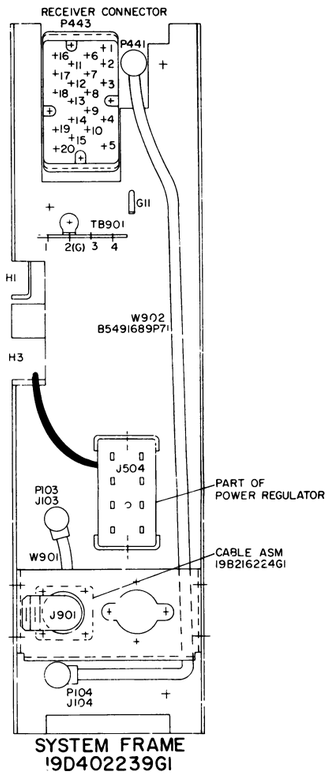
GENERAL ELECTRIC

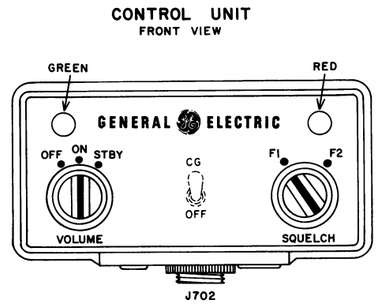


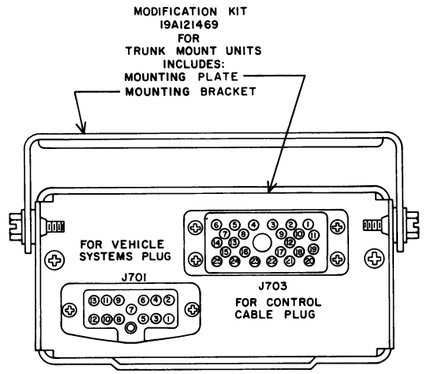












SYMBOL	FUNCTION
R701	VOLUME CONTROL
R702	SQUELCH CONTROL
S701	OFF-ON-STBY CONTROL
S703	CHANNEL GUARD-OFF
R707	SQUELCH CONTROL-PART OF S704
S704	FREQUENCY SELECTOR

OUTLINE DIAGRAM

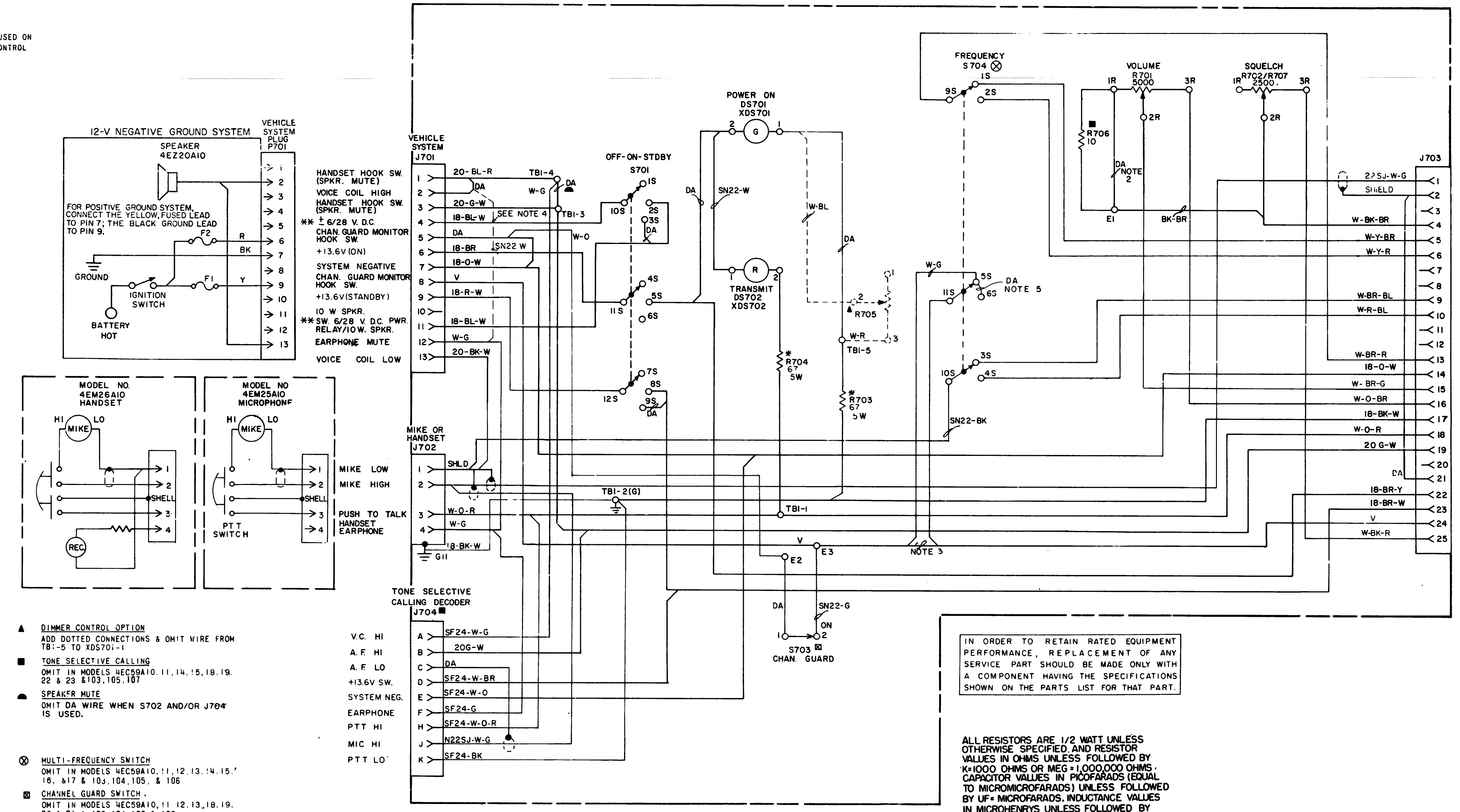
MOBILE CONTROL UNIT
MODELS 4EC59A10-25

(19D413204, Rev. 2)

(19C303800, Rev. 2)

CONTROL UNIT

**TERMINALS 4 & 11 ARE USED ON 12 VOLT SYSTEMS FOR CONTROL OF 10-WATT SPEAKER.



MODEL NUMBER	REV. LETTER	NO. OF FREQ.	CHANNEL GUARD MONITOR SWITCH	TONE OPTION JACK
4EC59A10	D	1		
4EC59A11	D	1		
4EC59A12	H	1		X
4EC59A13	H	1		X
4EC59A14	D	1	X	
4EC59A15	D	1	X	
4EC59A16	H	1	X	X
4EC59A17	H	1	X	X
4EC59A18	F	2		
4EC59A19	F	2		
4EC59A20	K	2		X
4EC59A21	K	2		X
4EC59A22	F	2	X	
4EC59A23	F	2	X	
4EC59A24	K	2	X	X
4EC59A25	K	2	X	X
4EC59A103	A	1		
4EC59A104	B	1		X
4EC59A105	A	1	X	
4EC59A106	B	1	X	X
4EC59A107	A	2		
4EC59A108	B	2		X
4EC59A109	A	2	X	
4EC59A110	B	2	X	X

▲ DIMMER CONTROL OPTION
ADD DOTTED CONNECTIONS & OMIT WIRE FROM TB1-5 TO XDS701-1

■ TONE SELECTIVE CALLING
OMIT IN MODELS 4EC59A10, 11, 14, 15, 18, 19, 22 & 23 & 103, 105, 107

◓ SPEAKER MUTE
OMIT DA WIRE WHEN S702 AND/OR J704 IS USED.

⊗ MULTI-FREQUENCY SWITCH
OMIT IN MODELS 4EC59A10, 11, 12, 13, 14, 15, 16, & 17 & 103, 104, 105, & 106

⊠ CHANNEL GUARD SWITCH.
OMIT IN MODELS 4EC59A10, 11, 12, 13, 18, 19, 20 & 21 & 103, 104, 107, & 108

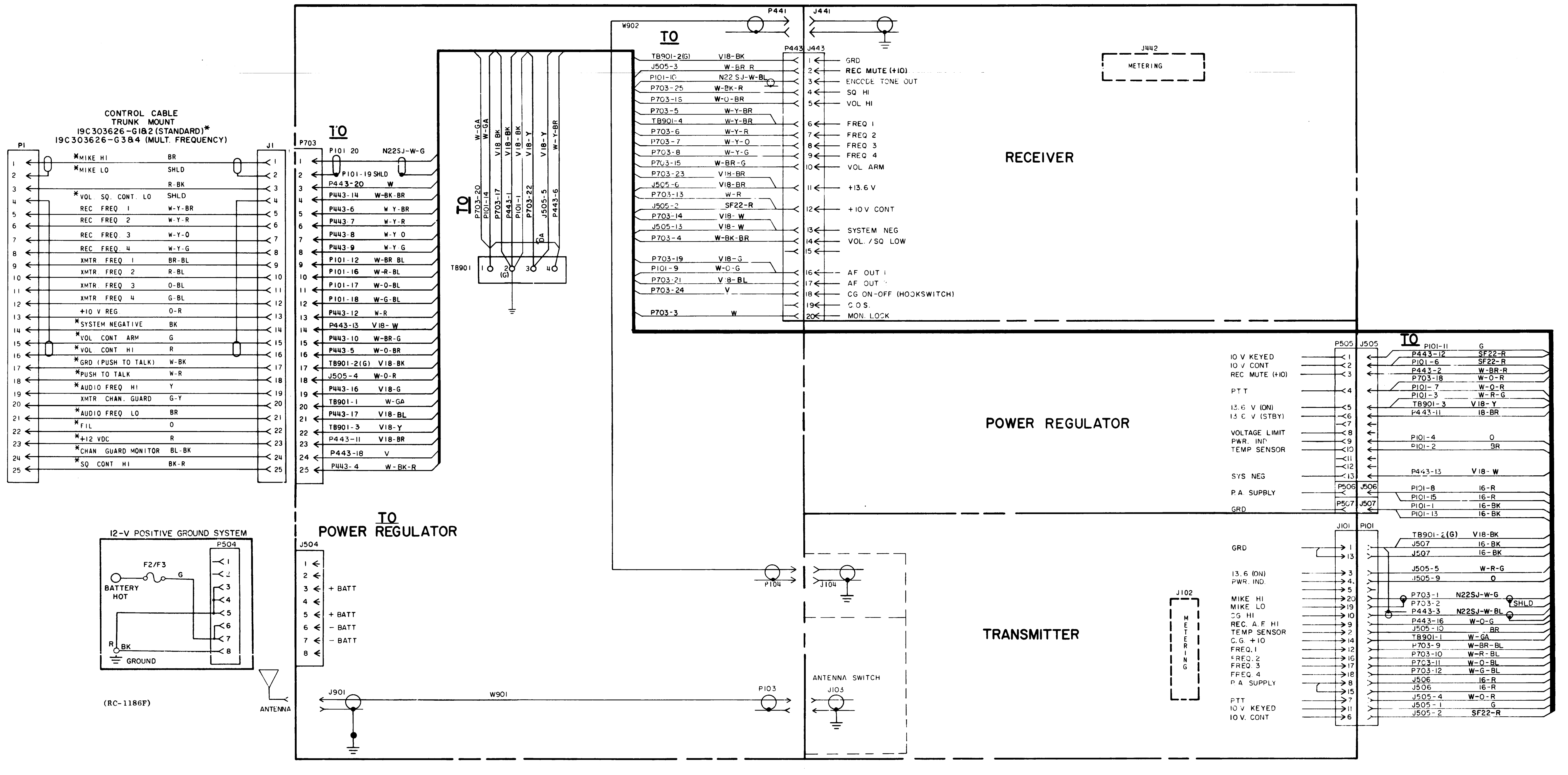
IN ORDER TO RETAIN RATED EQUIPMENT PERFORMANCE, REPLACEMENT OF ANY SERVICE PART SHOULD BE MADE ONLY WITH A COMPONENT HAVING THE SPECIFICATIONS SHOWN ON THE PARTS LIST FOR THAT PART.

ALL RESISTORS ARE 1/2 WATT UNLESS OTHERWISE SPECIFIED. AND RESISTOR VALUES IN OHMS UNLESS FOLLOWED BY K=1000 OHMS OR MEG=1,000,000 OHMS. CAPACITOR VALUES IN PICOFARADS (EQUAL TO MICROMICROFARADS) UNLESS FOLLOWED BY UF=MICROFARADS. INDUCTANCE VALUES IN MICROHENRYS UNLESS FOLLOWED BY MH=MILLIHENRYS OR H=HENRYS.

NOTES:
1. ALL WIRES N24 UNLESS OTHERWISE SPECIFIED.
2. OMIT DA WIRE WHEN R706 IS USED.
3. OMIT CONNECTION WHEN S704 IS USED.
4. ADD W WIRE WHEN PL19B204970G1 HOOKSWITCH IS USED.
5. FOR CHANNEL GUARD ON F1 ONLY REMOVE DA WIRE.
6. IN ENCODE ONLY APPLICATIONS, DA JUMPER FROM TB1-3 TO TB1-4 MUST BE PRESENT.

(19D402341, Rev. 22)

SYSTEM FRAME AND HARNESS



(19D402766, Rev. 10)

SCHEMATIC & INTERCONNECTION DIAGRAMS

MOBILE CONTROL UNIT, MODELS 4EC59A10-25

LBI3937

PARTS LIST

LBI3935C

CONTROL UNIT - 19D413054G1-G4
MODELS 4EC59A10-25
AND
ASSOCIATED ASSEMBLIES

SYMBOL	GE PART NO.	DESCRIPTION
		CONTROL UNIT 19D413054G1-G4
		- - - - - - - - DIODES AND RECTIFIERS - - - - - -
CR1	4037822P1	Silicon.
		- - - - - - - - - INDICATING DEVICES - - - - - - - -
DS701 and DS702	19B201122P1	Light, indicator: miniature, 6 v; sim to GE Type 1768.
		- - - - - - - - JACKS AND RECEPTACLES - - - - - - -
J701	19C303576P1	Socket, phen: 13 contacts rated at 5 amps max.
J702		Receptacle. Includes:
	19A116061P2	Receptacle: 4 contacts; sim to Amphenol 91-PN4F-1000.
	19A116061P4	Lockwasher, internal tooth.
	19A116061P5	Nut, knurled: No. 13/16-27N-2.
	19A116049P1	Solderless terminal.
J703	19D402408P1	Connector, phen: 25 contacts rated at 5 amps max.
J704	19B216279G1	Jack assembly: 9 female contacts rated at 5 amps at 900 VRMS; sim to Winchester M9S-LRN.
		- - - - - - - - - - - RESISTORS - - - - - - - - - -
R701		(Part of S701).
R702	19B209124P3	Variable, carbon film: 2.5K ohms ±10%, 1/2 w; sim to Mallory LC(2500).
R703 and R704	5493035P19	Wirewound: 67 ohms ±5%, 5 w; sim to Hamilton Hall Type HR.
R706*	3R77P100K	Composition: 10 ohms ±10%, 1/2 w.
		In Models 4EC59A12,13,16,17 of REV B thru E: In Models 4EC59A20,21,24,25 of REV B thru G:
	3R77P560K	Composition: 56 ohms ±10%, 1/2 w.
		In Models of REV A:
	3R77P271K	Composition: 270 ohms ±10%, 1/2 w.
		In Models earlier than REV A:
	3R77P220K	Composition: 22 ohms ±10%, 1/2 w.
R707		(Part of S704).
		- - - - - - - - - - - SWITCHES - - - - - - - - - -
S701*	19C307089P19	Switch/Resistor: includes Switch, rotary, 3 poles, 3 positions, momentary shorting contacts, 250 ma at 500 VRMS; Resistor (R701), variable, 5K ohms ±20%, 1/2 w max; sim to Mallory LC5K-3133.
		In Models 4EC59A10,11,14 and 15 earlier than REV A: In Models 4EC59A18,19,22 and 23 earlier than REV B: In Models 4EC59A12,13,16 and 17 earlier than REV C: In Models 4EC59A20, 21 and 25 earlier than REV D:
	19C307089P1	Switch/Resistor: includes Switch, rotary, 3 poles, 3 positions, non-shorting contacts, 250 ma at 500 VRMS; Resistor (R701), variable, 5K ohms ±20%, 1/2 w max; sim to Mallory LC5K-3233.
S702 and S703	5491899P5	Toggle: SPST, 3 amps at 250 VAC/VDC; sim to Cutler-Hammer 8280K15.
S704	19C307089P22	Switch/Resistor: includes Switch, rotary, 4 poles, 2 positions, momentary shorting contacts, 250 ma at 500 VRMS; Resistor (R707), variable, 2.5K ohms ±10%, 1 w max; sim to Mallory LC2500-3142.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - TERMINAL BOARDS - - - - - - - -
TB1	7775500P9	Phen: 5 terminals.
		- - - - - - - - - - - SOCKETS - - - - - - - - - - -
XDS701 and XDS702	19B201122P2	Lampholder: sim to Drake Mfg 121 Series.
		MECHANICAL PARTS
		CONTROL UNIT MODELS 4EC59A10 - A25 (19D402303G10 - G25) (SEE RC1170)
1	N529P19C13	Plug button: approx 21/32 inches dia. (Used in Models 4EC59A10, A11, A14, A15, A18, A19, A22 and A23).
2	N529P5C13	Plug button: approx 13/32 inches dia.
3	19A121521G1	Mounting bracket.
4	19B201122P3	Lens cap: green translucent nylon, approx 3/8 inch dia.
5	NP257824	Nameplate. (Used in Models 4EC59A10 and A12).
6	NP257839	Nameplate. (Used in Models 4EC59A11 and A13).
7	NP257821	Nameplate. (Used in Models 4EC59A14 and A16).
8	NP257829	Nameplate. (Used in Models 4EC59A18 and A20).
9	NP257823	Nameplate. (Used in Models 4EC59A19 and A21).
10	NP257832	Nameplate. (Used in Models 4EC59A22 and A21).
11	NP257820	Nameplate. (Used in Models 4EC59A22 and A24).
12	NP257842	Nameplate. (Used in Models 4EC59A23 and A25).
13	19B201122P4	Lens cap: red translucent nylon, approx 3/8 inch dia.
14	19B204443G1	Knob: gray.
15	19C303413P1	Knob: VOLUME/SQUELCH.
16	19D413010P1	Housing.
17	19B204522P1	Mounting plate.
	19A116773P106	Tap screw, Phillips POZIDRIV®: No. 7-19 x 3/8. (Secures backplate to housing).
		ASSOCIATED ASSEMBLIES
	19A121469G1	Control unit modification kit (trunk mount).
	19D402239G1	12 volt vehicle frame.
	19A122444P1	Cover, wire channel (on systems frame).
	19C303452G1	Front casting (Front mount).
	19C303452G2	Front casting (Trunk mount).
	4034260P3	Screw: 10-32 x 1-1/8 (Secures Front casting).
	5491682P2	Lock: Yale and Towne. (Part of Front casting).
	5491682P7	Cam. (Used with lock).
		DIMMER CONTROL MODIFICATION KIT 19A121293G1
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R705	19B209114P1	Variable, wirewound: 75 ohms ±20%, 3 w; sim to CTS Series 112.
		POWER CABLE ASSEMBLY 19C303601G1 (12 VOLT FRONT MOUNT) 19C303601G2 (12 VOLT TRUNK MOUNT)
	19B209189P1	Connector, phen: 8 contacts rate at 15 amps at 1100 VRMS; sim to Beauchaine and Sons S-5401-76.
	19D402438P1	Cap, connector.
	19A121444P2	Connector retaining screw.
	19A115313P1	Cable: 3 conductor, approx 9 feet long. (Used in 19C303601G1).
	19A115314P1	Cable: 3 conductor, approx 18 feet long. (Used in 19C303601G2).

SYMBOL	GE PART NO.	DESCRIPTION
		CONTROL CABLE ASSEMBLY 19C303626G1, G2 (1-FREQ) 19C303626G3, G4 (MULTI-FREQ)
		- - - - - - - - - - - - PLUGS - - - - - - - - - - -
P1	19C303626G5	Plug, male: includes connector 19D402408P3, cap 19C303290P2 and connector retaining screw 19A121444P2.
		- - - - - - - JACKS AND RECEPTACLES - - - - - -
J1	19C303626G6	Plug, female: includes connector 19D402408P1, cap 19C303290P1 and connector retaining screw 19A121444P1.
		- - - - - - - - - - MISCELLANEOUS - - - - - - - -
	19D402408P1	Connector, female phen: 25 contacts rated at 5 amps max.
	19D402408P3	Connector, male phen: 25 contacts rated at 5 amps max.
	19C303290P1	Cap, connector.
	19C303290P2	Cap, connector.
	7139880P11	Cable: 23 conductors. (When ordering specify length). (Used in 19C303626G1 and G2).
	7139880P8	Cable: 13 conductors. (When ordering specify length). (Used in 19C303626G3 and G4).
		VEHICLE SYSTEM CABLE KIT 19A121454G1 (12 VOLT VEHICLES)
	19A121429P1	Pin: 1/2 inch long.
	19A121441G1	Plug: 13 contacts.
	19C303574P1	Cover: approx 1-13/16 x 1 x 1/32 inches.
		FUSED LEAD ASSEMBLY 19A121314G1 (19A121454G1)
	1R16P8	Fuse, cartridge, quick blowing: 5 amps at 250 v; sim to Littelfuse 312005 or Bussmann MTH-5.
	7124109P3	Fuseholder: sim to Bussmann Type HDJ-B.
	7112178P7	Cable: approx 8-3/4 feet long.
		INTERCONNECTION HARNESS ASSEMBLY 19A122458G1
		- - - - - - - JACKS AND RECEPTACLES - - - - - - -
J505	19B204409G1	Plug, male: 13 pin contacts.
		- - - - - - - - - - - PLUGS - - - - - - - - - -
P101	19C303506P1	Connector, phen: 20 contacts rated at 5 amps max at 600 VDC.
P443	19C303506P1	Connector, phen: 20 contacts rated at 5 amps max at 600 VDC.
P703	19D402408P2	Connector, phen: 25 contacts rated at 5 amps max.
		- - - - - - - - - TERMINAL BOARDS - - - - - - - -
TB901	7775500P11	Phen: 5 terminals.
	19A122444P1	Channel Cover.
		ANTENNA CABLE ASSEMBLY 19B216224G1
		- - - - - - - - - - CAPACITORS - - - - - - - - -
C901	19B209141P1	Ceramic disc: .001 µf ±10%, 500 VDCW.
		- - - - - - - JACKS AND RECEPTACLES - - - - - -
J901	2R22P3	Receptacle, panel, coaxial: mica-filled insert, UHF contact. Signal Corps SO-239 or sim to Amphenol 83-1R.
		- - - - - - - - - - - PLUGS - - - - - - - - - -
P103		(Part of W901).

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - - RESISTORS - - - - - - - - - -
R901	3R77P474K	Composition: 470K ohms ±10%, 1/2 w.
		- - - - - - - - - - - CABLES - - - - - - - - - - - -
W901	5491689P56	Cable, RF: coaxial, approx 12 inches long. Includes phono type plug (P103).
	2R22P2	Adapter, right angle, coaxial: polystyrene, UHF contact. Signal Corps M-359; sim to Amphenol 83-1AP. (Front mount only) (Connect to J901).
		RECEIVER RF CABLE ASSEMBLY
		- - - - - - - - - - - - PLUGS - - - - - - - - - - -
P104		(Part of W902).
P441		(Part of W902).
		- - - - - - - - - - - - CABLES - - - - - - - - - -
W902	5491689P71	Cable, Receiver, RF: includes two phono type plugs (P104 and P441), 350 VRMS max, approx 12 inches long.
		12 VOLT FUSEHOLDER 19B216021G4 (Fuses must be ordered separately)
		- - - - - - - - - - - FUSES - - - - - - - - - - -
F1	1R11P4	Quick blowing: 15 amps, 250 v; sim to Bussmann NON15. (Used with 16-38 w MASTR II Mobiles).
F3	1R11P7	Quick blowing: 30 amps, 250 v; sim to Bussmann NON30. (Used with 66-128 w MASTR II and EXECUTIVE II Mobiles).
F4	1R11P5	Quick blowing: 20 amps, 250 v; sim to Bussmann NON20. (Used with 38-66 w MASTR II and 35-66 w EXECUTIVE II Mobiles).
		132-512 MHz ANTENNA 19B209568P1
		Whip assembly. 068110-001.
		Whip nut assembly. 068047-001.
		Base nut assembly. 068048-001.
		"O" Ring (LARGE). 007059-122.
		Stud assembly. 068046-001.
		RG58/U Cable, 15 ft. 068115-001.
		25 - 50 MHz ANTENNA
	7491074P1	Antenna: includes stainless steel rod approx 96-1/2 inches long; ball tip; lockwasher; No. 10-32 hex socket set screw; sim to Antenna Specialists ASPA3BGE.
	7102930P3	Adapter, antenna: approx 2-5/16 inches long. (Used with GE Dwg 7491074P1).
	4KY9A1	Loading coil: 25-33 MHz; sim to Antenna Specialists ASPA87.
	19A121577G1	Antenna hook kit.
	7134724P1	Antenna hook.
	19C307172P1	Antenna Package: Includes base and ball assembly, adapter spring assembly, cable assembly, horseshoe plate, and rubber gasket.
		Base and ball assembly. Newtronics 5495.
		Adapter spring assembly. Newtronics 3327.
		Cable assembly. Newtronics 183-RAO.
		Horseshoe plate. Newtronics 3323-3.
		Rubber gasket. Newtronics 3320.
		HANDSET MODEL 4EM26A10 MODEL 4EM26C10 (SEE RC1394)
1		Self tap screw, bind head: No. 4 x 5/16. Shure Brothers 30C640C.
2		Cable clamp. Shure Brothers 53A532.

SYMBOL	GE PART NO.	DESCRIPTION
3		Shield. Shure Brothers RP19.
4		Switch. Shure Brothers RP81.
5		Case. Shure Brothers RP49. (Used in 4EM26A10).
		Case. Shure Brothers 21RP899F. (Used in 4EM26C10).
6		Adapter. Shure Brothers 65A230.
7		Magnetic controlled cartridge. Shure Brothers RP41.
8	3R77P222K	Resistor, composition: 2200 ohms ±10%, 1/2 w.
9		Receiver cap. (Part of item 5).
10		Washer. Shure Brothers 34A321.
11		Escutcheon. Shure Brothers 53A536A.
12		Actuator. Shure Brothers 53A556.
13		Spring. Shure Brothers 44A140.
14		Plunger bar. Shure Brothers RP82.
15		Flat head screw, socket cap: No. 4-40 x 1/4. Shure Brothers 30C557B.
16		Transmitter cap. Shure Brothers 65A197A. (Part of item 5).
17		Washer. Shure Brothers 34A309.
18		Magnetic controlled cartridge. Shure Brothers RP13.
19		Cable and plug. Shure Brothers RP48. (Used in 4EM26A10).
		Cable and plug. Shure Brothers 21RP738F. (Used in 4EM26C10).
		HOOKSWITCH ASSEMBLY 19B204867G1 (SEE RC1394)
20	4029851P4	Cable clamp; sim to WEC Kesser 3/16-4.
21	19A121612P1	Holder and switch: thermoplastic case, contact rating 1 amp at 125 v.
22	19A121581G1	Cable: approx 8-1/2 feet long, includes five 19A121429P1 pins.
23	5493035P10	Resistor, wirewound, ceramic: 3.5 ohms ±5%, 5 w; sim to Hamilton Hall Type HR.
24	7775500P55	Terminal board, phen: 5 terminals.
		MILITARY MICROPHONE MODEL 4EM25A10 19B209102G1 (SEE RC1163)
1		Cable clamp. Shure Brothers 53A532.
2		Switch. Shure Brothers RP26.
3		Case (back) and mounting button: plastic. Shure Brothers RP67.
4		Switch button: red plastic. Shure Brothers RP25.
5		Spring. Shure Brothers RP16.
6		Shield. Shure Brothers RP23.
7		Magnetic controlled cartridge. Shure Brothers RP13.
8		Case (front): plastic. Shure Brothers RP67.
9		Cable and plug: approx 6 feet long. Shure Brothers RP14.
		5 WATT SPEAKER 19C320302G3 4EZ20A10
LS2	19A116910P1	Permanent magnet: 5 inch, 3.2 ohms ±15% imp, 5 w max operating; sim to Pioneer 002009.
W1	19A121546G1	Cable assembly: approx 48 inches long, includes (2) 19A121429P1 pins.
	19D416396P3	Speaker housing.
	19C320016P2	Mounting support.
	5490407P3	Neoprene grommet. (Upper)
	19A115470P1	Rubber grommet. (Lower)
	19B219692G3	Grille.
	19A116985P1	Screw, hex head-slotted: double lead thread, with internal tooth washer, No. 13-16 x 3/4. (Secures housing to mounting bracket).

PRODUCTION CHANGES

Changes in the equipment to improve performance or to simplify circuits are identified by a "Revision Letter", which is stamped after the model number of the unit. The revision stamped on the unit includes all previous revisions. Refer to the Parts List for descriptions of parts affected by these revisions.

REV. A - Models 4EC59A12, 13, 16, 17, 20, 21, 24 and 25
To make compatible with Universal Selective Calling decoder. Changed R706.

REV. B - Models 4EC59A12, 13, 16, 17, 20, 21, 24 and 25
To reduce speaker minimum audio level when using Universal Selective Calling decoder. Changed R706.

REV. A - Models 4EC59A18, 19, 22 and 23
REV. C - Models 4EC59A20, 21, 24 and 25
To reduce power supply switching noise from modulating transmitter. Removed black wire from ground lug TB1-2 (other end connected to S706-14S) and connected it to microphone jack J702-1.

REV. A - Models 4EC59A10, 11, 14 and 15
REV. B - Models 4EC59A18, 19, 22 and 23
REV. C - Models 4EC59A12, 13, 16 and 17
REV. D - Models 4EC59A20, 21, 24 and 25
To incorporate switch with improved reliability. Changed S701.

REV. B - Models 4EC59A10, 11, 14, 15
REV. C - Models 4EC59A18, 19, 22, 23
REV. D - Models 4EC59A12, 13, 16, 17
REV. E - Models 4EC59A20, 21, 24, 25
To ground microphone jack, added #18 BK-W wire from TB1-2 (G) to G11 and changed J702.

REV. C - Models 4EC59A10, 11, 14, 15
REV. D - Models 4EC59A18, 19, 22, 23
REV. E - Models 4EC59A12, 13, 16, 17
REV. F - Models 4EC59A20, 21, 24, 25
Changed control unit housing from metal to LEXAN®

REV. E - Models 4EC59A18, 19, 22, 23
REV. G - Models 4EC59A20, 21, 24, 25
To provide Channel Guard decode function on all channels. Added jumpers from S706-9S to -10S and from S706-10S to -11S.

REV. H - Models 4EC59A20, 21, 24, 25

REV. F - Models 4EC59A12 13, 16, 17
To reduce audio output level at minimum volume control setting. Changed R706.

REV. G - Models 4EC59A12, 13, 16, 17
To add Mike hi, PTT, earphone and ground to tone option jack J704.

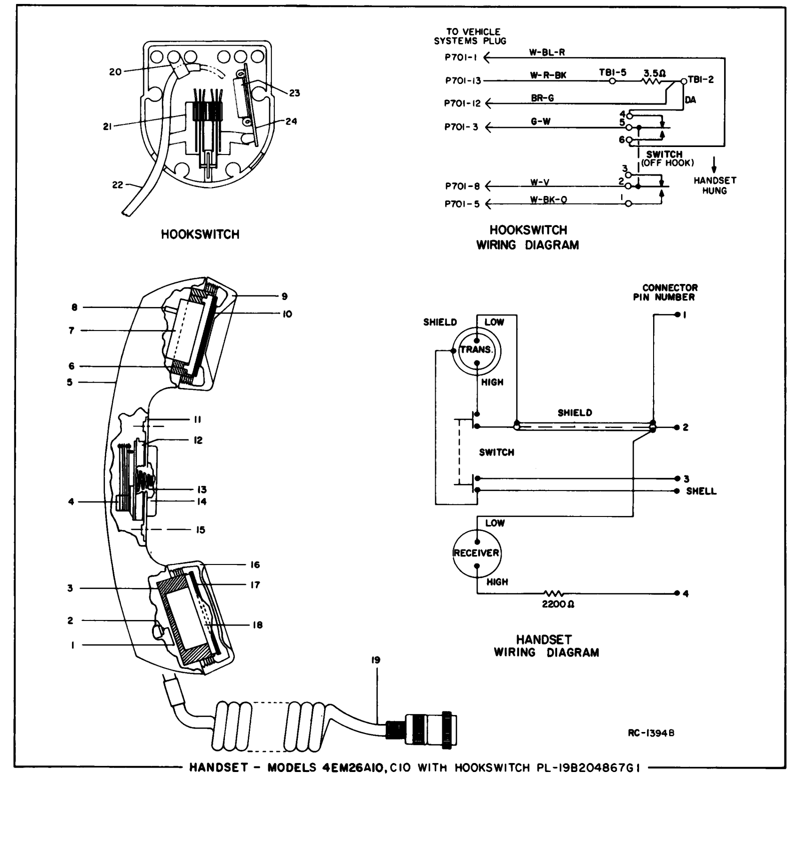
REV. J - Models 4EC59A20, 21, 24, 25
To add Mike hi, PTT, earphone and ground to tone option jack J704.

REV. D - Models 4EC59A10,11,14,15

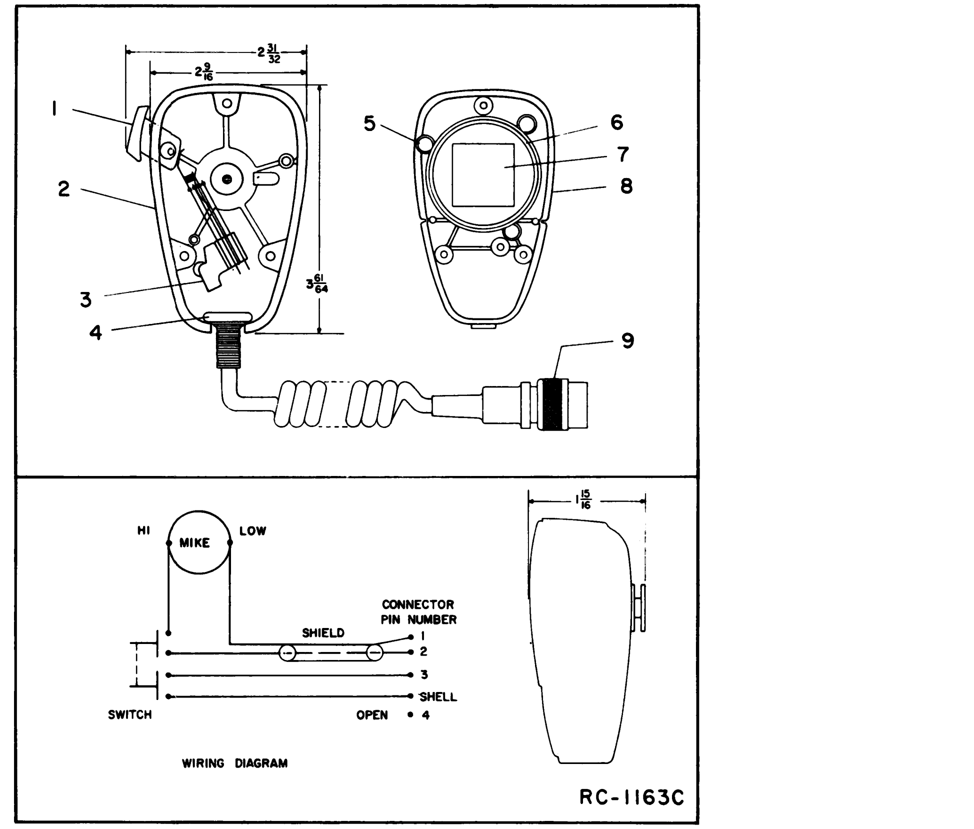
REV. F - Models 4EC59A18,19

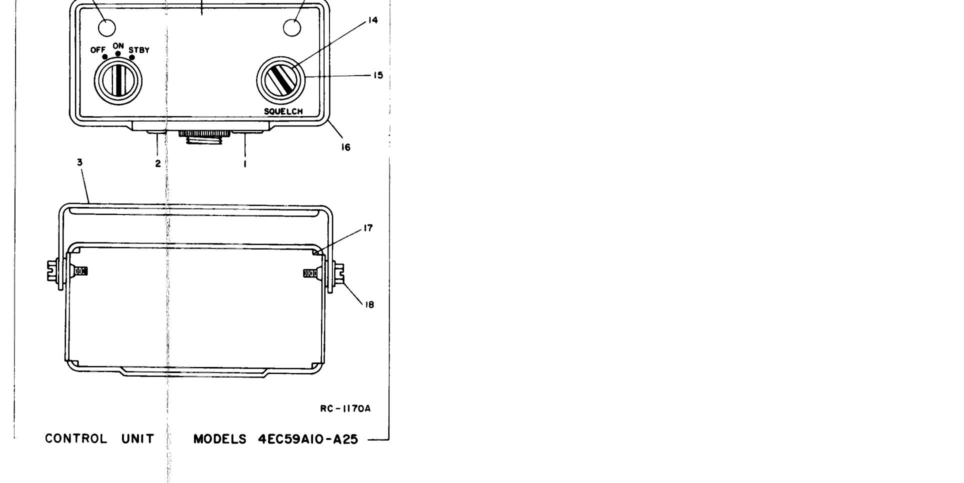
REV. H - Models 4EC59A12,13,16,17

REV. K - Models 4EC59A20-25
Incorporate new housing. Changed housing from 19B216271G1 to 19D413010P1. Changed backplate retaining screw to 19A116773P106.



HANDSET - MODELS 4EM26A10,C10 WITH HOOKSWITCH PL-19B204867G1





CONTROL UNIT MODELS 4EC59A10-A25