GENERAL ELECTRIC



For MASTR II and Executive II Mobile Radios SYSTEMS APPLICATIONS



(Typical Units)

MULTI-FUNCTION CAPABILITY

The C-800 and C-900 Control units are alternate control units for MASTR II and Executive II ("S" Series) mobile radios. Each combines the required operational controls with one or more extra-function "options" which might otherwise be unavailable or require one or more separate control devices. Integrating many functions in a single package also provides great convenience for the operator. No special installation or wiring is necessary because these "system" control units can be plugged into the radio's standard control/power cables. Furthermore, extremely flexible mounting brackets enable the control to be installed almost any where and be positioned for the best visibility and ease of operation.

RUGGED DESIGN

Both units exceed US Forest Service vibration requirements as well as EIA shock and vibration standards. They will also operate at:

> -40°C to +70°C 95% RH at 50°C

±15% variation of nominal supply voltage

PLUG-IN MODULES

A choice of four plug-in "control" modules provide sufficient range to match either a C-800 or C-900 control to the operating requirements of a given mobile. Space is also available on most control modules for additional "options".

Any one of eleven plug-in "option" modules may be added to the Option Deck of the C-800 Control. The C-900 can be equipped with two different "options" selectable from the same group of modules.

BACK-LIGHTED CONTROLS

The pushbutton selectors on the "Option" or "Control" modules are clearly identified as to function and they are individually back-lighted with low powerconsuming Light Emitting Diodes (LEDs) to provide visible status information. Unselected pushbuttons will be at a lower light intensity than selected pushbuttons.

CHANNEL BUSY LED

All "control" modules are equipped with an LED in the lower right corner to give the operator immediate visual indication that his selected channel is busy or available for use.

GENERAL ELECT



Figure 3. C-900 Module Positions

PLUG-IN MODULES



Figure 5. Internal Backplane

The "Option" and "Control" modules are assembled on plug-in circuit boards (see Figures 6 and 7). The connectors or card edges at the back of these boards mate with pins or connectors on a vertical back plane (Figure 5) located inside and at the back of the control unit's housing. Multiple pins extend out through the rear of the housing for connections to the radio's standard power cable (see "A" in Figure 8 on the back page).

A "Control" module must always be installed in the lower deck of the system control unit for proper connection (see Figures 3 and 4 above). For the same reason, "Option" modules plug into the upper deck (or decks). In a C-900 control, either Option Deck may be used for a suitable "Option" module.



The bracket assembly illustrated is furnished with a C-800 or C-900 control unit. Normally, it would be installed on the transmission hump. The legs on base (cf can be swiveled up or down to conform to the contour of the hump.

The control unit is bolted on top of the bracket assembly through curved slots in section (a). Section (b) is also fastened through curved slots to the base (c) and to section (a). This permits the control unit to be rotated up to 120° in either the vertical or horizontal plane, or both.





Figure 6. Typical Option Module



Figure 7. Typical Control Module



Under-the-dash installation may be accomplished by attaching section (a) to the top of the control unit and section (b) underneath the dash. Even in this location, the control can be fully rotated in two planes for best orientation.

RIC MASTR Mobile "Systems" Control Units

OPTION DECK MODULES

Any one of the following eleven modules may be added to the Option Deck of a C-800 control unit. Except for duplicate functions or decoder options, any two of the eleven option modules may be applied to a C-900 control unit and be located in either Option Deck. A control unit with any of these Options is fully compatible with MASTR II mobile radios. However, control units with the Public Address should not be applied to Executive II ("S" Series) mobile radios; all others would be fully applicable.

For MASTR II and Executive II "S" Series Mobiles

MULTIPLE TONE CHANNEL GUARD ENCODERS

Eight Tone Module



Two Tone Module

The eight tone, solid state Channel Guard encoder module will continuously generate any one of eight pre-set EIA tone squelch frequencies. The tone is selected by depressing the desired pushburton and it is sent out each time the transmitter is keyed. At the end of a transmission, a reversedphase tone pulse is generated to eliminate the "squelch tail" which would otherwise be heard.

The choice of tone is completely independent of the position of the RF channel selector switch.

Changing a tone frequency on any position, entails only a simple mechanical change on the module's logic board. There are no tone elements to replace,

The pushbutton marked "CG" enables or disables the encoder and turns the LEDs (behind the other pushbuttons) on or off. When a tone pushbutton is selected, its LED becomes brighter. The tone pushbuttons are interlocked to prevent more than one tone being selected. If less than eight tones are desired, the unwanted switches will be blocked open.

The two tone CG module is similar to the eight tone module except only two selector switches are provided.

FOUR CHANNEL PSLM



The module above provides four frequency Priority Search Lock Monitor (PSLM). It operates like, and offers the same performance characteristic as any other General Electric PSLM Option. In addition, it has the ability to search a variable number of channels up to the maximum provided by the module; in this case ... four. On radios with 5 or more channels, a 5th channel can be searched as the priority channel when the channel selector is on position 5 or above.

EIGHT CHANNEL PSLM



The pushbutton labeled "SRCH" turns the PSLM function on or off. When it is depressed, all the channel selector buttons will be dimly lit. Pushing any one or more of the channel selectors will cause its LED to appear brighter.

The channel selectors are marked 1, 2, 3 & 4. They select the non-priority channels.

The priority channel is selected by the Control Module's channel selector rotary wheel or pushbutton. Of course, it also selects the transmit frequency (and the receive frequency when the PSLM switch is off).

A signal on one of the monitored channels will cause the LED associated with that position to attain full brightness. If it is a non-priority channel, the light will flicker. On the priority channel, the light will be steady. The audio on the priority channel will also sound louder.

This module operates the same as the four frequency PSLM module except it has the capability of monitoring any combination of channels from 2 to 8.

OPTION DECK MODULES

For MASTR II and Executive II "S" Series Mobiles

TYPE 90 TONE MODULES Decoder or Encoder



The Decoder — will respond to one discreet Type 90 tone and will unmute the radio's speaker. At the same time, an alert tone will sound and the LED behind the CALL pushbutton will brighten and flash. Pushing the CALL button resets the circuit. The CALL pushbutton also can be used to monitor the channel. If automatic reset or monitoring is desired, a microphone or handset hookswitch may be added. Also, one or two optional relays and pushbuttons can be added to the module to activate external alarm devices such as a horn or light.

TYPE 90 TONE MODULE

Combined Decoder/Encoder



TYPE 99 TONE DECODER MODULE
 For Selective Signalling

CALL		
La		

Type 99 solid state tone decoders are used primarily for Selective Calling. Up to 900 individual codes are available using a sequential two tone system. The tones range in frequency from 517.5 to 962.5 Hz.

"WILD CARD" MODULE



The two outboard pushbuttons are momentary action switches. The other three pushbuttons are two position switches. All pushbuttons are back-lighted with LEDs which increase in light level when activated. The switches are rated 1A @ 13.8 VDC.

PUBLIC ADDRESS & EXTERNAL SPEAKER

(For MASTR II Mobiles only)



The PA module is furnished complete with an outdoor speaker, mounting hardware and 20' of speaker cable.

The Type 90 Encoders and Decoders utilize a single pulse tone system for signalling or control purposes. The circuit is all solid state and uses a single replaceable tone determining element. It may utilize any one of the following tone frequencies: 1050, 1200, 1350, 1500, 1650, 1800, 1950, 2100, 2250 or 2400 Hz.



The Encoder – will automatically send a burst of tone the first time the transmitter is keyed (PTT switch closed). Pushing the momentary action TONE button on the module will also key the transmitter and send the desired tone.

This module combines the functions of both the Type 90 Encoder and Decoder. It performs and can be operated like both of the modules described in the foregoing paragraphs. Similarly, one or two relays and pushbuttons may be added as an option for the decoder for external alarm.

The basic Type 99 Tone Decoder module responds to one discrete pair of tone frequencies as an Individual Call. An expanded version provides Individual, Group and Super-Group by responding to two separate pairs of tones.

In all cases, the decoder keeps the speaker muted until the proper set of tones is received. Then, the CALL LED will flash and an alert tone is sounded.

The decoder may also be equipped with optional relays and pushbuttons to operate external alarms such as a horn and/or a light.

The CALL pushbutton is used to reset the decoder after a call or to monitor the channel. Automatic reset or channel monitor may be accomplished by adding an optional hookswitch to the radio's microphone circuit.

This module is useful in performing extra or auxiliary functions. The option is supplied with:

Five single pole, double throw, unmarked pushbuttons.

A sheet of peel-off labels for switch identification.

A wiring harness that terminates in a plug in the backplane on the control unit housing (see "d" in Figure 9).

15 color coded wires, 12-feet long, with a mating plug for the wiring harness.

The "EXT" and the "PA" pushbuttons control four modes of operation. Depressing the "EXT" pushbutton causes the receiver audio to be heard through both the internal and external speakers.

Pushing the "PA" button enables the radio's microphone to key just the PA system through the external speaker. Incoming messages can be heard only through the internal speaker.

With both buttons depressed, the individual modes are combined and the microphone will key just the PA system. When both pushbuttons are not engaged the radio operates in its normal mode.

The module's volume control allows the PA audio output to be set independently of the radio's volume and vice versa. Full PA audio output is 12 watts.

MASTR Mobile "Systems" Control Units

CONTROL DECK MODULES

Four basic "Control" modules are offered to provide a ed and have fluted edges to facilitate adjustment. The power (PWR) switch is a push-push control which is backchoice of control capability. Selection is dictated by the lighted by an amber LED when depressed. The channel number of channels available in the mobile radio (MASTR selectors (rotary wheel or pushbuttons), channel busy II or Executive II) and the need for one or more control deck options. indicator and option pushbuttons also use amber LEDs. The transmit LED is red. The unused positions on the All modules are provided with variable squelch, volume single channel, two channel and the rotary control modules control, separate on/off power switch, channel selector (exare covered with snap-out inserts to enable function cept single channel module), transmit indicator and channel switches to be added. The same is true for vacant positions busy indicator. The volume and squelch controls are recesson Option modules. (1) PUSHBUTTON CONTROL – One Channel The single channel module, of course, should only be used for a single channel radio. The four vacant switch positions (shown by dashed lines in the illustration) may be occupied by any one or all of the Control Deck Options listed below. 0 Two-channel module has two interlocking pushbuttons. Each is (2) PUSHBUTTON CONTROL - Two Channel back-lighted by an LED which will brighten when its button is pushed in. This module has space for the addition of one or two Control Deck Options. Note that this module may not be expanded to the three channels. To increase channel capacity, the two-pushbutton assembly must be replaced by a set of four. (3) PUSHBUTTON CONTROL – Four Channel The four channel module is equipped with four interlocking pushbuttons and each is illuminated by an LED. Since all switch positions are full, there is no space available for options. If a con-trol option is required, the rotary control module should be specified, instead. р 0 (4) ROTARY CONTROL The "rotary" module has space for any one of the regular Control Deck Options or it may be used for Priority Search Lock Monitor Up to Twelve Channels (PSLM) to monitor any two channels of a multiple (up to 12) channel radio. This PSLM option is exclusive to the rotary-type control module. Three PSLM versions are offered. One version has a fixed priority channel; the second has the non-priority channel fixed; and the third alternates the priority and non-priority selection between two channels. In either case, the SRCH pushbutton enables or disables the monitoring function. An LED indicator behind the SRCH pushbutton appears brighter when selected. It increases in The rotary control module may be used for any number of channels, up to 12. However, the rotary channel wheel will be "stopped" so that it may not be moved beyond the number of channels specified. The "stop" may be advanced if additional positions are brilliance when a signal is present on one of the channels being monitored. The light will be steady if it's the priority channel. needed later. It will blink on the non-priority channel.

CONTROL DECK OPTIONS

The following Options may be applied only to the single and two channel "pushbutton" or "rotary" control modules, space permitting. Each provides a back-lighted (LED) pushbutton which brightens when activated.

CHANNEL GUARD MONITOR — used to provide monitoring of Channel Guard protected receivers in lieu of a microphone or hand-set hookswitch.

TWO CHANNEL PSLM – See description in section (4) ROTARY CONTROL.

FIXED SQUELCH – for application involving a radio modified for fixed squelch operation. The variable squelch wheel is replaced with an on/off rotary switch for channel monitoring.

INTERNAL/EXTERNAL SPEAKER – in addition to the pushbutton, an outdoor reentrant speaker, mounting hardware and speaker cable are furnished. With the pushbutton depressed, approximately 90% of the receiver audio goes outside; the remaining 10% can be heard by the internal speaker. This Option is redundant when the (Option Deck) PA module is used.

DUAL CONTROL — provides a switch only. Enables a C-800 or C-900 control unit (with no other options) to be used in a dual control installation.

APPLICATION and GENERAL DATA

DIMENSIONS				COLORS	Moonstone Brown
and for the second	C-800	C-900	Bracket (Assembled)	Case:	
Height (ins./cm.)	3.25/8.26	4.31/10.95	4.5/11.4 (min)	Front Panel:	Ash Beige
Width (ins./cm.)	7.25/18.45	9.31/23.65	7.5/19.2 (min)	Rotary Controls	Grev
Depth (ins./cm.)	7.0/17.8	7.0/17.8	3.0/7.6	Mounting Bracket:	Grev
Weight* (Ibs./kg.)	3,13/1.42	4.75/2.15	1.5/0.68	Mounting Bracket.	Oley
				CONTROL CABLES:	For system voltages

*Less modules. Typical module weighs 0.5 lbs. (0.23 kg.)

ACCESSORY OPTIONS

The basic C-800 or C-900 Control unit is supplied with only a mounting bracket and swivel base. By selecting other digits in its Ordering Nomenclature, the following accessories can be included:

- Transistorized mobile microphones, standard military or noise cancelling.
- Handset and/or hookswitch.
- 8 ohm (indoor) mobile speaker.

Adaptor cable or plug for connecting external tone devices or GE-STAR units.

non-CG mobile or a mobile with CG decode only.

Power/Control cable for a MASTR II or Executive II mobile.

The multiple tone CG Encoder module is compatible with either a

PSLM is incompatible with multiple tone CG Encoders and Decoders

The C-900 series has an Option Bay into which customized devices or controls may be incorporated. The interface board in the Option

Bay is prewired and has pin terminals for connection of add-on

Junction Box for dual control systems.

when installed in MASTR II mobiles.

equipment,

COMPATIBILITY

For proper and complete operation, the control capability of the C-800 or C-900 control module must match the requirements of the radio with which it is used. The radio itself must be modified slightly when used with either the Fixed Squelch, multi-tone Channel Guard, Noise Blanker disable switch and/or Public Address Options.

Because of control conflicts, only one decode option may be specified for C-900 controls.

C-800 or C-900 Control Units are not compatible with "A" Series Executive II mobile radios.

BACK PANEL CONNECTIONS



Figure 8. C-900 Series

Figures 8 and 9 show the rear connection panel of a C-900 and C-800 control unit, respectively. A standard mobile power/control cable plugs into connectors "a". Lugs over the two rows of pins are used to anchor connector hooks for strain relief and to hold the connectors in place.

The microphone cable plugs in to receptacle "b". It is retained by a captive threaded screw running through its center.



Figure 9. C-800 Series

The optional 9-pin Winchester Plug for external tone or signalling devices mounts in location "c".

Cutout "d" is used for the receptacle supplied with the "wild curd" module and/or the external alarm options on a decoder.

The optional Noise Blanker switch installs in the rectangular slot "e".

MOBILE RADIO DEPARTMENT GENERAL ELECTRIC COMPANY . LYNCHBURG, VIRGINIA 24502



(PC07)

or ±24 to 48 VDC.