

# **Maintenance Manual**

**MASTR® III**  
**RF PACKAGE, UHF**  
**380-512 MHz**

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**NOTICE!**

This manual covers Ericsson and General Electric products manufactured and sold by Ericsson Inc.

**NOTICE!**

Repairs to this equipment should be made only by an authorized service technician or facility designated by the supplier. Any repairs, alterations or substitution of recommended parts made by the user to this equipment not approved by the manufacturer could void the user's authority to operate the equipment in addition to the manufacturer's warranty.

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**CONVENTIONAL OPTIONS and ACCESSORIES**

**Programmable Options**

- Transmit Frequencies
- Receive Frequencies
- Channel Spacing
- Channel Guard Digital and Tone
- Channel Guard Disable
- Repeater Disable
- Intercom Function
- Type 90
- DTMF Decode
- Morse Code ID
- Squelch Tail Elimination (STE)
- Carrier Control Timer
- Station Control
- DC Control
- Tone Control
- Repeater
- DC/Repeat
- Tone/Repeat
- 2 or 4 Wire Audio
- Scan

**Additional Options**

- Service Microphone
- Antenna Multicoupler
- 50 Hz Power Supply
- Duplexer
- Antenna Relay (VHF/UHF)
- Combiner
- Isolator
- Squelch Operated Relay
- Remote Controllers
- Battery Standby (VHF/UHF)
- Battery Charger (VHF/UHF)
- Gel Cell Battery (VHF/UHF)
- Voice Guard Encryption
- Aegis Digital

**CONVENTIONAL TONE & DC REMOTE CONTROLLED STATIONS**

**AUDIO (Line to Transmitter)**

Line Terminating Impedance:	600 W
Line Level (Adjustble):	-20 dBm to +7 dBm
Frequency Response:	± 3 dB @ 300-3000 Hz

**TONE CONTROL**

Function Tones:	1050,1150,1250,1350,1450, 1550,1650, 1750,1850,1950 & 2050 Hz
Secur-it Tone & Transmit Tone:	2175 Hz
Transmitted 2175 Hz Tone Level:	20 dB Below Voice
Permissible Control Line Loss @2175 Hz:	30 dB

Continued

**CONVENTIONAL TONE & DC REMOTE CONTROLLED STATIONS - Cont.**

**AUDIO (Receiver-to-Line)**

Audio Amplifier Input Impedance:	10 K $\Omega$
Input Level:	1 V RMS (For 5 kHz Deviation)
Output Impedance to Line:	600 $\Omega$
Output Level to Line Voice (1 kHz ref):	+7 dBm (Adjustable)
Tone (1 kHz ref):	+7 dBm (Ref. 7 dBm)
Frequency Response:	+1 dB and -3dB @ 300-3000 Hz
Hum and Noise, Noise Squelch:	-55 dB (Ref. 7 dBm)
Tone Squelch:	-30 dB (Ref. 7 dBm)
<b>DC CONTROL Control Control Currents:</b>	-2.5, $\pm$ 6 & $\pm$ 11 mA
Line Loop Resistance (maximum):	11 K $\Omega$ (Includes 3K Termination)

**REGULATORY DATA EDACS and CONVENTIONAL**

FCC FILING DATA (for cabinet or open rack mounting)				
FREQUENCY BAND	POWER OUTPUT (Internally Adjustable)	FREQ. STABILITY AND MODULATION TYPE	APPLICABLE TO FCC RULES PART NUMBERS	FCC FILLING NUMBER
403-430	45 to 90 W	(Freq. Mod. PLL Exc.) 1.0 PPM	22,90,80,74	AXATR-307-A
425-450	45 to 90 W	(Freq. Mod. PLL Exc.) 1.0 PPM	22,90,80,74	AXATR-307-A2
450-470	50 to 100W	(Freq. Mod. PLL Exc.) 1.0 PPM	22,90,80,74	AXATR-307-B2
470-494 492-512	45 to 90 W	(Freq. Mod. PLL Exc.) 1.0 PPM	22,90,80,74	AXATR-307-C2 AXATR-307-D2
DOC FILING DATA				
FREQUENCY BAND	TYPE NUMBER		APPLICABLE SPEC	
403-430	TR-307		RSS-119	
425-450	TR-307		RSS-119	
450-470	TR-307		RSS-119	
470-494, 492-512	NA		NA	

**GENERAL**

CABINET	INDOOR CABINET (Floor Mount)	
	37" (CNV)	69"
SIZE [in. (mm)]		
Height:		
Width:	37.0 (940)	69.1 (1750)
Depth:	21.5 (550)	23.1 (590)
Weight (min) [(lb. (Kg))]	18.25 (460)	21.0 (533)
Continuous Duty	150 (68)	300 (136)
Packed , Domestic Shipping	165 (75)	317 (147)
Number of Rack Units	17	33
Maximum Units w/Power Supply	2	3
Maximum Units w/o Power Supply	2	4

NOTE: One Rack Unit equals 1.75 inches, Stations occupy 8 rack units of cabinet space.

SERVICE SPEAKER:	1 Watt @ 8Ω
SERVICE MICROPHONE:	Transistorized Dynamic
DC 5A @ 120 VAC or 3A @ 230 VAC	
DUTY CYCLE (EIA) Continuous:	Transmit/Receive - 100%
AMBIENT TEMPERATURE:	-30°C to +60°C
(or full spec performance per EIA)	(-22°F to +140°F)
HUMIDITY (EIA):	90% @ 50°C (122°F)
INPUT POWER SOURCE:	120 VAC (± 20%) or
Optional:	230 VAC (± 15%), 50 Hz
Standby Battery Source:	13.8 VDC, 100 AH (min.)
ANTENNA CONNECTIONS:	Type N
LENGTH OF AC POWER CABLE:	10 ft (3048mm)
METERING:	Provided through Handset or TQ0619 Utility Software.
ALTITUDE	
Operable:	Up to 15,000 ft (4,570 m)
Shipable:	Up to 50,000 ft (15,250 m)

SOURCE POWER DRAIN	UHF					
	380-400	403-430	425-450	450-470	470-494	492-512
Frequency Range(MHz)						
AC Input Power:	5A @ 120 VAC or 3A @ 230 VAC					
DC Input Power: <u>VDC</u>						
Tx (full / half power): 13.8	33/25A	33/25A	33/25A	33/25A	33/25A	33/25A
Rx only: 13.8	2 A	2 A	2 A	2 A	2 A	2 A
Tx (full / half power): 26.4						
EDACS Applications: 13.8	2 A	2 A	2 A	2 A	2 A	2 A

**TRANSMITTER**

	UHF					
FREQUENCY RANGE (MHz)	380-400	403-430	425-450	450-470	470-494	492-512
RATED POWER OUTPUT (Watts):	75	90	90	100	90	90
RF OUTPUT IMPEDANCE (W):	50	50	50	50	50	50
CONDUCTED SPURIOUS & HARMONIC EMISSION (dBm):	-36	-36	-36	-36	-36	-36
FREQUENCY STABILITY (%):	±0.0001	±0.0001	±0.0001	±0.0001	±0.0001	±0.0001
MODULATION DEVIATION (kHz):	0 to ± 5	0 to ± 5	0 to ± 5	0 to ± 5	0 to ± 5	0 to ± 5
16F3 & 16F9 20F5Y & 20F9Y (VHF & UHF)						
FM NOISE (dB):	-55	-55	-55	-55	-55	-55
CHANNEL STEPS (kHz)	6.25	6.25	6.25	6.25	6.25	6.25
FREQUENCY SPREAD Full Spec (MHz)	20	22	25	20	24	20

AUDIO DISTORTION (@ 1 kHz): Less than 3%

NUMBER OF CHANNELS (Conventional): up to 16

AUDIO RESPONSE (pre-emphasis): Within +1 and -3 dB of 6dB/octave, 300 to 3000 Hz per EIA.

NOTE: Rated power output is measured at the transmitter power amplifier output connector per FCC Type Acceptance filling information. Any customer- required optional items such as power measuring devices and/or duplexers will introduce loss between the transmitter output connector and the station cabinet output connector. This loss will reduce the available power at the station connector.

**RECEIVER**

	UHF					
FREQUENCY RANGE (MHz)	380-400	403-430	425-450	450-470	470-494	492-512
RF INPUT IMPEDANCE (W):	50	50	50	50	50	50
CHANNEL SPACING (kHz):	12.5/25	12.5/25	12.5/25	12.5/25	12.5/25	12.5/25
SENSITIVITY (dBm) EIA 12 dB SINAD:	-115 (0.40 µV)	-116 (0.35 µV)	-116 (0.35 µV)	-116 (0.35 µV)	-116 (0.35 µV)	-116 (0.35 µV)
Threshold Squelch (dBm):	-118 (0.28 µV)	-119 (0.25 µV)	-119 (0.25 µV)	-119 (0.25 µV)	-119 (0.25 µV)	-119 (0.25 µV)
SELECTIVITY EIA 2-Signal (dB) 12.5 kHz: 25 kHz:	-80 -90	-80 -90	-80 -90	-80 -90	-80 -90	-80 -90

Continued

**RECEIVER - Cont.**

	UHF					
	380-400	403-430	425-450	450-470	470-494	492-512
FREQUENCY RANGE (MHz)						
FREQUENCY STABILITY (%):	±0.0001	±0.0001	±0.0001	±0.0001	±0.0001	±0.0001
SIGNAL DISPLACEMENT BANDWIDTH (kHz):	±2	±2	±2	±2	±2	±2
INTERMODULATION (dB)						
12.5 kHz:	-80	-80	-80	-80	-80	-80
25 kHz:	-85	-85	-85	-90	-90	-90
30 kHz:				-85		
ETSI						
SPURIOUS & IMAGE REJECTION (dB):	-100	-100	-100	-100	-100	-100
FREQUENCY SPREAD						
Full Specs. (MHz):	2.0	2.0	2.0	2.0	2.0	2.0
3 dB Degradation in Sensitivity (MHz):	3.0	3.0	3.0	3.0	3.0	3.0

AUDIO RESPONSE (de-emphasis):

Within +2 and -8 dB of 6 dB/octave  
(@ Local Speaker), 300 to 3000 Hz per EIA.

Within +1 and -3 dB of 6 dB/octave  
(@ Line Output), 300 to 3000 Hz per EIA.

AUDIO OUTPUT:

1 Watt at less than 3% distortion @ 1000 Hz,  
25 kHz Channel

**MODULE NUMBERS**

TRANSMIT SYNTHESIZER (450-470 MHz) .....	19D902780G3
(425-450 MHz) .....	19D902780G7
(403-425 MHz, 410-430MHz) .....	19D902780G6
(380-400 MHz) .....	19D902780G8
(470-494 MHz) .....	19D902780G9
(492-512 MHz) .....	19D902780G10
RECEIVE SYNTHESIZER (450-470 MHz, 403-425 MHz, 410-430 MHz) .....	19D902781G3
(425-450 MHz, 470-494 MHz) .....	19D902781G7
(380-400 MHz) .....	19D902781G8
(492-512 MHz) .....	19D902781G10
RX FRONT END MODULE (450-470 MHz) .....	19D902782G3
(425-450 MHz) .....	19D902782G7
(403-425 MHz) .....	19D902782G6
(410-430 MHz) .....	19D902782G11
(380-400 MHz) .....	19D902782G8
(470-494 MHz) .....	19D902782G9
(492-512 MHz) .....	19D902782G10
IF MODULE .....	19D902783G1
(470-494 MHz, 492-512 MHz) .....	19D902783G7

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## MODULE NUMBERS - Cont.

POWER AMPLIFIER	(450-470 MHz).....	19D902797G3
	(425-450 MHz).....	19D902797G7
	(403-425 MHz).....	19D902797G6
	(410-430 MHz).....	19D902797G11
	(380-400 MHz).....	19D902797G8
	(470-494 MHz).....	19D902780G9
	(492-512 MHz).....	19D902780G10
LOW PASS FILTER	.....	19D902856G1
	(470-512 MHz).....	19D902780G9
ANTENNA SWITCH	.....	19B235897P2
DUPLEXER	(440-470 MHz).....	344A4047P1

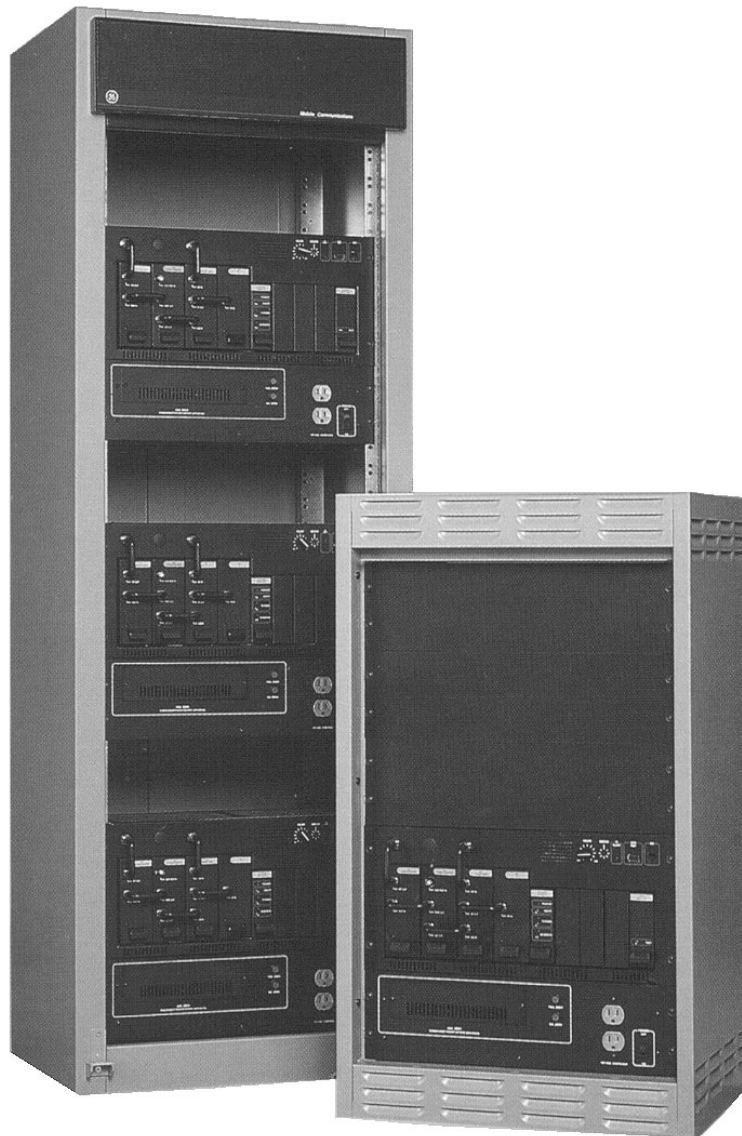
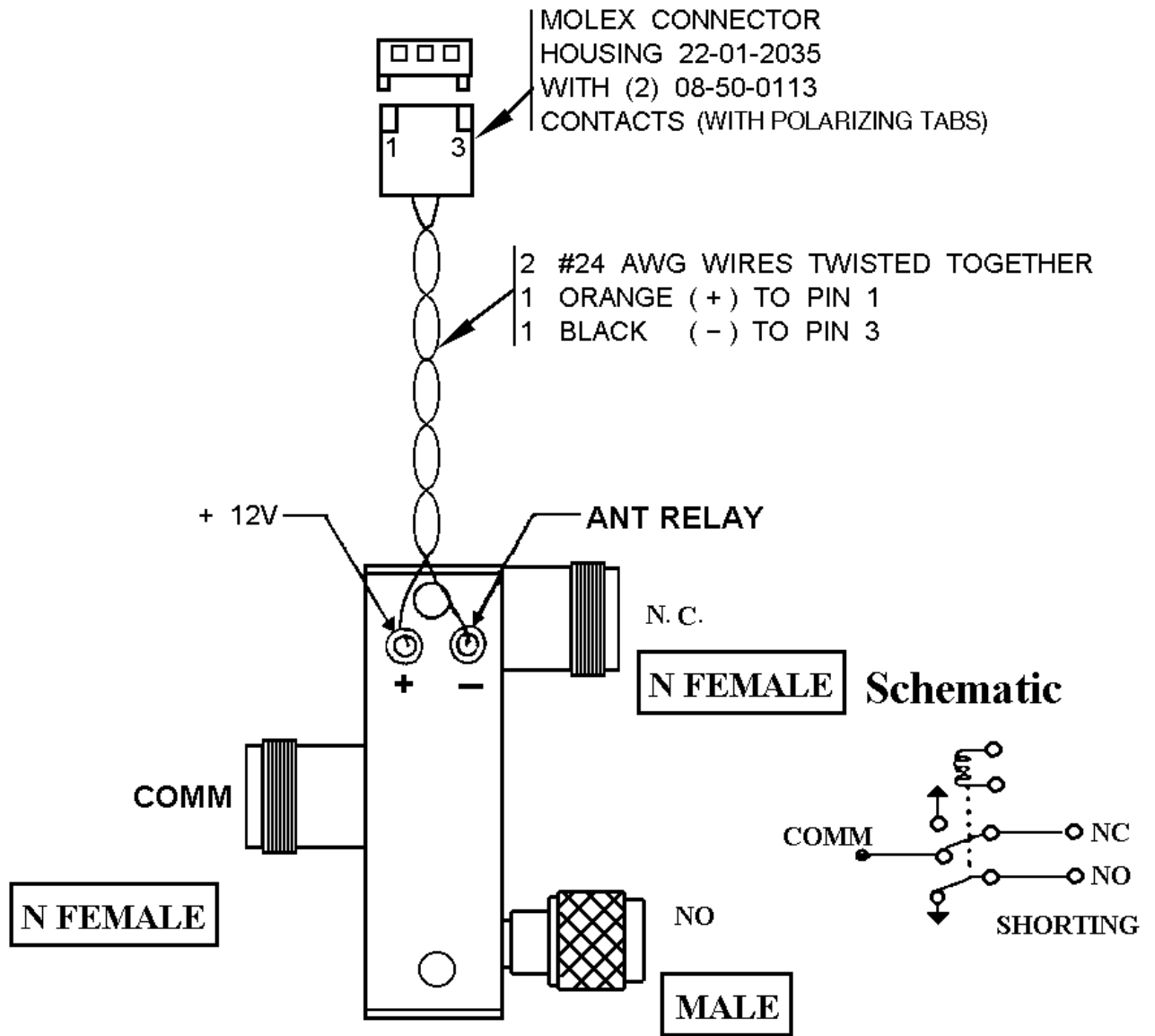


Fig 1 - 69" & 37" Cabinet Mount





ANTENNA SWITCH  
19B235897P2

