TECHNICAL MANUAL

for

INDEPENDENT AGC RECEIVING SYSTEM

MSG(A)-1

THE TECHNICAL MATERIEL CORPORATION

MAMARONECK, N.Y. OTTAWA, ONTARIO

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NOTICE

THE TECHNICAL MATERIEL CORPORATION
COMMUNICATIONS ENGINEERS
700 FENIMORE ROAD MAMARONECK, N. Y.

Warranty

The Technical Materiel Corporation, hereinafter referred to as TMC, warrants the equipment (except electron tubes*, fuses, lamps, batteries and articles made of glass or other fragile or other expendable materials) purchased hereunder to be free from defect in materials and workmanship under normal use and service, when used for the purposes for which the same is designed, for a period of one year from the date of delivery F.O.B. factory. TMC further warrants that the equipment will perform in a manner equal to or better than published technical specifications as amended by any additions or corrections thereto accompanying the formal equipment offer.

TMC will replace or repair any such defective items, F.O.B. factory, which may fail within the stated warranty period, PROVIDED:

1. That any claim of defect under this warranty is made within sixty (60) days after discovery thereof and that inspection by TMC, if required, indicates the validity of such claim to TMC's satisfaction.
2. That the defect is not the result of damage incurred in shipment from or to the factory.
3. That the equipment has not been altered in any way either as to design or use whether by replacement parts not supplied or approved by TMC, or otherwise.
4. That any equipment or accessories furnished but not manufactured by TMC, or not of TMC design shall be subject only to such adjustments as TMC may obtain from the supplier thereof.

Electron tubes* furnished by TMC, but manufactured by others, bear only the warranty given by such other manufacturers. Electron tube warranty claims should be made directly to the manufacturer of such tubes.

TMC's obligation under this warranty is limited to the repair or replacement of defective parts with the exceptions noted above.

At TMC's option any defective part or equipment which fails within the warranty period shall be returned to TMC's factory for inspection, properly packed with shipping charges prepaid. No parts or equipment shall be returned to TMC, unless a return authorization is issued by TMC.

No warranties, express or implied, other than those specifically set forth herein shall be applicable to any equipment manufactured or furnished by TMC and the foregoing warranty shall constitute the Buyers sole right and remedy. In no event does TMC assume any liability for consequential damages, or for loss, damage or expense directly or indirectly arising from the use of TMC Products, or any inability to use them either separately or in combination with other equipment or materials or from any other cause.

*Electron tubes also include semi-conductor devices.

PROCEDURE FOR RETURN OF MATERIAL OR EQUIPMENT

Should it be necessary to return equipment or material for repair or replacement, whether within warranty or otherwise, a return authorization must be obtained from TMC prior to shipment. The request for return authorization should include the following information:

1. Model Number of Equipment.
2. Serial Number of Equipment.
3. TMC Part Number.
4. Nature of defect or cause of failure.
5. The contract or purchase order under which equipment was delivered.

PROCEDURE FOR ORDERING REPLACEMENT PARTS

When ordering replacement parts, the following information must be included in the order as applicable:

1. Quantity Required.
2. TMC Part Number.
3. Equipment in which used by TMC or Military Model Number.
4. Brief Description of the Item.
5. The *Crystal Frequency* if the order includes crystals.

PROCEDURE IN THE EVENT OF DAMAGE INCURRED IN SHIPMENT

TMC's Warranty specifically excludes damage incurred in shipment to or from the factory. In the event equipment is received in damaged condition, the carrier should be notified immediately. Claims for such damage should be filed with the carrier involved and not with TMC.

All correspondence pertaining to Warranty Claims, return, repair, or replacement and all material or equipment returned for repair or replacement, within Warranty or otherwise, should be addressed as follows:

THE TECHNICAL MATERIEL CORPORATION
Engineering Services Department
700 Fenimore Road
Mamaroneck, New York

CHANGE NO. 1 MSG(A)-1 (Sheet 1 of 4)

INSTRUCTION BOOK CHANGE NOTICE

Date August 11, 1964

Manual affected: Independent AGC Receiving System, MSG(A)-1 IN -340

The following chart provides a list of power interconnection points of the various modular units comprising the MSG(A)-1 system.

MSG(A)-1 Interconnection Table

MSA-1 (1)			HFP-1	
Connector	Pin		Connector	Pin
J6515	A	115 VAC Interconnect	J8005	U
	B	115 VAC Interconnect	J8007	C
	C	+200 v IF	J8005	K
	D	Ground	J8009	L
	E	-105 v	J8005	H
	F	AGC Combined	J8009	J
	H	6.3 v Unbal.	J8005	W
	J	6.3 v Unbal.	J8005	Z
	K	Grnd. Unbal.	J8005	X
	S	Grnd. Unbal.	J8005	Y
	L	6.3 v Bal. (B_2)	J8005	M
	T	6.3 v Bal. (B_2)	J8005	N
	M	6.3 v Bal. (B_1)	J8005	S
	U	6.3 v Bal. (B_1)	J8005	R
	N	6.3 v Bal. (A_1)	J8006	A
	V	6.3 v Bal. (A_1)	J8006	B
	P	6.3 v Bal. (A_2)	J8006	C
	W	6.3 v Bal. (A_2)	J8006	D
	a	115 VAC Fan	J8009	A
	b	115 VAC Fan	J8009	B
	R	+200 v Audio	J8007	K

MSA-1 (2)			HFP-1	
Connector	Pin		Connector	Pin
J6515	A	115 VAC Interconnect	J8010	C
	B	115 VAC Interconnect	J8010	P
	C	+200 v IF	J8010	K
	D	Ground	J8010	L

SHOULD ADDITIONAL COPIES OF THIS CHANGE NOTICE BE REQUIRED, PLEASE CONTACT:

THE TECHNICAL MATERIEL CORP., 700 Fenimore Road, Mamaroneck, New York

Attn.: Director of Eng. Services.

INSTRUCTION BOOK CHANGE NOTICE

Date August 11, 1964

Manual affected: Independent AGC Receiving System, MSG(A)-1 IN -340

MSG(A)-1 Interconnection Table (cont)

MSA-1 (2)			HFP-1	
Connector	Pin		Connector	Pin
J6515	E	-105 v	J8009	H
	F	AGC Combined	J8010	M
	H	6.3 VAC Unbal.	J8007	R
	J	6.3 VAC Unbal.	J8007	E
	K	Grnd. Unbal.	J8007	P
	S	Grnd. Unbal.	J8007	F
	L	6.3 v Bal. (B_2)	J8006	H
	T	6.3 v Bal. (B_2)	J8006	J
	M	6.3 v Bal. (B_1)	J8006	M
	U	6.3 v Bal. (B_1)	J8006	N
	N	6.3 v Bal. (A_1)	J8006	R
	V	6.3 v Bal. (A_1)	J8006	P
	P	6.3 v Bal. (A_2)	J8009	C
	W	6.3 v Bal. (A_2)	J8009	D
	a	115 VAC Fan	J8010	A
	b	115 VAC Fan	J8010	B
	R	+200 v Audio	J8008	B

MNF-1 (1)			MFP-1	
Connector	Pin		Connector	Pin
J6914	K	+200 v	J7003	K
	L	Grnd.		L
	F	Grnd. Fil.		F
	E	6.3 v Fil.		E
	P	Grnd. Fil.		D
	R	6.3 v Fil.		C

INSTRUCTION BOOK CHANGE NOTICE

Date August 11, 1964

Manual affected: Independent AGC Receiving System, MSG(A)-1 IN -340

MSG(A)-1 Interconnection Table (cont)

MNF-1 (2)			MFP-1	
Connector	Pin		Connector	Pin
J6914	K	+200 v	J7002	K
	L	Grnd.		L
	F	Grnd. Fil.		F
	E	6.3 v Fil.		E
	P	Grnd. Fil.		Y
	R	6.3 v Fil.		Z

HFP-1			MFP-1	
Connector	Pin		Connector	Pin
J8008	J	6.3 VAC	J7002	A

MCG-1 (1)			HFP-1		MCG-1 (2)	
Connector	Pin		Connector	Pin	Connector	Pin
J6015	A	6.3 VAC Fil.	J8007	A		
	B	Grnd.	J8007	D		
	M	6.3 VAC Oven			J6015	M
	H	6.3 VAC Oven			J6015	H
	K	+200 v	J8005	K		
	F	Grnd.	J8005	L		
	C	+28 VDC			J6015	C
	D	Grnd.			J6015	D
	N	115 VAC Oven			J6015	N
	R	115 VAC Oven			J6015	R

INSTRUCTION BOOK CHANGE NOTICE

Date August 11, 1964

Manual affected: Independent AGC Receiving System, MSG(A)-1 IN -340

MSG(A)-1 Interconnection Table (cont)

MCG-1 (2)			HFP-1		MPS	
Connector	Pin		Connector	Pin	Connector	Pin
J6015	A	6.3 VAC Fil.	J8006	E		
	B	Grnd.	J8006	F		
	M	6.3 VAC Oven	J8005	C		
	H	6.3 VAC Oven	J8005	D		
	K	+200 v	J8008	K		
	F	Grnd.	J8006	L		
	C	+28 VDC			J6080	C
	D	Grnd.			J6080	A
	N	115 VAC Oven			J6080	N
	R	115 VAC Oven			J6080	R

RECORD OF CORRECTIONS MADE

Change No.	Date of Change	Date Entered	Entered By

TABLE OF CONTENTS

SECTION 1- GENERAL INFORMATION

LIST OF ILLUSTRATIONS

SECTION 2 - INSTALLATION

SECTION 3 - OPERATOR'S SECTION

LIST OF TABLES

SECTION 1 - GENERAL INFORMATION

SECTION 2 - INSTALLATION

SECTION 3 - OPERATOR'S SECTION

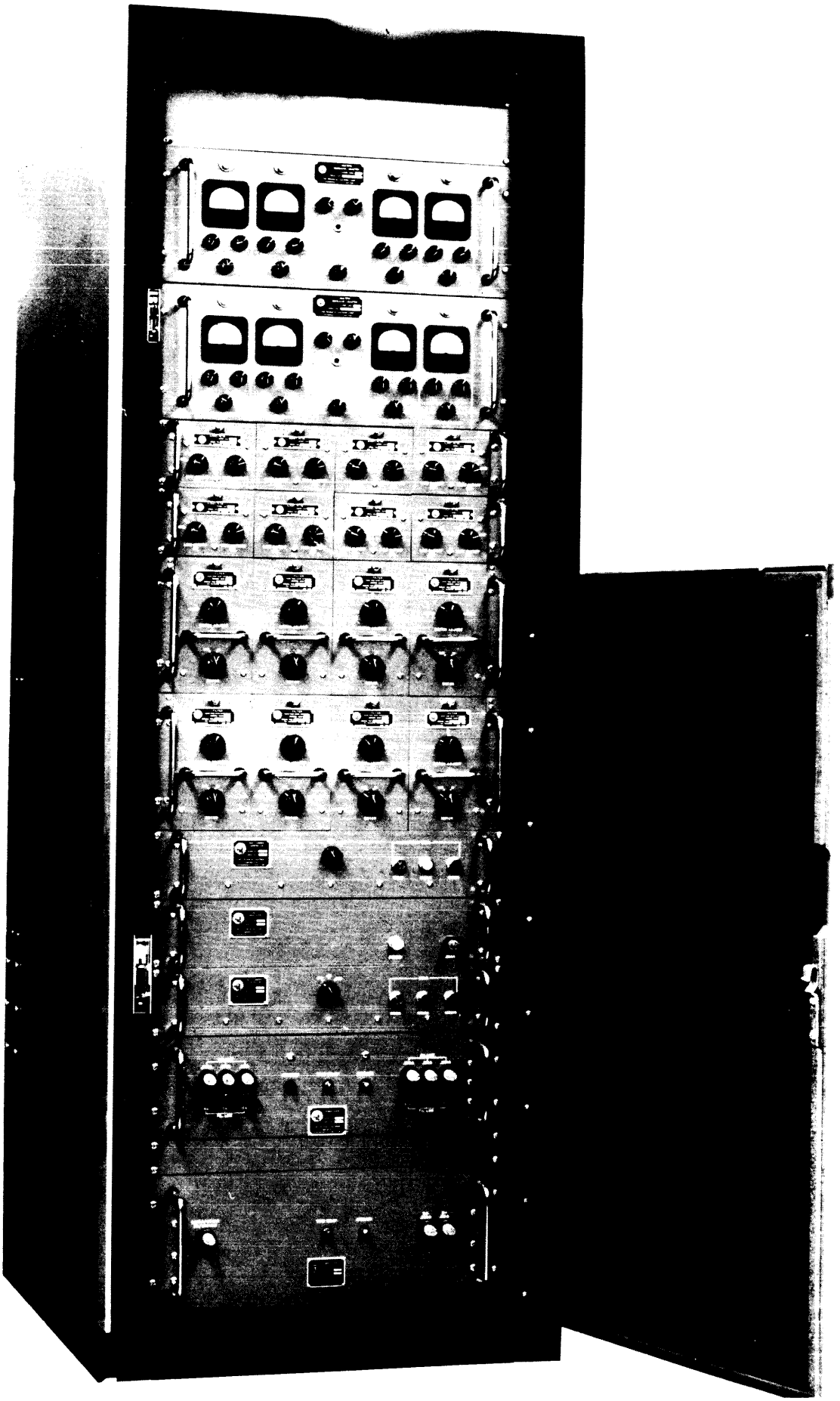


Figure 1-1. Independent AGC Receiving System MSG(A)-1

SECTION 1

GENERAL INFORMATION

1-1. GENERAL DESCRIPTION

The Model MSG(A)-1 Independent AGC Receiving System (figure H) is a four-channel single sideband suppressed multiple carrier demultiplexer used with the DDR family of diversity receivers. Basically, its made up of two identical demultiplexing systems each with its own audio and intermediate-frequency filters.

Units comprising the MSG(A)-1 are housed in a standard 19-inch relay rack which makes the system convenient for mobile applications as well as for permanent installations. All meters and controls are located on the front panels of the units, while all electrical connections are made to the rear of the units. The cooling system employs a positive filtered forced-air cooling system using squirrel cage blowers with the rack. Washable air filters are used to filter out external dust. The rack contains the three power supplies necessary to its operation.

1-2. DESCRIPTION OF UNITS

a. GENERAL - Figure 1-2 shows the locations of the various units within the rack. The paragraphs below give a brief description of these units.

b. MULTIPLE SIDEBAND ADAPTER MODEL MSA-1 - There are two of these units in the MSG(A)-1. Its purpose is to demultiplex the 1.75-mc i-f input from an associated DDR-5 Receiver and provide four discrete audio outputs.

c. MULTIPLE AUDIO FILTER MODEL MAF-1 - These units (there are two of them) are passive filter drawers which provide large selections of audio bandwidths in order to eliminate particular types

of interference due to terrain, environment, or local transmitters. Each channel has its own hi-pass and lo-pass filters thus providing adjustable low and high cutoff points within a channel.

d. MULTIPLE NOTCH FILTER MODEL MNF-1 - There are two MNF-1's in the MSG(A)-1 system. The MNF-1 is a fixed crystal band suppressor unit providing up to four plug-in notch filters. Each notch filter provides at least 50-db attenuation at ± 10 cycles to an interfering signal appearing within its i-f channel.

e. MULTIPLEX CARRIER GENERATOR MODEL MCG-1 - There are two of these units in the MSG(A)-1. The MCG-1 generates the 2-mc i-f translation frequency along with 250-kc and 256.290 kc and 243.710 kc demultiplexing signals. The 250-kc signal is used to demultiplex the inboard carriers in the MSA-1 unit while the two side band carriers are used to demultiplex the outboard carriers in the same unit.

f. POWER SUPPLY MODEL MPS-1 - This power supply provides the 25-vdc regulated voltage used in the sideband crystal standard (Z6001) at each Multiple Carrier Generator MCG-1.

g. POWER SUPPLY MODEL HFP-1 - Provides regulated B+ and bias voltages along with filament voltages for both Multiple Sideband Adapter MSA-1 Units.

h. POWER SUPPLY MODEL MFP-1 - This power supply provides the 200 vdc B+ and 6.3-vac filament voltages for the two Multiple Notch Filters MNF-1.

1-3. TECHNICAL CHARACTERISTICS

INPUT FREQUENCY	1.75 mc or 455 kc
INPUT IMPEDANCE	50 ohms nominal
CARRIER REINSERTION	1. Oven controlled crystal oscillator. 2. Reconstructed carrier from AFC 3. From HFS-1 synthesizer
INPUT VOLTAGE RANGE	0.3 to 300 millivolts
UNWANTED SIDEBAND REJECTION	Undesired sideband, removed more than 250 cps from the carrier, are suppressed a minimum of 60 db.
INTERMODULATION	Intermodulation products are down 60 db from the maximum tone in the desired sideband as a result of two signals in the unwanted sideband.
SELECTIVITY	No less than 20 db of attenuation to the carrier frequency as a result of sideband selection filters.
IF BANDWIDTHS	Nominal 3 kc
STABILITY	Stability is a function of the operating modes as follows: 1. Synthesized operation - 1 part in 10^8 2. AFC operation - resultant audio output within 1 cycle of transmitted intelligence 3. Crystal control - at least 1 part in 10^6
AGC CHARACTERISTICS	Fast attack time, the decay time is variable from 1 to 10 seconds by front panel control on each channel.
MONITORING	A monitoring circuit is provided to permit headphone monitoring of any audio channel without affecting the audio output (line) circuits.

LAST SYMBOLS		MISSING SYMBOLS	
C6050	S6001	R6060	
CR6003	T6001	R6059	
I[illegible]	V6003		
FL6002	Y6003		
HR6002	Z6003		
J6015			
L6006			
R6065			

+200 V

L6001 2.5 MH

R6005 4.7K-2W

C6005 .1

C6006 .1

C6007 .1

C6008 4.5-25 μμf

C6001 10 μμf

R6001 10K

R6004 22K

R6003 6.8K

R6006 15K

C6009 .1

T6001

RED

BRN

YEL

BLK

BLU

J6003 HEATER LAMP

6.3 VAC

OVEN Z6003

Y6003 250 KC

HR6003

V6001 6EU8 OSC AMPL 250 KC

R6002 100K

C6003 5μμf

C6004 5μμf

L6002 10 MH

C6043 .1

R6007 150

J6002 HEATER LAMP

OVEN Z6002

Y6002 2 MC

HR6002

C6010 4.5-25 μμf

C6047 10μμf

R60 10K

+200 V

C6041 .1

R6015 22K

R6017 6.8K

R6063 100K

R6019 22K

R6022 100K

R6025 47K

R6028 100K

R6029 22K

R6032 100K

R6037 15K

C6030 1.0

L6005 47MH

C6021 .1

C6019 .1

V6003 6BA6 AMPL

C6023 47μμf

CR6001 IN463

V6004 6AS6 4:1 DIVIDER

C6024 5μμf

R6024

R6061 1K

R6026 120K

C6048 [illegible] PF

C6025 [illegible]μμf

R6027 1.8 MEG

R6023 3.3K

R6021 12K

C6020 .02

R6016 4.7K

R6018 1K

C6022 .1

R6062 2.2 MEG

R6020 32K

CR6002 IN463

V6005 6AS6 4:1 DIVIDER

C6026 47μμf

R6034 2.2 MEG

R6035 1K

R6038 150K

C6050 7-45 μμf

R6030 82K

R6031 12K

R6033 3.3K

C6027 .1

R6036 22K

L6006 50 MH

C6028 .02

R6039 120K

J6001 HEATER LAMP

R6065 22K

NE-51H

XTAL OVENS ONLY 6.3 VAC

J6001 100.64 KC

HR6001

AMPL

OVEN Z6001

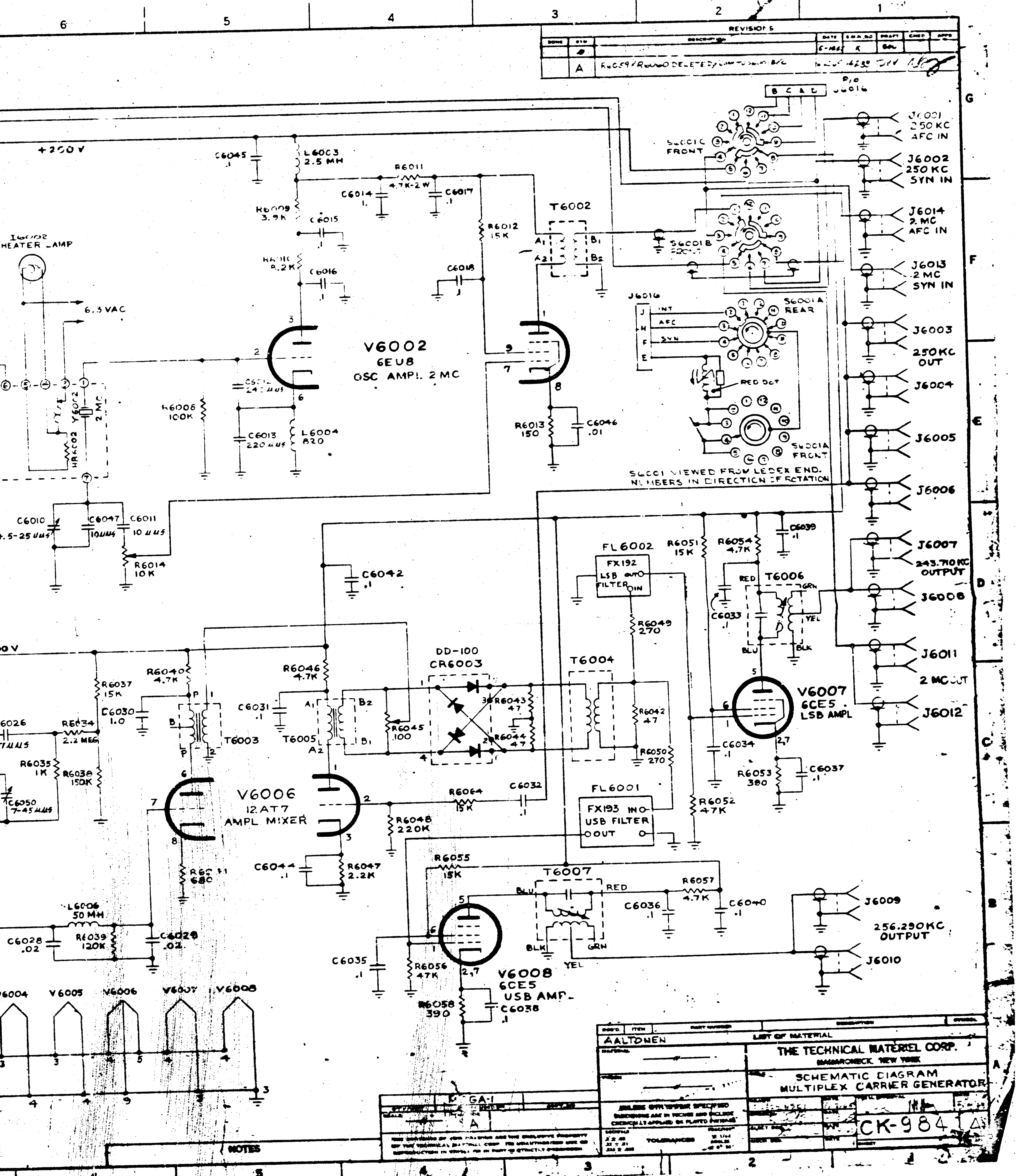
V6001 V6002 V6003 V6004 V6005 V6006

J6015

K D C R N H M F A B P

D+ 200V | +28 VDC | 115 VAC | GRD

11 10 9 8 7 6


REVISIONS
A
R6059/R6060 DELETED
+200 V
I6002 HEATER LAMP
6.3 VAC
C6045 .1
L6003 2.5 MH
R6011 4.7K-2 W
C6014 1.
C6017 .1
R6009 3.9K
C6015 .1
R6010 8.2K
C6016 .1
R6012 15K
C6018
T6002
V6002
6EU8
OSC AMPL 2 MC
Y6002 2 MC
R6006 100K
C6013 220 uuf
L6004 820
R6013 150
C6046 .01
C6010 4.5-25 uuf
C6047 10uuf
C6011 10 uuf
R6014 10K
C6042 .1
S6001C FRONT
S6001B FRONT
S6001A REAR
S6001A FRONT
P/O J6016
J6016
INT
AFC
SYN
RED DOT
S6001 VIEWED FROM LEDEX END.
NUMBERS IN DIRECTION OF ROTATION
J6001 250 KC AFC IN
J6002 250 KC SYN IN
J6014 2 MC AFC IN
J6013 2 MC SYN IN
J6003
250 KC OUT
J6004
J6005
J6006
J6007
243.710 KC OUTPUT
J6008
J6011
2 MC OUT
J6012
FL6002
FX192 LSB FILTER
OUT
IN
R6051 15K
R6054 4.7K
C6039 .1
T6006
RED
GRN
YEL
BLU
BLK
C6033 .1
R6049 270
T6004
R6042 47
R6050 270
V6007
6CE5
LSB AMPL
C6034 .1
R6053 380
C6037 .1
R6052 47K
FL6001
FX193 USB FILTER
DD-100
CR6003
R6043 47
R6044 47
R6045 100
T6005
T6003
R6040 4.7K
R6046 4.7K
R6037 15K
C6030 1.0
C6031 .1
C6026
R6034 2.2 MEG
R6035 1K
R6038 150K
C6050 7-45 uuf
V6006
12AT7
AMPL MIXER
R6064 15K
C6032 .1
R6048 220K
C6044 .1
R6047 2.2K
R6041 680
L6006 50 MH
R6039 120K
C6028 .02
C6029 .02
R6055 15K
T6007
C6036 .1
R6057 4.7K
C6040 .1
C6035 .1
R6056 47K
V6008
6CE5
USB AMP
R6058 390
C6038 .1
J6009
256.290 KC OUTPUT
J6010
V6004
V6005
V6006
V6007
V6008
NOTES
GA-1
A
AALTONEN
LIST OF MATERIAL
THE TECHNICAL MATERIEL CORP.
MAMARONECK, NEW YORK
SCHEMATIC DIAGRAM
MULTIPLEX CARRIER GENERATOR
TOLERANCES
CK-984
A

1-3. TECHNICAL CHARACTERISTICS (Cont)

AUDIO OUTPUTS - - - - - - - - - - - 0 to 10 milliwatts into balanced and center tapped 600 ohm audio per channel.

AUDIO RESPONSE - - - - - - - - - - The amplitude response of each audio channel is ± 1.5 db over the frequency range of 50 to 10,000 cps.

METERING - - - - - - - - - - - - - Independent VU meters are provided to monitor each 600 ohm audio channel.

AF DISTORTION - - - - - - - - - - - Intermodulation products better than 50 db below full output through the audio channel.

HUM LEVEL - - - - - - - - - - - - - 50 db below full audio output

NOTCH BAND REJECTION - - - - - - ± 82 cps at 1 db down
± 10 cps at 60 db down

NOTCH TUNING - - - - - - - - - - - ± 1.5 kc, each channel

AUDIO FILTER IMPEDANCE - - - - - 1000 ohms

AUDIO FILTER CUTOFF FREQUENCIES - 100, 250, 500, 1000, and 2500 cps

ENVIRONMENT - - - - - - - - - - - - Continuous duty between 0 and 50°C and any value of humidity up to 90%.

1-4. EQUIPMENT SUPPLIED

Table 1-1 lists the equipment supplied with the MSG(β)-1 along with physical dimensions and weights.

TABLE 1-1. EQUIPMENT SUPPLIED

Nomenclature	Quantity	Dimensions			Weight (lbs)
		Height	Width	Depth	
Multiple Sideband Adapter Model MSA-1	2	7	19	17	30
Multiple Notch Filter Model MNF-1	2	7	19	14	30
Multiple Audio Filter Model MAF-1	2	3-1/2	19	14	20

TABLE 1-1. EQUIPMENT SUPPLIED (Cont)

Nomenclature	Quantity	Dimensions			Weight (lbs)
		Height	Width	Depth	
Multiplex Carrier Generator MCG-1	2	3-1/2	19	12	8
Power Supply Model MFP-1	1		19		
Power Supply Model HFP-1	1	5-1/4	19	18	67
Power Supply Model MPS-1	1		19		
RAK 21B1	1	69	24-5/8	29-15/16	350

SECTION 2

INSTALLATION

2-1 Unpacking and Handling.

The individual units of the MSG (A)-1 are removed from the rack and packed in seperate cases. Consult the packing list for the contents of each crate. Gross shipping weight of the cases and contents is 1,399 pounds. Inspect the packing cases for possible damage when they arrive at the operating site. With respect to equipment damage for which the carrier is liable, the Technical Materiel Corporation will assist in describing methods of repair and furnishing of replacement parts.

2-2 POWER REQUIREMENTS.

All units leave the factory wired for 115 volt, 50/60 cycle operation. Change may be made to 230 volt, 50/60 cycle operation by making minor wiring changes. Consult the installation section of the individual modular-unit manuals for wiring change information.

CAUTION

> If 230 volt, 50/60 cycle operation is used, all line fuses must be reduced to one half their rated current values to assure adequate circuit protection. Regulated and high voltage fuses remain the same with either line voltage.

Power cabling of sufficient size to provide 15 amperes at 115 vac, single phase, is adequate. For information concerning the connection of the power cable refer to paragraph 2-3 c.

2-3 INSTALLATION

a. LOCATION OF UNIT. Before attempting to install the MSG (A)-1, ensure that adequate power (paragraph 2-2) is available. Normally, the MSG (A)-1 is located next to its associated DDR-5 receiver but may be located at a conveinent remote location. After unpacking and inspecting the rack place it in its operating location. It is advisable to do this while the modular units are not installed because the added weight of the assembled receiver will make movement more difficult. Figure 2-1 is a dimensional outline drawing for the MSG (A)-1. Sufficient space to open front and rear cabinet doors should be considered when choosing a operating location. The front door extends 19-3/4 inches from the cabinet and the rear door extends 19-1/2 inches from the cabinet when opened. The MSG (A)-1 has self contained squirrel cage blowers for cooling; air intakes for the blowers are located at the lower rear of the cabinet, and air exhaust is through openings in the top of the cabinet. Air intake and exhaust ports should be kept clear to assure adequate heat dissipation.

b. INSTALLATION of UNITS.-The cabinet is equipped with tracks that attach to slide michanisms of the modular units. Figure 2-2 shows the location of the units within the cabinet. Like units are identified with letters A and B at the end of their serial numbers. As shown in figure 2-2 the A unit is mounted above the B unit. To install any modular unit proceed as follows·

(1) Untape or unstrap cable assemblies and other items that are secured to the rack frame for shipment.

(2) Pull center section of each cabinet mounted track out until it locks in the extended position.

(3) Position slide mechanisms of modular unit in tracks, and ease modular unit forward into rack until rearward release fin-

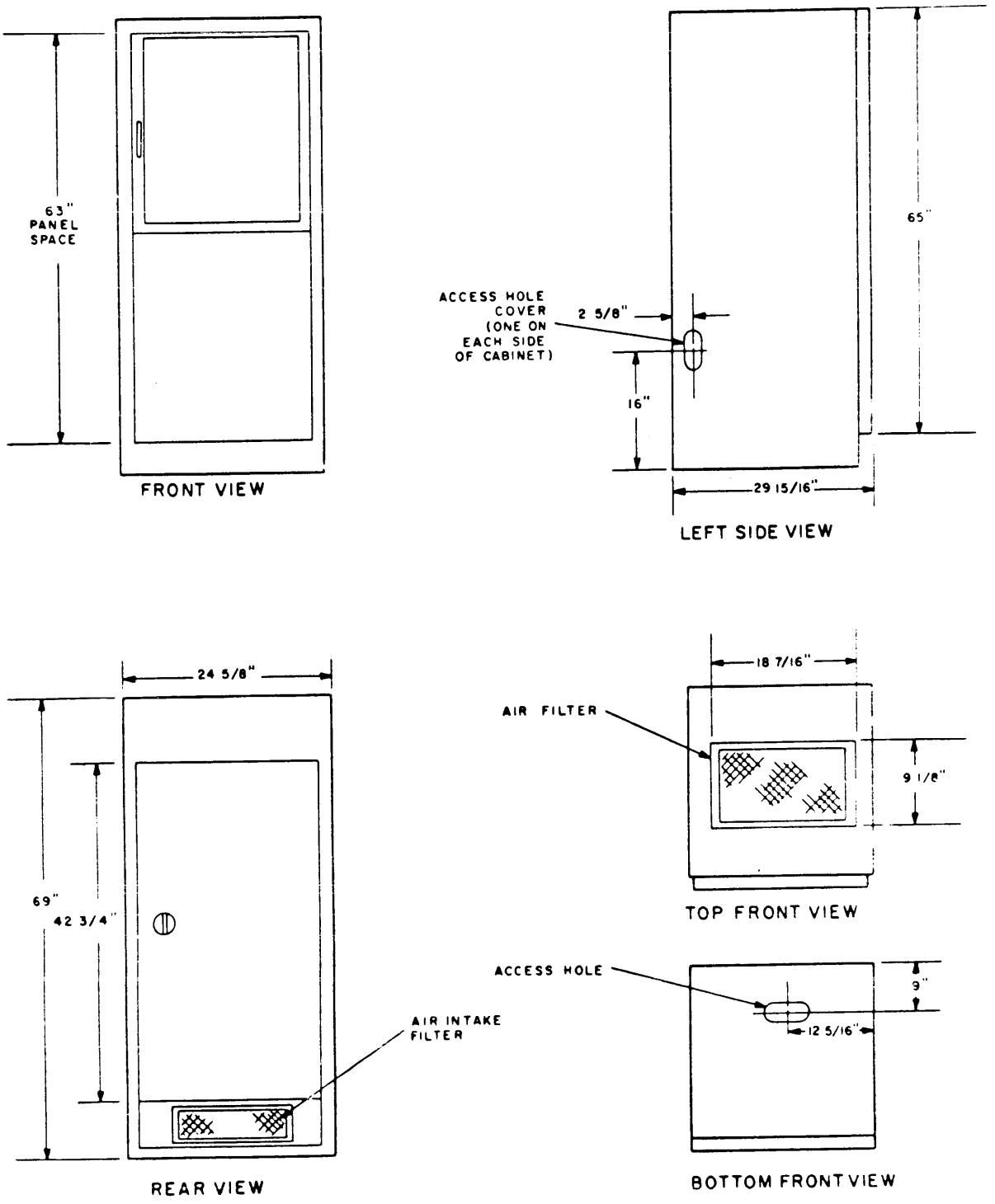


Figure 2-1. Dimensional Outline Drawing

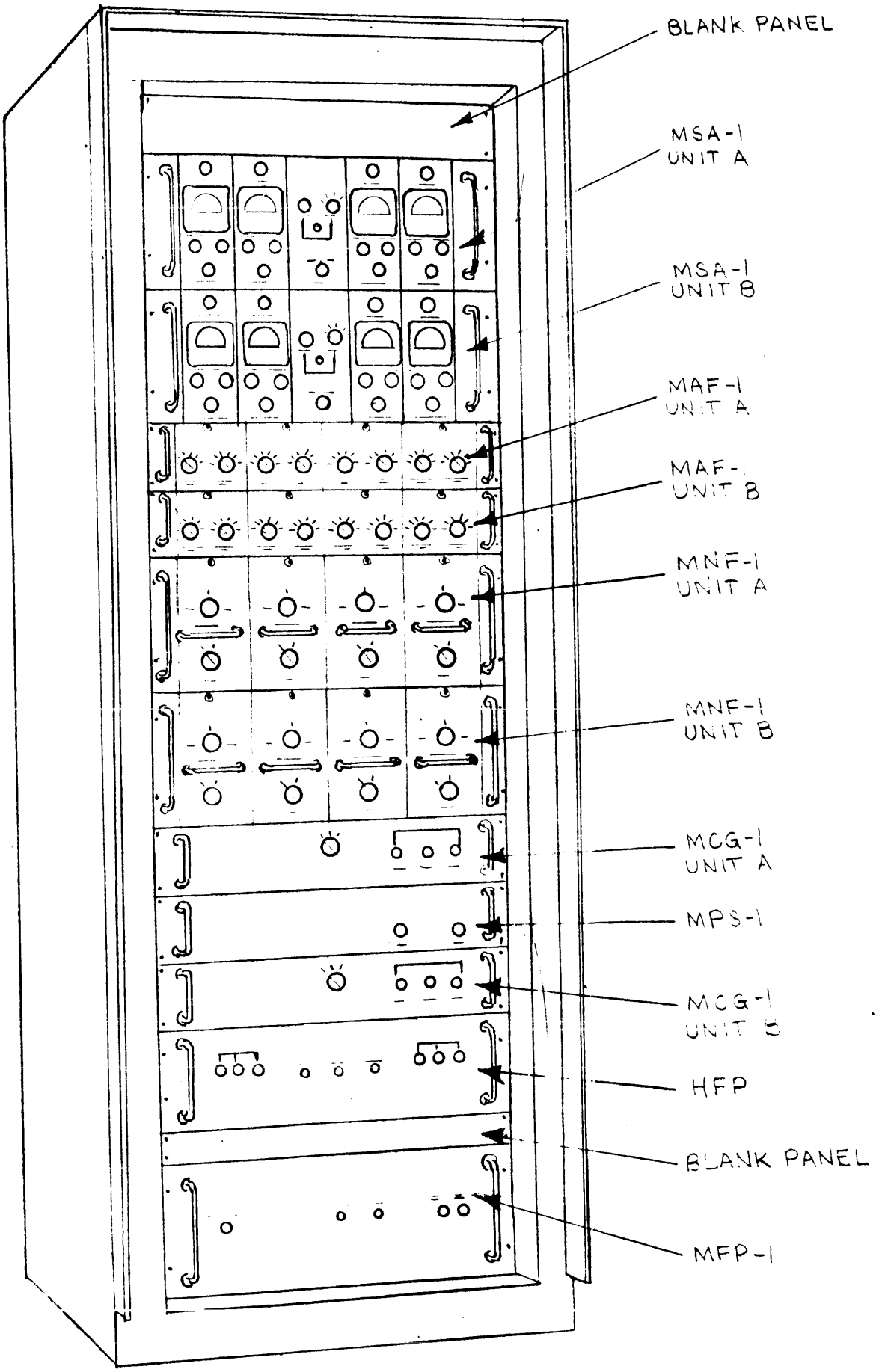


Figure 2-2. Unit Location.

gers or lock buttons engage hole in track.

(4) Depress forward release fingers or lock buttons, and slide modular unit completely into compartment.

(5) Connect all cables by refering to the interconnecting cabling drawing figure 2-3.

NOTE

Remove all tape and protective covers from blowers mounted on modular units.

(6) Secure all front panels to the rack using rack screws supplied.

c. POWER CABLE ENTRY. The power cable is connected to the MSG (A)-1 through cable access openings located on each side of the rack as well as in the center on the bottom. The main power should be fed to the unit through a three wire armored cable. The power cable is connected to the line filter located at the left rear of the rack. Remove two screws securing the line filter cover in place. Remove cover and connect the green lead to the ground terminal and the black and white leads to line terminals.

d. MSG(A) to DDR-5 RECEIVER INTERCONNECTION. Signal connections to and from the MSG(A)-1 are made to terminal board A3557 located approximately 20 inches above the floor at the right rear of the cabinet. The interconnecting cabling is not supplied and must be fabricated at the receiver site. Sixteen UG-88/U connectors are supplied for fabrication of the cables. Two fanning strips TM105-16AR are supplied for making connections to terminal strips TB8501 and TB8502. Also supplied are ten coax adapters CA-864. Eight of these adapters are used for making the interconnection between the HFR-1, AFC-3, and HFS-1 units in the DDR-5 and the MSG(A)-1. Two coax adapters are used for making connections to the MCG-1 unit B. Table 2-1 lists the interconnection between

REVISIONS								
ZONE	SYM	DESCRIPTION	DATE	E.M.N. NO.	DRAFT	CHKD	APPD
	1	EXPERIMENTAL RELEASE	5/11/67		N.T.		

THE TECHNICAL MATERIEL CORP.
MAMARONECK, NEW YORK
MODEL MSGA-I
CK-722

CA-870, CA-871, CA-872

MSA-I UNIT A

MSA-I UNIT B

MAF-I UNIT A

MAF-I UNIT B

MNF-I UNIT A

MNF-I UNIT B

MCG-I UNIT A

MCG-I UNIT B

MPS-1

MFP-1

BLOWER AX-390

FI-102

VOLT ADJ

A-3469

138 5/8

138 1/8

1/4

1/4

23 1/2

24

~UNLESS OTHERWISE SPECIFIED~
1-LAMINATE BETWEEN 2 PIECES OF VINYL PLASTIC .015 THK. TO DIMENSIONS SHOWN

NOTES

QTY/UNIT	MODEL USED ON	ASSY. NO.
1	MSGA-I	
SCALE 1:1	CODE A	

Figure 2-3. Interconnection Diagram

the MSG(A)-1 and DDR-5. When making the connections to the DDR-5 units, remove the plug from the jack indicated in table 2-1 and connect a coax adapter to the jack. Then, connect the removed plug to terminal A of the coax adapter. Terminal B of the coax adapter receives the interconnect cable to the MSG(A)-1. The number one DDR-5 components are located in the right side of cabinet and the number 2 components are located in the left side of the cabinet as viewed from the rear.

TABLE 2-1. SIGNAL INTERCONNECTION

FROM DDR-5	TO MSG(A)-1
HFR-1 No. 1 RF out J1312	J8501
HFR-1 No. 2 RF out J1312	J8502
AFC-3 No. 1 J5002	J8503
AFC-3 No. 1 J5003	J8504
AFC-3 No. 2 J5002	J8505
HFS-1 ANY JACK J3015 THROUGH J3018	J8506
HFS-1 ANY JACK J3010 THROUGH J3013	J8507
AFC-3 NO. 2 J5003	J8508
HSP-2 REC NO. 1 TERMINAL 13 (AGC)	TB8501 TERMINAL NO. 1
HSP-2 REC NO. 2 TERMINAL 13 (AGC)	TB8501 TERMINAL NO. 3
SHIELD TO NEAREST GROUND TERMINAL	SHIELDS TO TERMINAL 2
Connect coax adapter to J6002 on MCG-1 unit B. Connect two plugs marked P6002 to coax adapter.	
Connect coax adapter to J6013 on MCG-1 unit B. Connect two plugs marked P6013 to coax adapter.	

e. AUDIO OUTPUTS. Refer to figure 2-3. Terminal board TB8501 and 8502, associated with MSA-1 No. 1 and MSA-1 No. 2 respectively, are provided for the purpose of connecting terminal equipment, speakers, etc., that require an audio signal. Terminals associated with each channel (A_1, A_2, B_1, or B_2) are clearly labeled; equipment connected to these terminals must have a 600-ohm input impedance.

SECTION 3

OPERATOR'S SECTION

3-1 GENERAL

Paragraph 3-3b and 3-3c provide operating instructions for the MSG(A)-1.

It should be noted that the MSG(A)-1 comprises two MSG systems for the purpose of diversity operation. The upper of two identical modular units is associated with receiver 1 (HFR-1 No. 1, AFC-3 No. 1, etc.) of the DDR-5. The lower of two identical modular units is associated with receiver 2 of the DDR-5. Further, the serial numbers for all units associated with receiver 1 will contain the letter "A" whereas the serial number for all units associated with receiver 2 will contain the letter "B". For brevity and clarity, only those units associated with receiver 1 will be discussed in the following procedures.

Before proceeding with any of the operating procedures given in this section, the operator should familiarize himself with all controls and indicators (paragraph 3-2).

3-2. CONTROLS and INDICATORS

a. FRONT PANEL. - Figure 3-1 illustrates the location of all MSG(A)-1 front-panel controls and indicators used during normal operation with the exception of the MAIN POWER switch (refer to paragraph 3-2 b). Table 3-1 lists the controls and indicators and the function of each.

b. MAIN POWER SWITCH. - One MAIN POWER switch is located on the rear apron of Power Supply HFP-1. This switch must be set at STANDBY during MSG(A)-1 operation.

MODULAR UNIT	SERIAL DESIGNATION (FIGURE 3-1)	PANEL DESIGNATION	FUNCTION
Multiple Sideband Adapter MSA-1	1, 2, 3, 4	CHANNEL B2 CHANNEL B1 CHANNEL A1 CHANNEL A2 (lamps)	Lamp lights to indicate that associated channel is being used.
	5	MONITOR LEVEL (potentiometer)	Controls amplitude of monitered signals.
	6	MONITOR SELECT (selector switch)	Selects desired channel for monitoring.
	7, 8, 9, 10	Meters (no front-panel designation)	Indicate audio output of associated channels.
	11, 12, 13, 14	AGC DECAY	Adjusts decay time on AGC bus.
	15, 16, 17, 18	LINE LEVEL (potentiometer)	Adjusts output of audio level
	19, 20, 21, 22	SQUELCH ADJUST (potentiometer)	Adjusts the squelch level of the unit.
	23	POWER (switch)	In STDBY position, B+ is removed from unit. In ON position, power is applied to unit.
Filter MNF-1	24 25, 28, 29	NOTCH ADJUST	Tunes unwanted signal into the notch thus allowing it to be eliminated.
	26, 27, 30, 31	NOTCH (switch)	Turns off filter in OUT position

MODULAR UNIT	SERIAL DESIGNATION (FIGURE 3-1)	PANEL DESIGNATION	FUNCTION
Audio Filter MAF-1	32, 33, 36, 37	HIGH CUTOFF KC (selector switch)	Fixes the upper limit of the audio passband.
	34, 35, 38, 39	LOW CUTOFF KC (selector switch)	Fixes the lower limit of the audio passband.
Mux Carrier Generator MCG-1	40	INT/AFC/SYN (selector switch)	INT position - internal 2-mc and 250-kc oscillators of MCG-1 are used. AFC position - 2-mc and 250 kc AFC-1 outputs used in lieu of internal MCG-1 oscillators. SYN position - 2-mc and 250-kc HFS-1 outputs used in lieu of internal oscillators.
	41	OVENS HR6001 (lamp)	Lights when the 100.64-kc oven is being heated. Normally cycles on and off.
	42	OVENS HR6002 (lamp)	Lights when the 2-mc oven is being heated. Normally cycles on and off.
	43	OVENS HR6003 (lamp)	Lights when the 250-kc oven is being heated. Normally cycles on and off.

MODULAR UNIT	SERIAL DESIGNATION (FIGURE 3-1)	PANEL DESIGNATION	FUNCTION
Power Supply MPS-1	44	POWER (lamp)	Lights to indicate that MPS-1 is energized.
Power Supply HFP-1	45	STANDBY (lamp)	Lamp lights to indicate that HFP-1 is in standby condition and is sending power to Multiple Sideband Adapter MCG-1 oscillator ovens
	46	TIME DELAY (lamp)	Lamp lights to indicate that HFP-1 is going through time delay stage (approximately 60 seconds) between standby and operate condition.
	47	OPERATE (lamp)	Lamp lights to indicate that HFP-1 is in operate condition and sending power to units of MSG(A)-1
		MAIN POWER (located at rear of HFP-1 chassis)	STANDBY position energizes HFP-1.
Power Supply MFP-1	48	TIME DELAY (lamp)	Lights during periods of time delay.
	49	OPERATE (lamp)	Lights when B+ is applied to both Filter MNF-1 units.

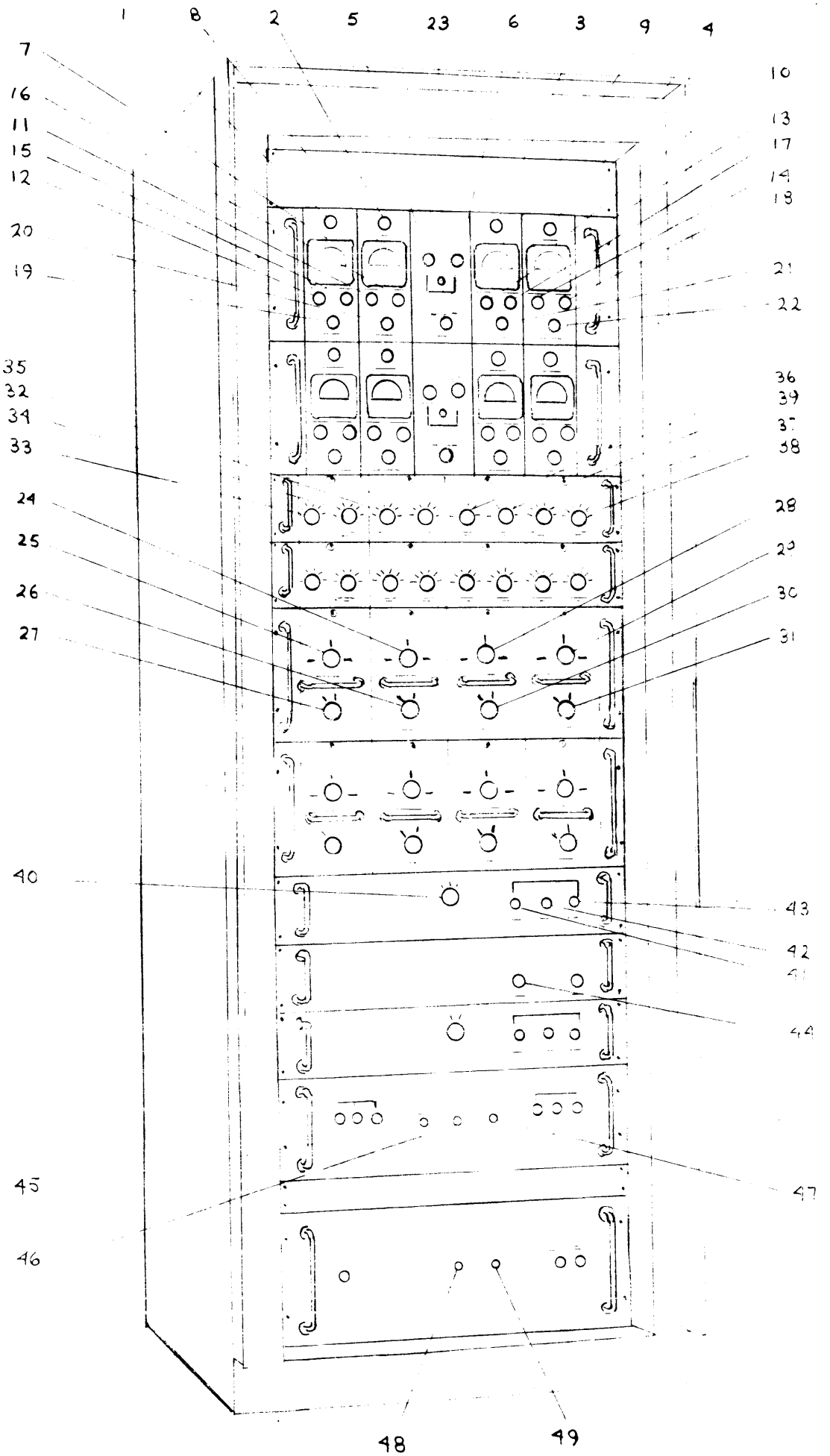


FIGURE 3-1 CONTTOLS AND INDICATORS, MSG(A)-1

3-3. OPERATING PROCEDURES

WARNING

Voltages employed in the MSG(A)-1 are high enough to be fatal. Every precaution should be taken by operating personnel to minimize the danger of shock.

a. GENERAL. - As mentioned in Section 1, the MSG(A)-1 is an accessory unit to TMC's DDR-5A receiver and is used to provide as many as four discrete 3.5 kc channels of intelligence in sideband reception. Therefore, before operating the MSG(A)-1, it is necessary to first start, tune, and operate the DDR-5A in accordance with instructions provided in the DDR-5A manual. To receive upper and/or lower sideband signals by means of the MSG(A)-1, proceed as described in paragraphs 3-3 b and 3-3 c.

Haphazard operation or improper setting of MSG(A)-1 controls will result in poor reception. For this reason, the operator should first familiarize himself with all controls and indicators on the MSG(A)-1 (refer to figure 3-1 and table 3-1).

b. STARTING PROCEDURE. - Proceed as follows:

NOTE

Numbers enclosed in parenthesis are call-outs referenced to figure 301.

(1). Ensure that INT terminals of TB8502 are connected together.

(2). Set MAIN POWER switch located on back of HFP-1 at STANDBY: green STANDBY lamp (45) on HFP-1 should light OVENS indicator lamps (41, 42, and 43) on both MCG-1 units should cycle; POWER lamp (44) on MPS-1 should light.

(3). Ensure that controls are set at positions listed below:

MODULAR UNIT	CONTROL	POSITION
Audio Filter MAF-1	Low Cutoff KC (34, 35, 38, 39)	OUT
Audio Filter MAF-1 (cont)	High Cutoff KC (32, 33, 36, 37)	OUT
Filter MNF-1	NOTCH (26, 27, 30, 31)	OUT
Mux Carrier Generator MCG-1	INT/AFC/SYN (40)	INT.
Multiple Sideband Adapter MSA-1	SQUELCH ADJUST (19, 20, 21, 22)	Fully CCW
	LINE LEVEL (15, 16, 17, 18)	1/3 CW
	AGC DECAY (11, 12, 13, 14)	Fully CCW

(4). Set POWER switch (23) of both MSA-1 units at ON; blower assembly AX-390 should operate. CHANNEL B_2, CHANNEL B_1, CHANNEL A_1, and CHANNEL A_2 indicator lamps (1, 2, 3, 4) should light; TIME DELAY indicator lamps (46 and 48) of Power Supplies HFP-1 and MFP-1 should light; OPERATE lamps (47 and 49) of HFP-1 and MFP-1 should light in approximately 60 to 90 seconds.

(5). With no signal input to MSG(A)-1, adjust SQUELCH ADJUST controls (19, 20, 21, and 22) of Multiple Sideband Adapter MSA-1 to point where CHANNEL B_2, CHANNEL B_1, CHANNEL A_1, and CHANNEL A_2 just go off. MSG(A)-1 is now ready to receive signals.

c. TUNING MSG(A)-1 FOR INBOARD AND OUTBOARD CHANNELS. - Refer to figure 3-2. Modular units located on the right side of the MSG(A)-1 are used for reception of upper sideband signals, whereas the modular units on the left side are used for lower sideband signals. Reception of upper and lower sideband is

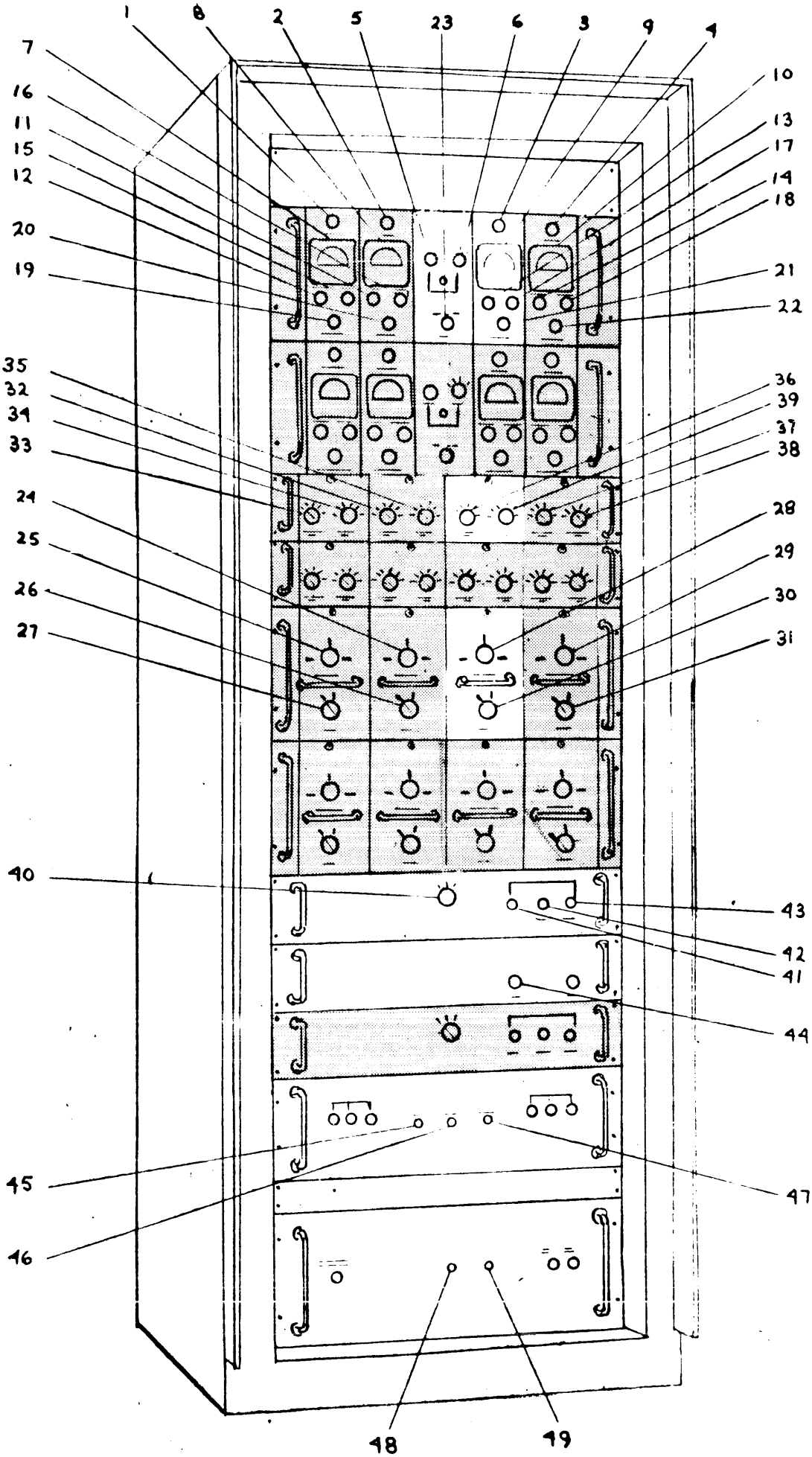


FIGURE 3-2. MODULAR UNITS ASSOCIATED WITH CHANNEL A OF RECEIVER 1

similar; therefore, only upper sideband reception is considered in this procedure. Further, operating procedures for the inboard channel (Channel A_1) and outboard (Channel A_2) are identical; therefore only channel A_1 is discussed. Figure 3-2 highlights the modular units for channel A_1 of receiver 1. Refer to figure 3-2, and proceed as follows:

NOTE

Numbers enclosed in parenthesis are callouts referenced to figure 3-2.

(1). Start the MSG(A)-1 as outlined in paragraph 3-3a.

(2). Ensure that associated DDR-5A receiver is tuned to incoming signal (refer to Section 3 of DDR-5A manual).

NOTE

With the exception of controls listed below, all controls on IF Amplifier HFI-1, Notch Filter HNF-1, AF Amplifier HFA-1, and Audio Filter HAF-1 of the DDR-5A are of no significance when using the MSG(A)-1.

(3). Set DDR-5A receiver controls as listed below:

MODULAR UNIT	CONTROL	POSITION
Audio Switch Panel HSP-2	Receiver 1 Speaker Volume	Fully CCW
	Receiver 2 Speaker Volume	Fully CCW
IF Amplifier HFI-1(both units)	AFC *	OFF

*AFC switch is set at OFF when INT/AFC/SYN switch (40) of Mux Carrier Generator MCG-1 units is set at INT or SYN. AFC switch is set at ON when INT/AFC/SYN switch of MCG-1 is set at AFC. Normal setting of AFC and INT/AFC/SYN switch is at OFF and SYN respectively.

(4) In order to monitor the MSG(A)-1, plug headphones into MONITOR JACK of Multiple Sideband Adapter MSA-1. Set MONITOR SELECT switch (6) at A_1 and adjust MONITOR LEVEL control

(5) as required to vary volume of audio output signal.

(5) During period of no incoming signal, readjust SQUELCH ADJUST control (21) of MSA-1 for point where CHANNEL A_1 lamp just goes off.

(6) Adjust LINE LEVEL control (17) of MSA-1 for 0 VU indication on CHANNEL A_1 LINE LEVEL meter (9).

(7) Adjust AGC DECAY control (13) of MSA -1 for time constant best suited for incoming signal.

(8) If interfering signals are present, set NOTCH switch (30) of Filter MNF-1 at IN and adjust NOTCH ADJUST control (28) as required to eliminate interfering signal.

(9) If interference due to local environment, transmitters, etc., is present in received signal, adjust LOW CUTOFF KC and HIGH CUTOFF KC controls (36 and 39) of Audio Filter MAF-1 for minimum interference.

d. STOPPING PROCEDURE

(1). NORMAL STOPPING. - To turn off the MSG(A)-1 under normal conditions, set POWER switch (23) of Multiple Sideband Adapter MSA-1 at STDBY; OVENS HR6001, OVENS HR6002, and OVENS HR6003 lamps (41, 42, and 43) should continue to cycle.

(2). EMERGENCY STOPPING PROCEDURE. - To turn off the MSG(A)-1 under emergency conditions, set MAIN POWER switch located on rear of Power Supply HFP-1 chassis at OFF. In this condition, a-c power is completely removed from the MSG(A)-1, and all indicator lamps will go off.

3-4. OPERATOR's MAINTENANCE

a. GENERAL. - The operator should observe that modular-unit controls, indicator lamps, and meters are in good condition and functioning properly (see figure 3-1 and table 3-1). Daily during operation, all electrical quantities measurable with built-in meters should be observed and compared with established standards for irregularity. Any noticeable irregularity is an indication of trouble.

b. REPLACEMENT OF FUSES. - All fuses for the MSG(A)-1 are located on Power Supply HFP-1, Power Supply MPS-1, and Power Supply MFP-1. The operator should replace fuses as required.

CAUTION

Do not replace a fuse with one of higher rating. If a fuse burns out immediately after replacement, do not replace it a second time until the trouble has been located and corrected.

SECTION 4

MATERIAL LISTS

MATERIAL LIST / NUMERICAL PARTS LIST

REV.

USED ON MODEL: MSGA-1

SHEET OF

ASSY PART NO.: MSGA-1

ASSY TITLE: Independent AGC Receiver Sys.

NEXT ASSY:

QTY PER NEXT ASSY: 1

ASSY LEVEL: 0

LIST SECTION	PART NO.	DESCRIPTION	ITEM LOCATION: USED ON ASSEMBLY	ITEM LOCATION: USED TO MOUNT	ITEM LOCATION: QTY PER USED TO MOUNT	QTY PER ASSY	REFERENCE SYMBOLS	REMARKS
2	MSA-1	Multiple Sideband Adapter	MSGA-1			2		ML
2	MCG-1	Multiplex Carrier Generator				2		ML
2	MNF-1	Multiple Notch Filter				2		ML
2	MAF-1	Multiple Audio Filter				2		ML
2	MFP-1	POWER SUPPLY				1		ML
2	MPS-1	Power Supply				1		ML
2	HFP-1	Power Supply				1		ML
2	RAK35A	CABINET ASSEMBLY				1		ML
6	IN4004	MANUAL, INSTRUCTION				2		
6	UG88*/U	CONN, PLUG, BNC				20		
6	TP116-1	SCREW DRIVER				1		
6	TP117-1	WRENCH, SOCKET				1		
6	WR100-2	WRENCH, HEX				1		
6	WR100-18	WRENCH, HEX				1		
6	WR100-19	WRENCH, HEX				1		
6	TM105-16AR	STRIP, FANNING				2		
6	CA864	CABLE ASSEMBLY				10		

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TMC FORM PML-3

MATE[illegible]IAL LIST / NUMERICAL PARTS LIST | REV. | USED ON MODEL: M5GA-1 | SHEET 1 OF 1

ASSY PART NO.: RAK35A | ASSY TITLE: | NEXT ASSY: M5GA-1 | QTY PER NEXT ASSY: 1 | ASSY LEVEL: 1

LIST SECTION	PART NO.	DESCRIPTION	ITEM LOCATION: USED ON ASSEMBLY	ITEM LOCATION: USED TO MOUNT	ITEM LOCATION: QTY PER USED TO MOUNT	QTY PER ASSY	REFERENCE SYMBOLS	REMARKS
4	A3527	CABINET ASSEMBLY	RAK35A			1		
						1		
4	A3469	CABLE ASSEMBLY	[illegible]			1		
						1		
3	FI102	FILTER, POWER LINE	RAK35A			1		
5	CK722	DIAGRAM, INTERCONN	RAK35A			1		
4	A-3557-2	AUDIO FILTER ASSY	RAK35A			1		
5	CH-330	CHART, UNIT BREAKDOWN	RAK35A			1		

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TMC FORM PML-3

LIST SECTION

MATERIAL LIST / NUMERICAL PARTS LIST

REV.

USED ON MODEL: MSSA-1

SHEET 1 OF 1

ASSY PART NO.: A3469 | ASSY TITLE: CABLE ASSEMBLY | NEXT ASSY: RAK-5A | QTY PER NEXT ASSY: 1 | ASSY LEVEL: 2

PART NO.	DESCRIPTION	ITEM LOCATION			QTY PER ASSY	REFERENCE SYMBOLS	REMARKS
		USED ON ASSEMBLY	USED TO MOUNT	QTY PER USED TO MOUNT			
4 CA870	CABLE HARNESS	A3469			1		
4 CA871	CABLE HARNESS	A3469			1		
4 CA872	CABLE HARNESS	A3469			1		

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TMC FORM PML-3

MATERIAL LIST / NUMERICAL PARTS LIST | REV. | USED ON MODEL: [illegible] MS-1 | SHEET 1 OF 1

ASSY PART NO.: A3527 | ASSY TITLE: CHASSIS ASSY | NEXT ASSY: RMK35A | QTY PER NEXT ASSY: 1 | ASSY LEVEL: 2

LIST SECTION	PART NO.	DESCRIPTION	ITEM LOCATION: USED ON ASSEMBLY	ITEM LOCATION: USED TO MOUNT	ITEM LOCATION: QTY PER USED TO MOUNT	QTY PER ASSY	REFERENCE SYMBOLS	REMARKS
3	TK114-18	TRACK + SLIDE SET	A3527			6		
3	TK113-18	TRACK + SLIDE SET				8		
3	TK115-18	TRACK + SLIDE SET				4		
4	A3517	SPRING, RETAINING, ASSY				8		
3	CU 131-8	CLAMP, CABLE				3		
3	CU 131-6	CLAMP, CABLE				2		
3	CU 131-5	CLAMP, CABLE				3		
3	TE 104-2	TERM., LUG				8		
3	SCBP0632BN4	SCR. MACH				8		
3	SCBP1032BN8	SCR. MACH				24		
3	LWE06MRN	WASH., LK, EXT				8		
3	LWE10MRN	WASH., LK, EXT				24		
3	NTH0632CN12	NUT, HEX				8		
3	CU131-4	CLAMP, CB;				4		
3	SCFP0832BN6	SCR, MACH.				4		
3	NTH0832BN10	NUT, HEX				4		
3	LWE08MRN	WASH LK, EXT				4		
4	AX 390	FAN ASSY				1		
3	CU151-1-0	RETAINER, CABLE STRAP				4		
3	CU 142-1-0	STRAP CABLE				4		
3	MS 3720	FRAME, CABINET	A3527			1		
5	S220	ENAM. [illegible]	MS3720			X		
5	S114	PRM, ZN, CHROMATE	MS3720			X		
3	MS 3088	FRAME, CABINET	MS3720			1		

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TMC FORM PML-3

MSSA-1 A3527

MATERIAL LIST / NUMERICAL PARTS LIST

REV.: | USED ON MODEL: | SHEET 1 OF 2

ASSY PART NO.: AX390 | ASSY TITLE: ASSY, FAN | NEXT ASSY: | QTY PER NEXT ASSY: 1 | ASSY LEVEL: 3

LIST SECTION	PART NO.	DESCRIPTION	USED ON ASSEMBLY	USED TO MOUNT	QTY PER USED TO MOUNT	QTY PER ASSY	REFERENCE SYMBOLS	REMARKS
3	LD1341/MS3351	CHASSIS, FAN	AX390			1		
3	MS3351	CHASSIS, FAN	LD1341			1		
3	MS3352	COVER, FAN CHASSIS	AX390			1		
3	BL112	FAN, CENTRIFUGAL, DUAL	AX390			1	B9001	
3	CP113-1	CAPACITOR, FXD	AX390			1	C9001	
3	CU143-1	RETAINER, CAPACITOR	AX390	CP113	1	1		
3	TM102-5	BOARD, TERMINAL	AX390			1	TB9002	
3	PX336-5	STRIP, INSULATOR	AX390	TM102	1	1		
3	MS154-1	MTG PL, TERM. BD	AX390	TM102	1	2		
3	TA111-4-8-6.25A	TAPE, URETHANE	AX390			4		
3	TA111-4-84.25A	" "	AX390			4		
3	EY102-26	GROMMET, ELASTIC	AX390			4		
4	CA706-1	ASSY, CBL	AX390			1		
3	CU107-2	BUSHING, STRAIN RELIEF	AX390			1		
3	SCBP0440BN10	SCREW, MACHINE	AX390	TM102	4	4		
3	LWE04MRN	WASHER, LK, EXT	AX390	TM102	4	4		
3	NTH0440BN3	NUT, HEX	AX390	TM102	4	4		
3	SCBP0632BN6	SCREW, MACHINE	AX390			21		
3	LWS06MRN	WASHER, LK, SPLIT	AX390			2		
3	NTH0632BN8	NUT, HEX	AX390			2		
3	SMIRTD1032	NUT, HEX, SELF LK	AX390			4		
3	PX[illegible]-1-330	SLVG, INS	AX390			5"		
3	PX[illegible]-186	SLVG, INS	AX390			12"		
4	[illegible]-32-2.25	LEAD, ELECT	AX390			3		115V OP
4	[illegible]-2.25	LEAD, ELECT	AX390			2		230V OP
3	TE103-2	TERM. LUG	AX390			5		

MATERIAL LIST / NUMERICAL PARTS LIST | REV. | USED ON MODEL: MS6A-1 | SHEET 2 OF 2

ASSY PART NO.: AX390 | ASSY TITLE: FAN ASSY | NEXT ASSY: A3527 | QTY PER NEXT ASSY: 1 | ASSY LEVEL: 3

LIST SECTION

PART NO.	DESCRIPTION	ITEM LOCATION: USED ON ASSEMBLY	ITEM LOCATION: USED TO MOUNT	ITEM LOCATION: QTY PER USED TO MOUNT	QTY PER ASSY	REFERENCE SYMBOLS	REMARKS
3 GS100	SOLDER, TIN ALLY	AX390			X		
3 WA139-1	WASHER, RECESSED	AX390			8		

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TMC FORM PML-3

LIST SECTION

MATERIAL LIST / NUMERICAL PARTS LIST | REV. | USED ON MODEL: MS6A-1 | SHEET 1 OF 1

ASSY PART NO.: CA706-1 | ASSY TITLE: CABLE, AC PWR | NEXT ASSY: AX370 | QTY PER NEXT ASSY: 1 | ASSY LEVEL: 4

PART NO.	DESCRIPTION	ITEM LOCATION: USED ON ASSEMBLY	ITEM LOCATION: USED TO MOUNT	ITEM LOCATION: QTY PER USED TO MOUNT	QTY PER ASSY	REFERENCE SYMBOLS	REMARKS
3 PL177	CONN, PL	CA706-1			1		
3 TE120-2	TERM, SOLDERLESS	↓			2		
3 WI112-1	CBL, AC, SHIELDED	↓			54		BLK

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TMC FORM PML-3

MATERIAL LIST / NUMERICAL PARTS LIST | REV. | USED ON MODEL: MS6A-1 | SHEET 1 OF 3

ASSY PART NO: CA870 | ASSY TITLE: CABLE HARNESS | NEXT ASSY: A3469 | QTY PER NEXT ASSY: 1 | ASSY LEVEL: 3

LIST SECTION	PART NO.	DESCRIPTION	ITEM LOCATION: USED ON ASSEMBLY	ITEM LOCATION: USED TO MOUNT	ITEM LOCATION: QTY PER USED TO MOUNT	QTY PER ASSY	REFERENCE SYMBOLS	REMARKS
3	RG174/U	CABLE, COAX	CA870					
3	WL103-5	BRAID, WIRE, FLAT						
3	PL240	CONN, PLUG, BNC				96		
3	TE155-34853	TERM. LUG				7		
3	TE1046	LUG, SOLDERLESS				1		
3	PX100-1-625	SLVG, INS						
3	PX100-1-375	SLVG, INS						
3	CD101-1MW	CORD, LACING						
3	LA107-8-1	MARKER, SLEEVE				2		
4	LA107-8-2					3		
	3					2		
	4					2		
	5					2		
	6					2		
	8					3		
	9					2		
	13					8		
	14					8		
	15					2		
	16					2		
	17					2		
	26					2		
	54					3		
3	LA107-[illegible]					3		
3	CL113	PLASTIC, LIQUID				X		
3	LA107-8-51	MARKER				1		

THE TECHNICAL MATERIEL CORPORATION — MAMARONECK, NEW YORK

TMC FORM PML-3

MATERIAL LIST / NUMERICAL PARTS LIST | REV. | USED ON MODEL: MSGA-1 | SHEET 2 OF 3

ASSY PART NO.: CA870 | ASSY TITLE: CABLE HARNESS | NEXT ASSY: A3469 | QTY PER NEXT ASSY: 1 | ASSY LEVEL: 3

LIST SECTION	PART NO.	DESCRIPTION	ITEM LOCATION: USED ON ASSEMBLY	ITEM LOCATION: USED TO MOUNT	ITEM LOCATION: QTY PER USED TO MOUNT	QTY PER ASSY	REFERENCE SYMBOLS	REMARKS
3	LA107-8-18	MARKER, SLEEVE	CA870			2		
	-19					2		
	-20					2		
	-21					2		
	-22					2		
	-23					2		
	-24					2		
	-27					2		
	-28					2		
	-29					2		
	-30					2		
	-31					2		
	-32					2		
	-33					2		
	-34					2		
	-35					2		
	-36					2		
	-37					2		
	-38					2		
	-39					2		
	-40					2		
	-41					2		
	-42					2		
	-43					2		
	-44					2		
3	LA107-8-45					2		

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TMC FORM PML-3

LIST SECTION

MATERIAL LIST / NUMERICAL PARTS LIST

REV.

USED ON MODEL: MSA-1

SHEET 3 OF 3

ASSY PART NO.: CA870 | ASSY TITLE: CAL | NEXT ASSY: A3468 | QTY PER NEXT ASSY: | ASSY LEVEL:

	PART NO.	DESCRIPTION	ITEM LOCATION: USED ON ASSEMBLY	ITEM LOCATION: USED TO MOUNT	ITEM LOCATION: QTY PER USED TO MOUNT	QTY PER ASSY	REFERENCE SYMBOLS	REMARKS
3	LA187-8-52	MARKER	CA870			1		
	53	↓	↓			1		
	54					1		
	55					1		
	56					1		
	57					1		
	58					1		

THE TECHNICAL MATERIEL CORPORATION — MAMARONECK, NEW YORK

TMC FORM PML-3

MATERIAL LIST / NUMERICAL PARTS LIST | REV. | USED ON MODEL: MSQA-1 | SHEET 1 OF 3

ASSY PART NO.: CA871 | ASSY TITLE: CABLE HARNESS | NEXT ASSY: [illegible] | QTY PER NEXT ASSY: 1 | ASSY LEVEL: 3

LIST SECTION	PART NO.	DESCRIPTION	ITEM LOCATION: USED ON ASSEMBLY	ITEM LOCATION: USED TO MOUNT	ITEM LOCATION: QTY PER USED TO MOUNT	QTY PER ASSY	REFERENCE SYMBOLS	REMARKS
3	MWC24(7) U4	WIRE, INS	CA871			X		
	U5					X		
	U2							
	MWC[illegible](7) U6							
	MWC22(7) SJ6	CABLE, SHLD, JKT						
	MWC24(7) U7	WIRE, INS						
	U8							
	U10							
	U9							
	U3							
	U1							
	U92							
	U90							
	U93							L
	U94							
	U97							
	U98							
	U91							
	U96							
	MWC24(7) U95							
	MWC16(16) U3							
	U9							
	U1							
	U95							
	U91							
3	MWC16(16) U8					X		

THE TECHNICAL MATERIEL CORPORATION — MAMARONECK, NEW YORK

TMC FORM PML-8

MATERIAL LIST / NUMERICAL PARTS LIST | REV. | USED ON MODEL: MSGA-1 | SHEET 2 OF 3

ASSY PART NO.: CA 871 | ASSY TITLE: CABLE HARNESS | NEXT ASSY: A 2467 | QTY PER NEXT ASSY: 1 | ASSY LEVEL: 3

LIST SECTION	PART NO.	DESCRIPTION	ITEM LOCATION: USED ON ASSEMBLY	ITEM LOCATION: USED TO MOUNT	ITEM LOCATION: QTY PER USED TO MOUNT	QTY PER ASSY	REFERENCE SYMBOLS	REMARKS
3	CD101-10N	CORD, LACING	CA871			X		
3	PX102-1-203	SLUG, INS				|		
↑	625					|		
|	1250					|		
|	375					|		
|	500					|		
↓	438					|		
3	PX102-1-053					X		
3	TP121-18	TOOL, APPLICATION				1		
3	GL 133	PLASTIC, LIQUID				X		
3	MS3428-16A	CONN				15		
3	MS3420-12A	CONN				8		
3	MS3420-10A	CONN				3		
3	MS3420-6A	CONN				4		
3	PL 212-3	CONN				4		
3	PL 212-1	CONN				11		
3	LA107-20-10	MARKER				2		
↑	-11					1		
|	-25					2		
|	-46					2		
|	-48					1		
|	-49					1		
|	-55					1		
|	-56					1		
↓	-57					1		
	LA107-20-58					1		

THE TECHNICAL MATERIEL CORPORATION — MAMARONECK, NEW YORK

TMC FORM PML-3

MATERIAL LIST / NUMERICAL PARTS LIST | REV. | USED ON MODEL: MSRA-1 | SHEET 3 OF 3

ASSY PART NO.: CA871 | ASSY TITLE: CHIEF MARKER | NEXT ASSY: A3467 | QTY PER NEXT ASSY: 1 | ASSY LEVEL: 3

LIST SECTION	PART NO.	DESCRIPTION	ITEM LOCATION: USED ON ASSEMBLY	ITEM LOCATION: USED TO MOUNT	ITEM LOCATION: QTY PER USED TO MOUNT	QTY PER ASSY	REFERENCE SYMBOLS	REMARKS
3	LA107-20-59	MARKER	CA871			1		
	LA107-20-68	↓	↓			1		
	LA107-20-71					3		

THE TECHNICAL MATERIEL CORPORATION — MAMARONECK, NEW YORK

TMC FORM PML-3

LIST SECTION

MATERIAL LIST / NUMERICAL PARTS LIST | REV. | USED ON MODEL: MSA-1 | SHEET 1 OF 1

ASSY PART NO.: CA 872 | ASSY TITLE: CABLE HARNESS | NEXT ASSY: A3467 | QTY PER NEXT ASSY: 1 | ASSY LEVEL: 3

PART NO.	DESCRIPTION	ITEM LOCATION: USED ON ASSEMBLY	ITEM LOCATION: USED TO MOUNT	ITEM LOCATION: QTY PER USED TO MOUNT	QTY PER ASSY	REFERENCE SYMBOLS	REMARKS
MWC22(7)SJ9	WIRE, INS	CA872			X		
SJ1	↑	↓			1		
6	↑	↓			1		
92	↑	↓			1		
96	↑	↓			1		
95	↑	↓			1		
94	↑	↓			1		
4	↑	↓			1		
1	↑	↓			1		
6	↑	↓			1		
90	↑	↓			1		
93	WIRE, INS	↓			↓		
D131-1MW	CORD, LACING	↓			X		
PXMA-1-375	SLVG, INS	↓			2		
TM105-12AL	STRIP, FANNING	↓			2		
CU167-5	CLAMP	↓			2		
SCPM632BN6	SCREW, MACHINE	↓			2		
FW06 MSN	WASHER, FLAT	↓			2		
LWI 06 MSN	WASHER, LK, INT	↓			2		
NTH 632 BN8	NUT, HEX	↓			2		
LAD7-15-72	MARKER	↓			3		
GL133	PLASTIC, LIQUID	↓			X		
TP121-15	TOOL, APPLICATOR	↓			1		

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MATERIAL LIST/NUMERICAL PARTS LIST | REV. | USED ON MODEL: MSCA-1 | SHEET 1 OF 1

ASSY PART NO.: A3517 | ASSY TITLE: ASSY, SPR RTG | NEXT ASSY: A3527 | QTY PER NEXT ASSY: 8 | ASSY LEVEL: 3

LIST SECTION	PART NO.	DESCRIPTION	ITEM LOCATION: USED ON ASSEMBLY	ITEM LOCATION: USED TO MOUNT	ITEM LOCATION: QTY PER USED TO MOUNT	QTY PER ASSY	REFERENCE SYMBOLS	REMARKS
3	SP137-2	SPRING, RETRACTING	A3517			1		
3	MS2478	BRKT, SPRING MTG	A3517			1		
3	SCBP[illegible]	SCR, MACH.	A3517			2		
3	LWE[illegible]	WASH., LK, EXT	A3517			2		

MATERIAL LIST / NUMERICAL PARTS LIST | REV. | USED ON MODEL: MS6A-1 | SHEET 1 OF 1

ASSY PART NO.: A3557-2 | ASSY TITLE: FILTER SUBASSY | NEXT ASSY: A3435A | QTY PER NEXT ASSY: 1 | ASSY LEVEL: 3

LIST SECTION	PART NO.	DESCRIPTION	ITEM LOCATION: USED ON ASSEMBLY	ITEM LOCATION: USED TO MOUNT	ITEM LOCATION: QTY PER USED TO MOUNT	QTY PER ASSY	REFERENCE SYMBOLS	REMARKS
4	A3557-1	PANEL ASSY	A3557-2			1		
4	A3417-4	BOARD, TERM. ASSY				1	TB8504	
4	A3416-4	BOARD, TERM. ASSY				1	TB8503	
3	SCEP0632BN	SCREW, MACHINE				4		
3	MS3665	BRACKET		A3417	2			
				A3416	2	4		

THE TECHNICAL MATERIEL CORPORATION — MAMARONECK, NEW YORK

TMC FORM PML-3

MATERIAL LIST / NUMERICAL PARTS LIST | REV. | USED ON MODEL: MSGA-1 | SHEET 1 OF 1

ASSY PART NO.: CA407-32-228 | ASSY TITLE: | NEXT ASSY: AX290 | QTY PER NEXT ASSY: 1 | ASSY LEVEL: 4

LIST SECTION	PART NO.	DESCRIPTION	ITEM LOCATION: USED ON ASSEMBLY	ITEM LOCATION: USED TO MOUNT	ITEM LOCATION: QTY PER USED TO MOUNT	QTY PER ASSY	REFERENCE SYMBOLS	REMARKS
3	MWC22(7)U6	WIRE INS	CA407			3	?	
3	TE120-2	TERM	CA407			2		

THE TECHNICAL MATERIEL CORPORATION — MAMARONECK, NEW YORK

TMC FORM PML-3

MATERIAL LIST / NUMERICAL PARTS LIST | REV. | USED ON MODEL: A500-1 | SHEET 2 OF 2

ASSY PART NO.: A3416-4 | ASSY TITLE: Terminal Board Assy | NEXT ASSY: A3537-2 | QTY PER NEXT ASSY: 1 | ASSY LEVEL: 4

LIST SECTION	PART NO.	DESCRIPTION	ITEM LOCATION: USED ON ASSEMBLY	ITEM LOCATION: USED TO MOUNT	ITEM LOCATION: QTY PER USED TO MOUNT	QTY PER ASSY	REFERENCE SYMBOLS	REMARKS
4	A3416-3	BOARD, TERM, SUB ASSY	A3416-1			1		
4	A3416-2	LOAD, TERM, MARKED	A3416-3			1		
4	A3416-1	BOARD, TERM, MARKED	A3416-2			1		
5	S727	SPECIFICATIONS, MARKING	A3416-2			1		
3	TE102-2	STANDOFF, RWT TYPE	A3416-3			2		
3	TE101-2	TERMINAL, SOLD LUG	A3416-3			52		
3	CL270-10	COIL, R.F	A3416-4			16	L1 - L16 INCL	
3	PX104-1-294	SLUG, INSULATION	A3416-4			X		
3	CM15B511J	CAPACITOR, FXD, MICA	A3416-4			8	C1 - C8 INCL	
3	PX104-1-294	SLUG, INSULATION	A3416-4			X		
3	PX104-3-234					X		
3	PX104-8-133					X		
3	PX104-2-263					X		
3	PX104-6-166					X		
3	PX104-4-288					X		
3	PX104-9-118					X		
3	PX104-5-186					X		
3	PX104-7-148					X		
3	WL100-7	WIRE, BUSS	A3416-4			X		
3	LS100	SOLDER, TIN ALLOY	A3416-4			X		

THE TECHNICAL MATERIEL CORPORATION — MAMARONECK, NEW YORK

TMC FORM PML-3

MATERIAL LIST / NUMERICAL PARTS LIST | REV. | USED ON MODEL: MSCH-1 | SHEET 1 OF 7

ASSY PART NO.: A3417-4 | ASSY TITLE: TERMINAL BOARD ASSY | NEXT ASSY: A3577-2 | QTY PER NEXT ASSY: 1 | ASSY LEVEL: 4

LIST SECTION	PART NO.	DESCRIPTION	ITEM LOCATION: USED ON ASSEMBLY	ITEM LOCATION: USED TO MOUNT	ITEM LOCATION: QTY PER USED TO MOUNT	QTY PER ASSY	REFERENCE SYMBOLS	REMARKS
3	TE105-2	STANDOFF, RIVET TYP	A34173			2		
3	TE107-2	TERMINAL, SPLIT LUG	A3417-3			50		
3	CL270-10	COIL, R.F.	A3417-4			16	L17 - L32 INCL	
3	CM15B511J	CAPACITOR, FXD, MICA	A3417-4			8	C9 - C16 INCL	
3	PX104-1-294	SLVG, INSULATION	A3417-4			X		
5	S727	SPECIFICATION MARKING	A3417-2			1		
3	PX104-3-294	SLVG, INSULATION	A3417-4			X		
3	PX104-8-133	SLVG, INSULATION	A3417-4			X		
3	PX104-2-263	SLVG, INSULATION	A3417-4			X		
3	PX104-6-166	SLVG, INSULATION	A3417-4			X		
3	PX104-4-288	SLVG, INSULATION	A3417-4			X		
3	PX104-9-118	SLVG, INSULATION	A3417-4			X		
3	PX104-5-186	SLVG, INSULATION	A3417-4			X		
3	PX104-7-148	SLVG, INSULATION	A3417-4			X		
3	WL100-7	WIRE, BUSS	A3417-4			X		
3	BS100	SOLDER, TIN ALLOY	A3417-4			X		
4	A3417-3	BD, TERM, SUBASSY	A3417-4			1		
4	A3417-2	BD, TERM, LETTERED	A3417-3			1		
4	A3417-1	BD, TERM, MARKED	A3417-2			1		

THE TECHNICAL MATERIEL CORPORATION — MAMARONECK, NEW YORK

TMC FORM PML-3

MATE...AL LIST/NUMERICAL PARTS LIST REV.

USED ON MODEL: MSSA-1 SHEET 1 OF 1

ASSY PART NO.: A3557-1 ASSY TITLE: ASSY, PNL NEXT ASSY: A3557-2 QTY PER NEXT ASSY: 1 ASSY LEVEL: 4

LIST SECTION	PART NO.	DESCRIPTION	ITEM LOCATION: USED ON ASSEMBLY	ITEM LOCATION: USED TO MOUNT	ITEM LOCATION: QTY PER USED TO MOUNT	QTY PER ASSY	REFERENCE SYMBOLS	REMARKS
3	LD1446/PX837	PANEL, PATCH	A3557-1			1		
3	PX837	PANEL, PATCH	LD1446			1		MACH
3	UG625*/U	CONN, RECEPT, R.F.	A3557-1			8	J8501-J8508 INCL	
3	TM100-16	BOARD, TERM				2	TB8501, TB8502	
3	TE111-2	TERM, LUG		UG625	1	8		
3	SCBP0440BN	SCREW, MACHINE		TM100	4	8		
3	NTH0440BN	NUT, HEX		TM100	4	8		
3	LWS0440MPN	WASHER, LK, SPLIT		TM100	4	8		

THE TECHNICAL MATERIEL CORPORATION MAMARONECK, NEW YORK

TMC FORM PML-3