INSTRUCTION BOOK

MODEL ET-8023-DI

HIGH FREQUENCY RADIOTELEGRAPH TRANSMITTER

Power Output - 200 Watts

Frequency Range - 2,000 to 24,000 K. C.

ENGINEERING DEPARTMENT

RADIOMARINE CORPORATION OF AMERICA

75 VARICK STREET, NEW YORK, N. Y.

May, 1944

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MODEL ET-8023-D1
HIGH FREQUENCY TRANSMITTER

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INSTRUCTION BOOK

MODEL ET-8023-D1
HIGH FREQUENCY
RADIOTELEGRAPH TRANSMITTER

INTRODUCTION

The model ET-8023-D1 high frequency radiotelegraph transmitter is designed primarily for shipboard applications as listed below:

1 - For use in conjunction with a Radiomarine model 3U (intermediate frequency) radio unit. In such installations, the model ET-8023-D1 uses the main motor generator and automatic starter of the model 3U radio unit. For example, on EC2-S-C1 Liberty vessels the addition of the ET-8023-D1 provides high frequency facilities.

2 - For use as an independent high frequency transmitter, in which case the model ET-8023-D1 must be furnished with its own motor generator and automatic starter, these two units being mounted inside the high frequency frame.

For application 1 (ET-8023-D1 in conjunction with model 3U), a suitable length of 28 conductor lead and armored cable and lengths of copper tubing are furnished for interconnecting the equipment. See "Installation Instructions" in this book for details.

The frame of the ET-8023-D1 is designed to mount a model AR-8506-B, or a model SLR-F, radio receiver directly beneath the high frequency transmitter. A small operating table, on which is mounted the telegraph key, is also provided with the ET-8023-D1. A motor generator transfer switch, mounted to the left of the radio receiver, is provided in the frame so that the motor generator circuits may be quickly transferred for high frequency or intermediate frequency operation.

An antenna circuit transfer switch is mounted at the top of the frame so that the high frequency transmitter may be interconnected with the main and emergency antenna circuits of the 3U equipment.

The high frequency transmitter used in this equipment is the same as the ET-8023 transmitter employed in the model 4U radio unit. In other words, the hinged section of the transmitter itself is the same in ET-8023-D1 as in model 4U. However, the ET-8023-D1 terminal blocks, external circuits, etc., in the lower section of the frame are different in ET-8023-D1 to provide interconnection with the model 3U.

The first section of this instruction book covers the operating instructions and general characteristics of the ET-8023-D1. The second section of this book covers installation instructions which should be carefully studied by installation personnel before interconnecting the ET-8023-D1 with the model 3U radio unit.

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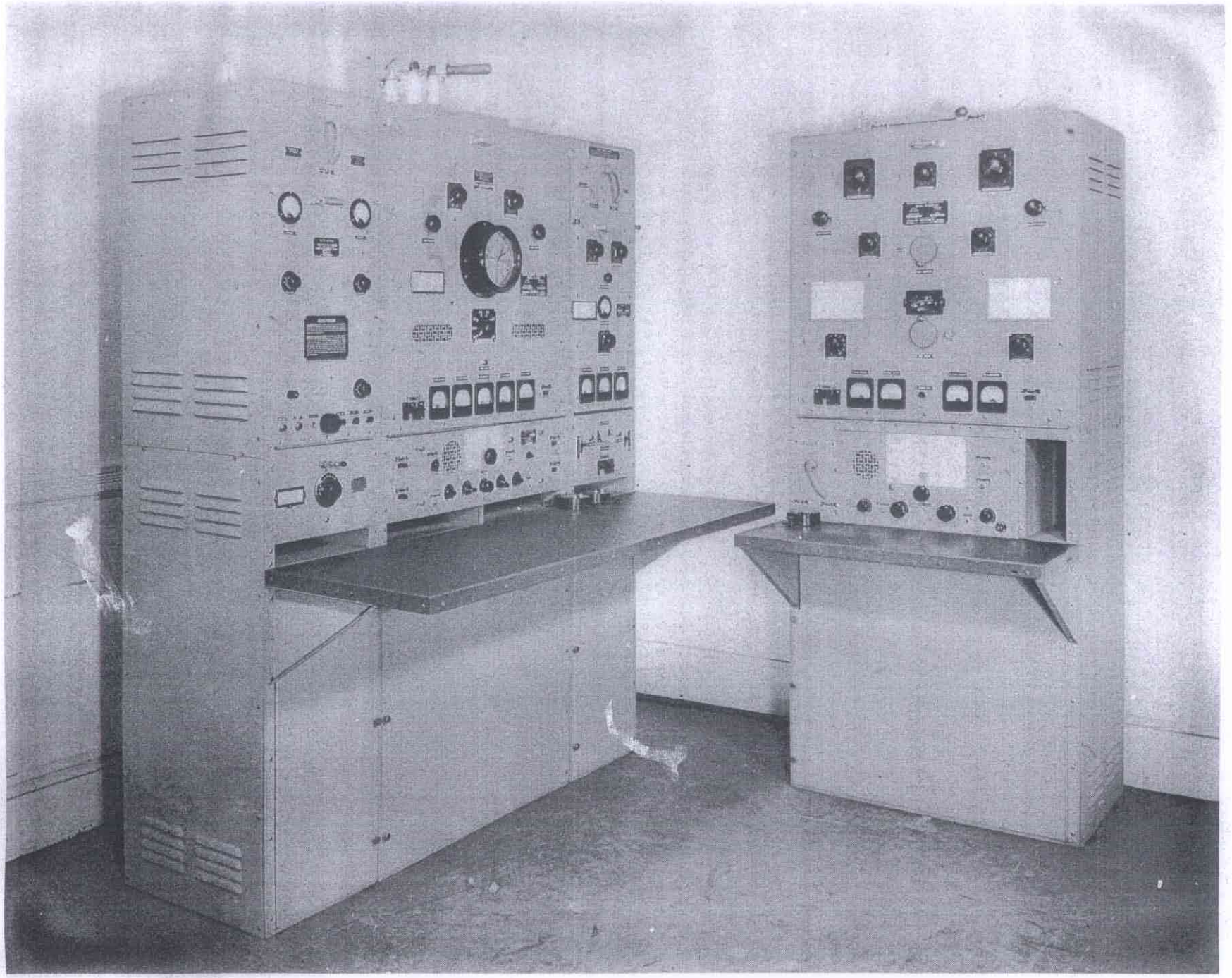

FIGURE 1 - ET-8023-D1 TRANSMITTER WITH MODEL 3U

SECTION 1
OPERATING INSTRUCTIONS

MODEL ET-8023-D1
HIGH FREQUENCY
RADIOTELEGRAPH TRANSMITTER

FREQUENCY RANGE

The ET-8023-D1 transmitter is designed to cover, by means of front panel adjustments, a continuous frequency range of 2000 to 24,000 K.C. (2-24 M.C.). This frequency range more than covers the requirements of the U. S. Maritime Commission of 2000 to 18,100 K.C., without gaps, so as to provide an integrated service between the Merchant Fleet and the U. S. Navy.

The complete frequency range of 2000 to 24,000 K.C. is divided into nine bands as listed below. Suitable overlap is provided so that the lowest and highest frequencies listed in each band may also be obtained in the adjacent band.

BAND	OUTPUT FREQUENCY
1	2000 - 2670
2	2670 - 3560
3	3560 - 4750
4	4750 - 6340
5	6340 - 8440
6	8440 - 11270
7	11270 - 15000
8	15000 - 20000
9	20000 - 24000

In the ET-8023-D1 transmitter, the oscillator circuit is designed to cover the frequency band of 1500 to 3000 K.C. The fundamental, second, third, fourth, sixth, or eight harmonic of the oscillator frequency is used to obtain the final output frequency. This circuit arrangement permits maximum economy in the number of crystals required for several output frequencies as described further under "Frequency Control".

ANTENNA POWER

The transmitter is designed to deliver to a suitable antenna the power listed below:

FREQUENCY RANGE	EMISSION	POWER
2000 - 17000 K.C.	A-2	225 Watts
2000 - 17000 K.C.	A-1	180 Watts
17000 - 18100 K.C.	A-2	200 Watts
17000 - 18100 K.C.	A-1	160 Watts
18100 - 24000 K.C.	A-2	180 Watts
18100 - 24000 K.C.	A-1	150 Watts

TYPE OF ANTENNA

The ET-8023-D1 transmitter is designed to operate into the normal "Main Antenna" used aboard ship for intermediate frequencies. In other words, no special short wave antenna is required. On vessels which are fitted with a separate "Emergency Transmitting Antenna" with conventional antenna switching means for such antenna, the ET-8023-D1 transmitter may also be operated into that antenna.

TYPE OF EMISSION

The transmitter is designed to provide A1 (Continuous Wave) and A-2 (Modulated Wave) emission. For A-2 emission the modulation frequency is approximately 500 cycles and the modulation percentage not less than 70 percent nor more than 100 percent.

FREQUENCY CONTROL

The transmitter is designed so that it may be operated either as a master oscillator type of transmitter or as a crystal controlled transmitter. A frequency tolerance of 0.02 percent with crystal control or 0.05 percent with master oscillator control is provided.

Provision is made for a maximum of ten type R1 Quartz crystals. Only four crystals are required to provide one calling and one working frequency in each of the eight marine bands listed below:

4140 - 4165 K.C.	11020 - 11070 K.C.
5510 - 5535 K.C.	12360 - 12480 K.C.
6210 - 6240 K.C.	16500 - 16660 K.C.
8240 - 8330 K.C.	22025 - 22140 K.C.

For example, the use of four crystals, 2070, 2080, 2760 and 2765 K.C. will provide the following calling and working frequencies:

Crystal Frequency K.C.	Output Frequencies in K. C.				
	No. 1	No. 2	No. 3	No. 4	No. 5
2070 (c)	4140	6210	8280	12420	16560
2080 (w)	4160	6240	8320	12480	16640
2760 (c)	5520	11040	16560	22080	-----
2765 (w)	5530	11060	16590	22120	-----

(c) Equals Calling Frequency
(w) Equals Working Frequency

The above list shows how the four crystals will provide eight calling and nine working frequencies, totaling seventeen frequencies in the eight standard marine bands. It will be noted that the calling frequency of 16560 K.C. is obtained either with 2070 or 2760 crystal.

VACUUM TUBES

The transmitter uses a total of five vacuum tubes as follows:

1 - RCA-1624 as Crystal or Master Oscillator
1 - RCA-1624 as First Buffer Amplifier or Frequency Multiplier
1 - RCA-1624 as Second Buffer Amplifier or Frequency Multiplier
2 - RCA-813 as Power Amplifier

TYPE OF CIRCUIT

The general circuit arrangement is shown on drawing T-1282 enclosed. The oscillator frequency is controlled by means of a continuously variable inductor for the band of 1500 to 3000 K.C. The oscillator inductor is provided with a Veeder-Root Counter and a 6-3/4 inch diameter Vernier Scale so that a high degree of reset accuracy may be obtained. A panel control switch in the oscillator circuit permits selection of any one of the crystals, or instant change to master oscillator operation.

A ganged nine position frequency switch is used to simultaneously select the appropriate values of inductance in the first buffer, second buffer and power amplifier tank circuit. The variable tuning capacitors in the first and second buffers are also ganged for quick and convenient adjustment. A separate variable tuning capacitor is provided for resonating the power amplifier tank circuit.

Coupling between the power amplifier tank and antenna circuits is obtained by means of panel controls which may be adjusted to insert various values of inductance, or capacitance, or both, so that the power amplifier tubes may be loaded into shipboard antennas whose characteristic impedance varies over wide limits between 2000 and 24,000 K.C.

For keying the transmitter, a quick acting keying relay is employed which is arranged to key all stages in the transmitter. For A-2 emission, a suitable modulation transformer is built into the transmitter for modulating the power amplifier plate circuit. The primary of the modulation transformer obtains its input from a 500 cycle generator, the latter being a part of the main motor generator, as explained further in this book.

POWER SUPPLY

For shipboard installations where the ship's power supply is 115 volts D.C., and where the ET-8023-D1 transmitter is installed in conjunction with a model 3U, no additional motor generator is required. An M. G. transfer switch in frame D1, which includes the model ET-8023-D1, is used to transfer the motor generator circuits either to the ET-8023-D1 transmitter, or ET-8024 intermediate frequency transmitter.

Attention is invited to the fact that the ET-8023-D1 transmitter assembly provides for complete control of the motor generator unit already available with the ET-8024 transmitter. In other words, the ET-8023-D1 panel provides for adjustment of filament and plate voltage from the motor generator, as well as adjustment of the power output by means of the plate voltage control. Filament and plate voltmeters are provided on the ET-8023-D1 panel, as well as plate current and P. A. grid meters.

PANEL CONTROLS AND INSTRUMENTS

1 - Test Key
2 - A1-A2 Switch
3 - On-Off Switch
4 - Crystal-Master Oscillator Switch
5 - Band Switch
6 - Antenna Switch
7 - Oscillator Tuning
8 - Buffer Tuning
9 - P. A. Tuning
10 - Antenna Capacitor
11 - Antenna Inductor
12 - Coupling
13 - Plate Rheostat
14 - Filament Rheostat
15 - P. A. Grid Milliammeter
16 - Cathode Current Ammeter
17 - Filament Voltmeter
18 - Plate Voltmeter
19 - Dial Light
20 - Calibration Charts

NOTE ON TELEGRAPH KEYS

When model ET-8023-D1 is used in conjunction with the model 3U, either of two telegraph keys may be used. For example, when the Motor Generator Transfer Switch is placed in position 1 (left hand position), to use the high frequency transmitter, the telegraph key beneath this switch may be used or, if desired, the Main telegraph key on the model 3U may be used. Likewise, these same two keys may be used when the Motor Generator Transfer Switch is placed in position 2 (ET-8024) when the model 3U is to be used. The keys are automatically transferred through the circuits of the Motor Generator Transfer Switch.

IMPORTANT

The special attention of the radio operator is directed to the "Tuning Instructions" which follow:

As a part of the ET-8023-D1 instructions, there are included in this book an oscillator calibration curve and typical tuning charts which should be carefully studied by the operator.

TUNING INSTRUCTIONS

The CRYSTAL SWITCH has eleven positions. The first ten positions are used to select the appropriate crystal. The eleventh position is to provide master oscillator operation. Normally the ET-8023 transmitter is furnished with four crystals, 2070, 2080, 2760 and 2765 K.C. These four crystals are to be placed in crystal jacks 1, 2, 3 and 4 respectively, which will connect the 2070 K.C. crystal to position 1 and the 2765 crystal to position 4 on the CRYSTAL SWITCH. Switch positions 5 and 10 inclusive will not normally be used unless additional crystals are added in the future.

The Oscillator Tuning control actuates a rotating coil having 29 turns. A Veeder-Root Counter marked "A" is driven from the rotating coil shaft. This counter reads 000 for the lowest oscillator frequency and 280 for the highest oscillator frequency. The first two digits on the counter indicate complete turns. The third or right hand digit indicates "tenths" of a turn. A 0-360 division dial marked "B" is connected directly to the rotating shaft of the oscillator coil. Therefore, the oscillator calibration for any frequency is recorded by means of counter "A" and dial "B".

Movement of dial "B" every 36 divisions (one tenth of a coil turn) causes counter "A" to change by one digit. Inherent backlash in the counter gears will allow a small variation in the second and third digit. However, this will not result in any error in the oscillator calibration because dial "B" accurately determines fractional positions of the rotating coil. To understand this note the following examples:

Figs. 1 and 2: Dial "B" is at zero. Counter "A" may be recorded and used either at 179 or 180.

Figs. 3 and 4: Dial "B" is at 75. Counter "A" may be recorded and used either at 171 or 172.

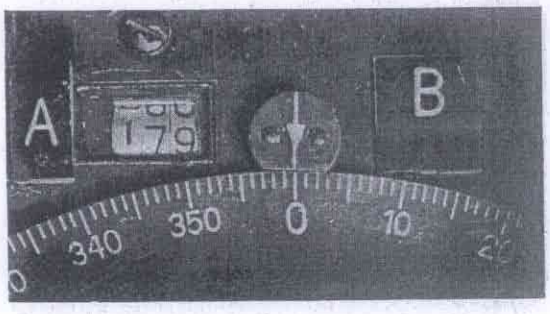

FIG. 1

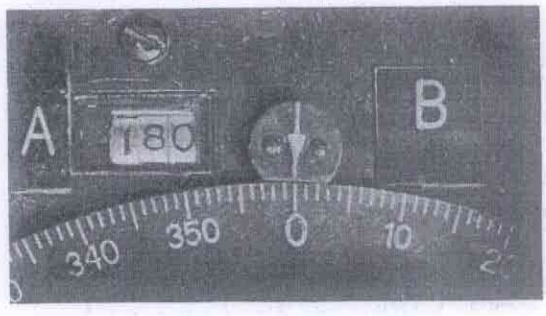

FIG. 2

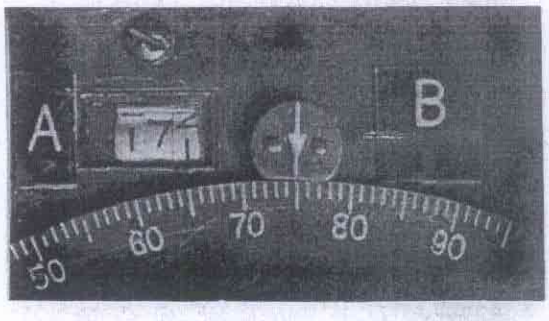

FIG. 3

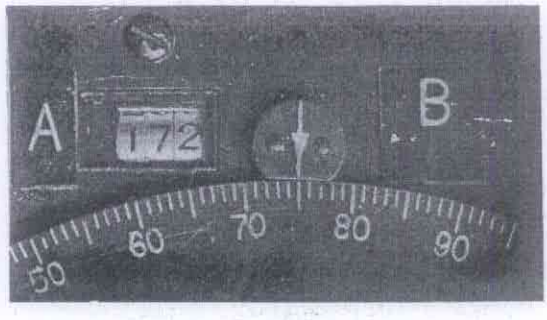

FIG. 4

For the seventeen output frequencies which are provided by the four standard crystals, refer to the calibration chart shown below. A duplicate of this chart is mounted on the transmitter panel, and the last five columns (P. A. Tuning, Coupling, etc.) are to be filled in by the installation personnel who will determine the appropriate settings at the time of installation. Instructions for determining the correct settings for the last five columns of the chart are given further in this book.

OUTPUT FREQ. KC	BAND SW.	XTAL. SW.	OSC. TUNING		BUF. TUN.	PA. TUN.	COUP.	ANT. SW.	ANT. CAP.	ANT. IND.
			A	B						
4140	3	1	173	120	26					
4160	3	2	175	180	26					
5520	4	3	251	51	29					
5530	4	4	251	67	29					
6210	4	1	173	120	38					
6240	4	2	175	180	39					
8280	5	1	173	120	35					
8320	5	2	175	180	35					
11040	6	3	251	51	35					
11060	6	4	251	67	35					
12420	7	1	173	120	23					
12480	7	2	175	180	23					
16560	8	3	251	51	22					
16590	8	4	251	67	22					
16640	8	2	175	180	23					
22080	9	3	251	51	27					
22120	9	4	251	67	27					

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The Tuning Key located below the oscillator control should always be used to key the transmitter when making adjustments. This will prevent overload on the tubes during periods when the P. A. Tuning, Coupling, etc. may be out of adjustment.

To place the ET-8023-D1 transmitter on the air, proceed as follows (when used with model 3U radio unit):

1 - On model 3U radio unit, place Auto Alarm Master Switch in position 3 (transmitting position). Also place the RM-15 Antenna Switch at the top of model 3U in the left hand position, if the Main Antenna is to be used, or in the right hand position, if the Emergency Antenna is to be used.

2 - Place Antenna Transfer Switch at the top of the frame in the right hand position (High Frequency ET-8023).

3 - Place Motor Generator Transfer Switch in ET-8023 position (left hand position).

4 - Start motor generator and adjust filament voltage to 10 and plate voltage to 1400.

5 - Place Emission Switch in A-1 position (Continuous Waves).

6 - Determine output frequency desired and set the Band Switch, Crystal Switch, Oscillator Tuning "A" and "B" and Buffer Tuning, from the calibration card.

7 - Now press Tuning Key and readjust Buffer Tuning slightly until the P. A. Grid Current meter reads maximum. The correct setting for the Buffer Tuning should be reasonably close to the value shown on Tuning chart.

8 - Now set P. A. Tuning, Coupling, Antenna Switch, Antenna Capacitor and Antenna Inductor from the Tuning chart. Then slightly re-adjust P. A. Tuning for minimum current as read on the P. A. Cathode Current Meter. The P. A. Grid Current will increase when P. A. Tuning is adjusted for minimum Cathode Current. The calibrated setting of the Antenna Inductor is indicated by a Veeder-Root Counter to the left of the Antenna Inductor control.

9 - The normal telegraph key should then be closed, which will cause the transmitter to draw its normal full load and which will give a minimum P. A. Cathode Current between approximately 3/10 to 4/10 amp. Lower plate voltage if flashover is observed.

10 - After the transmitter has been correctly adjusted as outlined above for A1 emission (continuous waves), the Emission Switch may be thrown to the A2 position if transmission is desired using modulated wave output.

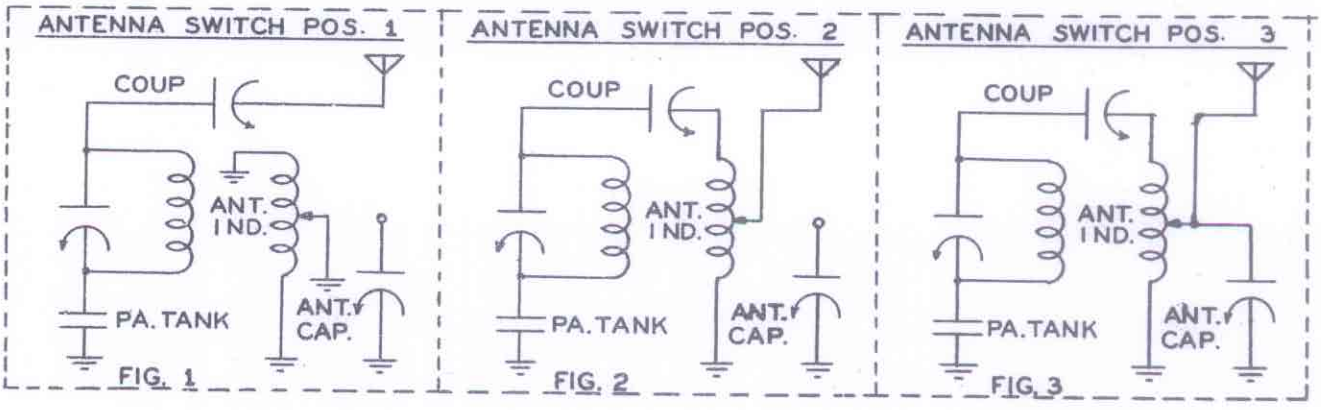
11 - When through using the ET-8023-D1 and to restore the antenna circuits to their normal condition for intermediate frequency operation, place the Antenna Transfer Switch on the ET-8023-D1 to the left hand position marked "Intermediate Frequency and D. F. Position". It should be noted that this switch interlocks the direction finder circuits, and, for this reason, it must be placed in the left hand position whenever the direction finder is to be used, or when the model 3U is to be used. In addition, the Motor Generator Transfer Switch should be returned to the ET-8024 position 2 to restore the model 3U radio unit to its normal operating conditions.

ADDITIONAL INSTRUCTIONS FOR INSTALLATION PERSONNEL

In the instructions which follow details are given outlining the correct procedure for adjusting the ET-8023-D1 output circuit, the adjustment of the oscillator circuit for crystal or master oscillator operation, and the use of additional charts for setting up the transmitter to frequencies other than those listed on the transmitter panel tuning chart. Always use low plate voltage (less than 1400 volts) when making output circuit adjustments described on the following pages.

ET-8023-D1 OUTPUT CIRCUIT

The following diagrams show the three antenna circuit combinations which can be selected with the Antenna Switch on the front panel of the ET-8023-D1 transmitter:



The Antenna Switch position to be used will be determined by the antenna and the frequency. However, it is suggested that the transmitter be calibrated for the lowest Antenna Switch position that will permit the transmitter to load into the antenna.

Fig. 1 shows the Antenna Capacitor and the Antenna Inductor disconnected from the antenna circuit. The slider and both ends of the Antenna Inductor are grounded to prevent the Antenna Inductor from resonating with stray capacities at the higher frequencies. The Antenna Switch in position 1 places the Coupling Capacitor in series with the antenna.

To load transmitter with Antenna Switch in position 1:

1 - Set Coupling at 25 (half scale)

2 - Set Antenna Inductor at 222

3 - Adjust P. A. Tuning for minimum Cathode Current. If minimum Cathode Current is less than .3 amp, reset Coupling to a higher number and readjust P. A. Tuning for minimum Cathode Current. Set Coupling to a lower number if minimum Cathode Current is more than .4 amp.

If the transmitter will not load properly with any setting of the Coupling, it will be necessary to try position 2 of the Antenna Switch.

Fig. 2 shows the antenna connected to the slider on the Antenna Inductor. The counter dial geared to the Antenna Inductor reads 000 to 444. When this dial reads 000, the slider is at the end of the inductor which connects to the Coupling Capacitor.

To load transmitter with Antenna Switch in position 2:

1 - Set Coupling at 25 (half scale)

2 - Set Antenna Inductor at 000.

3 - Adjust P. A. Tuning for minimum Cathode Current. If minimum Cathode Current is less than .3 amp, or more than .4 amp, reset Antenna Inductor to 010 or 020 and readjust P. A. Tuning for minimum Cathode Current. Repeat this operation as often as necessary using higher numbers of the Antenna Inductor each time to get the desired Cathode Current. Once the approximate setting of the Antenna Inductor is obtained, the Antenna Inductor can be calibrated at some whole number and the Coupling Capacitor adjusted for the exact loading.

Fig. 3 shows the Antenna Capacitor connected in parallel with the whole or part of the Antenna Inductor, depending on the position of the slider.

To load transmitter with Antenna Switch in position 3:

1 - Set Coupling at 25 (half scale)

2 - Set Antenna Inductor at 000.

3 - Set Antenna Capacitor at 25.

4 - Adjust P. A. Tuning for minimum Cathode Current. If minimum Cathode Current is less than .3 amp, reset the Antenna Inductor to a higher number and readjust P. A. Tuning for minimum Cathode Current. Repeat this operation as often as necessary using higher numbers on the Antenna Inductor each time. For frequencies near 2 MC, it may be necessary to set Antenna Capacitor at 40 to 50 instead of 25 as shown above. The Antenna Capacitor should be set preferably less than 25 for frequencies above 10 MC. Once the approximate setting of the Antenna Inductor is obtained, the Antenna Inductor can be calibrated at some whole number and the Coupling Capacitor or Antenna Capacitor can be adjusted for the exact loading.

With the Antenna Switch in position 3, extremely high voltages can be built up in the resonant circuit formed by the Antenna Inductor and the Antenna Capacitor. This is especially pronounced when the transmitter is not loaded such as could happen when the antenna is not connected to the transmitter. Damaged insulation may result if these voltages were allowed to persist. If there is any indication of flash-over in the antenna circuit components, it is advisable to try new settings of the Antenna Inductor, Antenna Capacitor or Coupling. Use lower plate voltage if necessary.

GENERAL CALIBRATION DATA

Refer to charts "General Calibration Data" which show the oscillator frequency (or crystal frequency) for various output frequencies between 2000 and 24,000 K.C. These charts also show the settings of the nine position Band Switch and the approximate settings of the Buffer Tuning and P. A. Tuning. The P. A. Tuning settings are for reference purposes only, as they are recorded with no antenna connection (transmitter unloaded) and different P. A. Tuning adjustments will be needed when the transmitter is loaded into the antenna. The charts also show the approximate settings of Oscillator Tuning for Master Oscillator or Crystal Control Operation.

TYPICAL OSCILLATOR CALIBRATION CURVE

Refer to the "Typical Oscillator Calibration Curve" (in the back of this book) to determine the approximate settings of oscillator frequency in terms of the reading on counter "A". For final calibrations, for master oscillator operation, a precision frequency meter should be used and a record made of counter "A", and also of dial "B".

When crystal operation is required, reference should be made to the "General Calibration Data" which lists the recommended settings of counter "A" and dial "B" for all of the allocated marine frequencies, as well as for other frequencies. When using crystals the best settings for counter "A" and dial "B" should be verified by listening to a C. W. signal from the transmitter, with the high frequency receiver, taking care not to overload the latter. If the oscillator tuning with crystal control is incorrect, the keying will not be "clean" when the transmitter is keyed rapidly. A slight readjustment of the oscillator control will quickly disclose the best setting.

OSCILLATOR ALIGNMENT

The following adjustment procedure is made at the factory and should not be disturbed unless major repairs or replacements are required in any of the oscillator components:

The oscillator alignment frequency is 3000 K.C. with counter "A" adjusted to 270 and dial "B" to 5. Crystal switch should be in M. O. position. A precision frequency meter adjusted to 3000 K.C. should be used. Then loosen locknut on variable condenser C-732 which is located at left side of oscillator compartment and adjusted through the opening below the crystal mounting panel. C-732 should then be very carefully adjusted, using an insulated screwdriver, for 3000 K.C., without disturbing the setting of counter "A" at 270 and dial "B" at 5. Condenser locknut should then be tightened.

Use low plate voltage and keep clear of live circuits when making oscillator adjustment. The moving slider of the oscillator rotating coil must not be displaced. This slider should be against the rear stop (29th turn) when counter "A" reads between 289 and 290.

ET-8023-D1 H. F. TRANSMITTER

Chart to show Master Oscillator or Crystal Frequency required for standard F. C. C. marine bands.

OSC. OR CRYSTAL FREQUENCY	OUTPUT FREQUENCY	OUTPUT FREQUENCY	OUTPUT FREQUENCY	OUTPUT FREQUENCY	OUTPUT FREQUENCY
2060			8240	12360	16480
2062.5			8250	12375	16500
2065			8260	12390	16520
*2070	4140c	6210c	8280c	12420c	*16560c
2073.333		6220		12440	
2075	4150		8300	12450	16600
2076.666		6230		12460	
*2080	4160	6240	8320	12480	16640
2082.5	4165		8330		16660
2753.125					22025
2755	5510		11020	16530	22040
2756.25	5512.5		11025		22050
2757.5	5515		11030		22060
2759.375					22075
*2760	5520c		11040c	*16560c	22080c
2762.5	5525		11050	16575	22100
2763.75	5527.5		11055		22110
*2765	5530		11060	16590	22120
2765.625					22125
2767.5	5535		11070	16605	22140

c - Calling Frequency

* - This Frequency obtained with both 2070 and 2760 K. C. Crystals

GENERAL CALIBRATION DATA

Dial Settings for M. O. Operation are approximate

P. A. Tuning calibration was taken with antenna disconnected, antenna switch position 1, antenna coupling 25 and antenna inductance 222.

OUTPUT FREQ. KC	BAND SW.	OSC. OR CRYSTAL FREQ.	M. O. OSC. TUNING A	M. O. OSC. TUNING B	CRYSTAL OSC. TUNING A	CRYSTAL OSC. TUNING B	BUFFER TUNING	P. A. TUNING
1900	1	1900	141	46	143	134	13	10
2000	1	2000	159	360	162	72	17	14
2200	1	2200	190	18	192	90	27	24
2400	1	2400	215	191	217	252	34	32
2600	1	2600	236	218	237	270	38	37
2800	1	2800	253	133	254	170	43	42
3000	1	3000	270	5	270	26	45	45
2600	2	2600	236	218	237	270	12	11
2800	2	2800	253	133	254	170	22	20
3000	2	3000	270	5	270	26	28	26
3400	2	1700	94	167	96	281	38	36
3800	2	1900	141	46	143	134	41	40
4000	2	2000	159	360	162	72	47	45
3400	3	1700	94	167	96	281	7	2
3800	3	1900	141	46	143	134	19	14
4000	3	2000	159	360	162	72	24	23
4140	3	2070	171	46	173	120	26	26
4150	3	2075	172	74	174	150	26	26
4160	3	2080	172	106	175	180	26	26
4165	3	2082.5	173	130	175	206	27	27
4400	3	2200	190	18	192	88	31	31
4800	3	2400	215	191	217	252	37	37
5200	3	2600	236	218	237	270	43	43
4400	4	2200	190	18	192	88	2	2
4800	4	2400	215	191	217	252	15	14
5200	4	2600	236	218	237	270	23	22
5510	4	2755	249	354	251	35	29	27
5512.5	4	2756.25	249	358	251	39	29	27
5515	4	2757.5	250	2	251	43	29	27
5520	4	2760	250	10	251	51	29	27
5525	4	2762.5	250	18	251	59	29	27
5527.5	4	2763.75	250	22	251	63	29	27
5530	4	2765	250	26	251	67	29	27
5535	4	2767.5	250	34	252	75	29	27
5800	4	2900	261	74	262	106	33	31
6210	4	2070	171	46	173	120	38	36
6220	4	2073.33	171	66	173	140	38	36
6230	4	2076.66	172	86	174	160	39	37
6240	4	2080	172	106	175	180	39	37
6600	4	2200	190	18	192	88	43	41
7000	4	2333.33	207	268	209	326	47	45

GENERAL CALIBRATION DATA

Dial Settings for M. O. Operation are approximate

P. A. Tuning calibration was taken with antenna disconnected, antenna switch position 1, antenna coupling 25 and antenna inductance 222.

OUTPUT FREQ. KC	BAND SW.	OSC. OR CRYSTAL FREQ.	M. O. OSC. TUNING A	M. O. OSC. TUNING B	CRYSTAL OSC. TUNING A	CRYSTAL OSC. TUNING B	BUFFER TUNING	P. A. TUNING
6000	5	1500	29	360	33	120	4	12
6600	5	1650	80	28	83	132	15	21
7200	5	1800	119	360	122	86	23	29
8000	5	2000	159	360	162	72	32	37
8240	5	2060	169	352	171	66	34	39
8250	5	2062.5	169	358	171	72	34	39
8260	5	2065	170	17	172	85	34	39
8280	5	2070	171	46	173	120	35	40
8300	5	2075	172	74	174	150	35	40
8320	5	2080	172	106	175	180	35	40
8330	5	2082.5	173	130	175	206	35	40
8600	5	2150	183	127	185	296	38	43
9000	5	2250	197	264	199	356	42	46
8000	6	2000	159	360	162	72	3	11
8600	6	2150	183	127	185	296	12	19
9000	6	2250	197	264	199	356	17	23
9600	6	2400	215	191	217	252	23	29
11020	6	2755	249	354	251	35	35	38
11025	6	2756.25	249	358	251	39	35	38
11030	6	2757.5	250	2	251	43	35	38
11040	6	2760	250	10	251	51	35	38
11050	6	2762.5	250	18	251	59	35	38
11055	6	2763.75	250	22	251	63	35	38
11060	6	2765	250	26	251	67	35	38
11070	6	2767.5	250	34	252	75	35	38
12000	6	3000	270	5	270	26	43	45
11000	7	1833.33	127	260	129	166	11	18
12360	7	2060	169	352	171	66	23	28
12375	7	2062.5	169	358	171	72	23	28
12390	7	2065	170	17	172	85	23	28
12420	7	2070	171	46	173	120	23	28
12440	7	2073.33	171	66	173	140	23	28
12450	7	2075	172	74	174	150	23	28
12460	7	2076.66	172	86	174	160	23	28
12480	7	2080	172	106	175	180	23	28
13000	7	2166.66	185	209	187	280	27	32
15000	7	2500	226	216	227	270	38	42
16000	7	2666.66	242	80	243	126	43	47

GENERAL CALIBRATION DATA

Dial Settings for M. O. Operation are approximate

P. A. Tuning calibration was taken with antenna disconnected, antenna switch position 1, antenna coupling 25 and antenna inductance 222.

OUTPUT FREQ. KC	BAND SW.	OSC. OR CRYSTAL FREQ.	M. O. OSC. TUNING A	M. O. OSC. TUNING B	CRYSTAL OSC. TUNING A	CRYSTAL OSC. TUNING B	BUFFER TUNING	P. A. TUNING
14000	8	2333.33	207	268	209	326	6	8
15000	8	2500	226	216	227	270	14	15
16480	8	2060	169	352	171	66	22	24
16500	8	2062.5	169	358	171	72	22	24
16520	8	2065	170	17	172	85	22	24
16530	8	2755	249	354	251	35	22	24
16560	8	2070	171	46	173	120	22	24
16560	8	2760	250	10	251	51	22	24
16575	8	2762.5	250	18	251	59	22	24
16590	8	2765	250	26	251	67	22	24
16600	8	2075	172	14	174	150	23	25
16605	8	2767.5	250	34	252	75	23	25
16640	8	2080	172	106	175	180	23	25
16660	8	2082.5	173	130	175	206	23	25
18000	8	2250	197	264	199	356	30	32
20000	8	2500	226	216	227	270	38	41
22000	8	2750	249	339	250	18	45	48
18000	9	2250	197	264	199	356	16	19
20000	9	2500	226	216	227	270	26	29
22025	9	2753.12	249	349	250	28	27	30
22040	9	2755	249	354	251	35	27	30
22050	9	2756.25	249	358	251	39	27	30
22060	9	2757.5	250	2	251	43	27	30
22075	9	2759.37	250	8	251	49	27	30
22080	9	2760	250	10	251	51	27	30
22100	9	2762.5	250	18	251	59	27	30
22110	9	2763.75	250	22	251	63	27	30
22120	9	2765	250	26	251	67	27	30
22125	9	2765.62	250	28	251	69	27	30
22140	9	2767.5	250	34	252	75	27	30
23000	9	2875	260	2	260	34	27	30
24000	9	3000	270	5	270	26	39	43

SECTION 2
INSTALLATION INSTRUCTIONS

MODEL ET-8023-D1
HIGH FREQUENCY
RADIOTELEGRAPH TRANSMITTER

1 - The installation of the ET-8023-D1 in conjunction with model 3U radio unit requires a careful study of these instructions, the circuit diagrams, and the photographs which are enclosed. This point is emphasized because it is necessary to mount an adapter terminal block assembly and to modify the wiring in the lower section of frame B in the model 3U.

2 - Refer to TS-447 which shows the overall radio room layout, the 28 conductor lead and armored interconnecting cable and the copper tubing between the top of the 8023-D1 and the model 3U. The steel foundation shown on TS-447 should previously have been installed so that the ET-8023-D1 may be bolted to it. Six 1/2" X 13 X 1-1/2" bolts with nuts and lock washers should be used to fasten the frame to the steel foundation. See KS-270 for ET-8023-D1 overall dimensions and mounting dimensions. Also refer to photo in Figure 1 which shows the relative location of the ET-8023-D1 with respect to the model 3U.

3 - Refer to drawing T-1260 which shows the interconnections between the ET-8023-D1 and the model 3U. The standard 3U, frame B, diagram T-1148 is also included in this book for convenient reference. Also refer to photographs shown in Figures 2 and 3. These two photographs show the wiring as it will appear in the lower section of frame B (3U) after the modifications outlined below have been made.

4 - Mount the adapter terminal block (two 12 terminal Burke) and cable assembly. To do this remove the two lower rear bolts that hold frame B to frames A and C. Mount the terminal block assembly using two 5/16" X 16 X 7/8" long bolts to hold it. Hardware is supplied in accompanying kit. Adapter block is shown in Figure 7.

5 - Unlace frame B cable harness starting at the M. G. terminals and terminating at the bend over terminal block 23-24-25-26.

6 - Remove the following wires from the M. G. Terminal block and fuses, and connect them to the adapter terminal block as follows:

Color Code	Old Location (T-1148)	New Location (T-1260)
Green-Red	F3, M.G.	#43 Adapter Term. Block
Yellow-Black	F2, M.G.	#44 Adapter Term. Block
Black-Blue	A3, M.G.	#45 Adapter Term. Block
Green	#2, M.G. Starter	#38 Adapter Term. Block
Blue-Red	Top, F-203 (H.V.Fuse)	*#34 Adapter Term. Block
Brown	Top, F-202 (3 A Fuse)	#46 Adapter Term. Block
Black-Yellow	Top, F-201 (3 A Fuse)	#47 Adapter Term. Block

* The G. E. medium cup terminal (supplied in kit) should be soldered to this wire before connecting the wire to the terminal block.

7 - Connect the remaining 15 loose wires (free ends) from the adapter cable harness. These wires are coded to correspond to the terminals to which they connect, as follows:

Code	Connect Free End To	From
A2, MS	A2 M. G. Starter	#41, Adapter Block
2, MS	#2, M. G. Starter	#42, Adapter Block
F-203	Top, F-203 (H.V.Fuse)	#30, Adapter Block (See Note 1)
F-202	Top, F-202 (3 A Fuse)	#31, Adapter Block
F-201	Top, F-201 (3 A Fuse)	#32, Adapter Block
M2, MG	M2, M. G.	#37, Adapter Block
A3, MG	A3, M. G.	#28, Adapter Block
F2, MG	F2, M. G.	#27, Adapter Block
F3, MG	F3, M. G.	#29, Adapter Block
T2, MG	T2, M. G.	#40, Adapter Block
SPLICE	Splice to Brown-Green wire removed from key	#39, Adapter Block (See Note 2)
Key	Key	#35, Adapter Block)
Key	Key	#36, Adapter Block) (See Note 3)
A40	#40, Frame A	#33, Adapter Block)
A41	#41, Frame A	#36, Adapter Block) (See Note 4)

Note 1: Make Solder Connection to fuse F-203

Note 2: Remove Brown-Green and Red coded leads from key and pull through hole in message compartment. Connect Brown-Green wires to lead marked "Splice", with screw and nut supplied from kit. Tape splice. Tape unused Red wire removed from key.

Note 3: Feed these two leads through hole in message compartment and connect to 8024 key.

Note 4: Remove and discard Red and Black jumper wires between #40 and #41 frame "A", and #17 and #18 frame "B".

8 - Lace portion of frame interconnection cable that was unlaced in frame B.

9 - Remove green wire from terminal #21, frame C, and connect to terminal #22, frame C.

10 - Remove lower rear panel (kickplate) from frame C. Replace with new panel and 2 inch pipe elbow. See photo, figure 4. Adjust elbow using locknuts so that elbow may be clamped to bulkhead

11 - Install the lead and armored cable and feed ends through 2 inch pipe elbow in frame C and Chase nipple in frame D1. The ends of the cables are labeled to show the frame to which they connect and the individual wires in the cable are coded to correspond to the terminals to which they connect. Clamps are supplied on the lower rear panel of frame D1 for securing the stripped portion of cable. See photo, Figure 6. The 28 conductor cable is a temporary laboratory cable. In practice, the special 28 conductor lead and armored cable is to be used. Clamps are also supplied for securing the pipe elbow and the cable to the bulkhead.

12 - Now refer to TS-447 and run the two lengths of 3/8" copper tubing for the antenna circuits as shown. It is necessary on model 3U to remove the jumper connection between the blade of the RM-15 Main and Emergency Antenna Switch and the stud of the right rear insulator at the top of frame B.

13 - On vessels already equipped with model AR-8506-B radio receiver, it is necessary to remove this receiver from its cabinet and install it in the space provided in the ET-8023-D1. An RM-8 Filter Unit complete with 2 conductor shielded cable and plug will be found already mounted in the lower section of ET-8023-D1. The doublet antenna should then be connected to the AR-8506-B using the 15 foot length of #772 shielded cable which is to be brought out of the top of the ET-8023-D1 frame.

14 - On vessels where a model SLR-F radio receiver is already installed, this receiver is to be removed from its cabinet and installed in the high frequency frame. Refer to drawing X-103 which shows the external connections for the SLR-F when used either with a vibrator power supply or a rotary converter. When a rotary converter is used, it is necessary to install in some location convenient to the operator a catalog #31322, two pole, fused line switch, which is to be used for starting or stopping the rotary converter. The rating of the fuse required in this switch will depend upon the starting current required by the machine which is estimated at 10 amperes. Note that the RM-8 Line Filter when used with model SLR-F is connected in the A. C. input circuit of the receiver and not in the D. C. input of the vibrator or rotary converter unit. A mounting plate for the vibrator or rotary converter is provided in the base of the ET-8023-D1 frame. For connecting the doublet antenna to the SLR-F receiver, on Liberty ships, Radiomarine offices will furnish from their stock a right angle plug, American Phenolic Corporation AN-3108-126-3D with AN-3057-Y cable clamp. This right angle plug is to be used to fit in the narrow space between the rear of the SLR-F chassis and the back of the high frequency transmitter. A small filler strip above the receiver furnished with each frame is to be removed when the SLR-F is installed, but is to be retained when AR-8506-B is used.

15 - With either type of high frequency receiver, sufficient slack should be left in the antenna and power leads so that the chassis may be withdrawn from the front of the frame for replacement of tubes, etc.

16 - When the ET-8023-D1 is installed as an independent transmitter, with its own motor generator and automatic starter, refer to T-1282. The photograph in Figure 5 shows the motor generator, starter, etc. as they would be mounted for an independent installation. Normally for such independent installations the complete unit would be shipped, assembled at the factory, with the motor generator, starter, additional fuse block, etc. The Antenna Transfer Switch and the Direction Finder Interlock circuit in independent installations must be connected to suit local conditions.

17 - After the installation has been made as outlined above, the ET-8023-D1 should be loaded into the Main and Emergency Antennas and the proper settings recorded on the calibration cards as described under "Operating Instructions".

18 - The installation man should next check the operation of the model 3U using the Motor Generator Transfer Switch and Antenna Transfer Switch in the ET-8023-D1 to verify that all interconnections have been made correctly.

19 - Operation of the high frequency receiver should also be checked after it has been installed in the ET-8023-D1. Whenever feasible, the radio operating personnel of the ship should be instructed how to handle the ET-8023-D1 by installation personnel at the time the new equipment is installed.

20 - Note Regarding ET-8023-D1 Operating Table: The small operating table should be fastened to the ET-8023-D1 frame using the two table brackets and the necessary bolts furnished in the bolt and hardware kit. The height of the operating table from the base of the frame is 28-1/2 inches on the ET-8023-D1 as compared to 29-3/4 inches height for the operating table on the model 3U. The ET-8023-D1 table is mounted lower on the frame to provide sufficient space for the SLR-F receiver, making it unnecessary to mount a special front panel on that receiver.

21 - It will, therefore, be normal for the operating table on the ET-8023-D1, when installed in the radio room, to be at a slightly lower level than the 3U operating table. The exact difference between the two table levels will be determined by deck camber and by the height of the steel foundations under the 3U and under the ET-8023-D1.

PARTS LIST
MODEL ET-8023-D1
RADIOTELEGRAPH TRANSMITTER

Reference Drawing T-1282

Symbol Desig.	Function	Rating
	CAPACITORS	
C-701	Osc. Fil. By-Pass	.004 mfd, 2500 V, Model NF, RCA
C-702	Osc. Fil. By-Pass	SAME AS C-701
C-703	Osc. Screen By-Pass	SAME AS C-701
C-704	Osc. Tank By-Pass	SAME AS C-701
C-705	1st Buff. Fil. By-Pass	SAME AS C-701
C-706	1st Buff. Fil. By-Pass	SAME AS C-701
C-707	1st Buff. Screen By-Pass	SAME AS C-701
C-708	1st Buff. Tank By-Pass	SAME AS C-701
C-709	2nd Buff. Fil. By-Pass	SAME AS C-701
C-710	2nd Buff. Fil. By-Pass	SAME AS C-701
C-711	2nd Buff. Screen By-Pass	SAME AS C-701
C-712	2nd Buff. Tank By-Pass	SAME AS C-701
C-713	P. A. Fil. By-Pass	SAME AS C-701
C-714	P. A. Fil. By-Pass	SAME AS C-701
C-715	P. A. Screen By-Pass	SAME AS C-701
C-716	P. A. Plate Blocking	SAME AS C-701
C-717	Keying	SAME AS C-701
C-718	1st Buff. Grid Coupling	.00005 mfd, 2500 V, Model NF, RCA
C-719	2nd Buff. Grid Coupling	SAME AS C-718
C-720	P. A. Grid Coupling	SAME AS C-718
C-721	Osc. Grid Coupling	SAME AS C-718
C-722	Osc. Tank	.0015 mfd, 3000 V, CM-65C-152-J, RCA
C-723	Osc. Tank	.00039 mfd, 3000 V, CM-65C-391-J, RCA
C-724	P. A. Tank By-Pass	.001 mfd, 5000 V, UC-3071, RCA
C-725	Grid Milliammeter By-Pass	.01 mfd, 600 V, B-10, Sangamo
C-726	Fil. V.M. By-Pass	SAME AS C-725
C-727	P. A. Cath. By-Pass	SAME AS C-725
C-728	Plate V.M. By-Pass	SAME AS C-725
C-729	Main Filter	2 mfd, 2000 V, 9CE5A51, GE
C-730	Main Filter	SAME AS C-729
C-731	Mod. Trans. Primary	SAME AS C-729
C-732	Osc. Tank Trimming	140 mmfd, Cardwell Type ZU-140-AS
C-733	1st Buffer Tank	150 mmfd, Cardwell type MT-150-GS with Shaft Ext. Front and Rear
C-734	2nd Buffer Tank	150 mmfd, Cardwell Type MT-150-GS
C-735	1st Buffer Tank Trimming	1 Plate RMCA Special
C-736	P.A. Tank Tuning	240 mmfd, Cardwell Type XE-240-XS
C-737	Antenna	SAME AS C-736
C-738	Coupling	40 mmfd, Cardwell Type XC-40-XS
C-739	P. A. Grid By-Pass	SAME AS C-701
C-740	Compensating	Type 34895, RCA
C-741	Compensating	SAME AS C-740
C-742	Feedback	3-12mmfd, type TS2A-NPO, Erie
C-743	P. A. Tank By-Pass	SAME AS C-724
C-744	Crystal Padding	.000025 mfd., 3,000 V, Sangamo type C

PARTS LIST
MODEL ET-8023-D1
RADIOTELEGRAPH TRANSMITTER

Reference Drawing T-1282

Symbol Desig.	Function	Rating
	INDICATING LAMPS	
I-701	Panel Lamp	Mazda #1141, 12 V, 21 C.P.
	RELAY AND TUNING KEY	
K-701	Keying Relay	SPDT, Struthers Dunn, Type CXB-212
K-702	Tuning Key	SPDT, Hart & Hegeman, #3392-A
	R. F. INDUCTORS	
L-701	1st Buff. Grid Choke	2.5 m.h, Super Elec. R-100-U
L-702	Osc. Plate Choke	SAME AS L-701
L-703	1st Buff. Parasitic Suppressor	Ohmite P-300
L-704	2nd Buff. Grid Choke	RMCA Dwg TS-346, Part 4
L-705	P. A. Grid Choke	RMCA Dwg TS-346, Part 4
L-706	P. A. Plate Choke	RMCA Dwg TS-346, Part 4
L-707	Antenna	RMCA Dwg TS-346, Part 2
L-708	Osc. Tank	RMCA Dwg TS-346, Part 1
L-709	1st Buff. Tank	RMCA Dwg TS-344, Part 4 and 5
L-710	2nd Buff. Tank	RMCA Dwg TS-344, Part 4 and 5
L-711	1st Buff. Tank	RMCA Dwg TS-344, Part 3
L-712	1st Buff. Tank	RMCA Dwg TS-344, Part 2
L-713	2nd Buff. Tank	RMCA Dwg TS-346, Part 3
L-714	2nd Buff. Tank	RMCA Dwg TS-345, Part 1
L-715	P. A. Tank	RMCA Dwg TS-345, Part 2
L-716	P. A. Tank	RMCA Dwg TS-344, Part 1
L-717	P. A. Tank	RMCA Dwg TS-344, Part 1
L-718	P. A. Tank	RMCA Dwg TS-345, Part 3
	IRON CORE REACTORS	
L-720	P. A. Screen	15 henries, Kenyon T-154
	METERS	
M-701	Filament Voltmeter	0-15 AC Weston 476
M-702	P. A. Cathode Ammeter	0-1 Amp DC Weston #301
M-703	P. A. Grid Milliammeter	0-50 m.a. DC Weston #301
M-704	Plate Voltmeter	0-2 KV 1 m.a., Weston #301
	RESISTORS	
R-701 to R-714 Incl.	Voltage Dividers (14)	1000 Ohms, 5 W, Cont.Carbon D5ST2
R-715 to R-724 Incl.	Voltage Dividers (10)	750 Ohms, 5 W, Cont. Carbon D5ST2
R-725	P.A.Bias (Tuning Only)	500 Ohms, 100 W, IRC Type HA
R-726, 727	P.A. Grid Leak	20,000 Ohms, 5 W, Cont.Carbon D5S

PARTS LIST
MODEL ET-8023-D1
RADIOTELEGRAPH TRANSMITTER

Reference Drawing T-1282

Symbol Desig.	Function	Rating
	RESISTORS (Cont'd)	
R-728	Osc. Cathode	500 Ohms, 5 W. Cont. Carbon D5ST2
R-729	Osc. Grid Leak	50,000 Ohms, 2 W, IRC, BT-2
R-730	1st Buff. Grid Leak	25,000 Ohms, 2 W, IRC, BT-2
R-731	2nd Buff. Grid Leak	SAME AS R-729
R-732	1st Buff. Grid Parasitic	50 Ohms, 2 W, IRC, BT-2
R-733	Osc. Plate Parasitic	15 Ohms, 5 W, IRC, type AA-3-B/PW2003
R-734	Mod. Trans. Primary	75 Ohms, 20 W, IRC, type DG.
R-735	Alternator Field Rheo.) ganged	378 Ohms, 150 W, Ohmite "L") 1986
R-736	Generator Field Rheo.) ganged	585 Ohms, 150 W, Ohmite "L") 1986
R-737	Filament Rheo.	25 Ohms, 150 W, Ohmite "L", 1408
R-738	Voltmeter Multiplier	500,000 Ohms (4 in Series) IRC, Type BT-1
R-739 to R-756 Incl.	Osc. Cathode (18)	SAME AS R-728
R-757	Heater for C-741	25 Ohms, Glass, Clarostat FYG-2
R-731a	2nd Buff. Grid Leak	SAME AS R-729
	SWITCHES	
S-701	1st Buff. Band	Radio Switches, Inc. 1 pole, 9 position, RMCA Type 8023-1
S-702	2nd Buff. Band	Radio Switches, Inc. 2 pole, 9 position, RMCA Type 8023-2
S-703	(Part of S-702)	
S-704	P. A. Band	Radio Switches, Inc. 2 pole, 9 position, RMCA Type 10-C-8
S-705	(Part of S-704)	
S-706	M.O.-Crystal Selector	1 pole, 11 position, Centralab Type BHC-5091.
S-707	Antenna	2 pole, 3 position, Radio Swtiches, Inc. RMCA Type 10-C-9
S-708	A-1 - A-2	SPDT, Bryant Cat. 3983
S-709	Start-Stop	DPST, Bryant Cat. 3982
	POWER TRANSFORMERS	
T-701	Filament	Super Electric type KS-183
T-702	Modulation	Kenyon S-16640, 500 cyc.
	SOCKETS	
X-701	Osc. Tube	Johnson Type 225-5P Ceramic
X-702	1st Buff. Tube	SAME AS X-701
X-703	2nd Buff. Tube	SAME AS X-701
X-704	P. A. Tube	Johnson Type 237-7P Ceramic
X-705	P. A. Tube	SAME AS X-704
X-107	Panel Light	Morse #21, Ediswan Bayonet

PARTS LIST
MODEL ET-8023-D1
RADIOTELEGRAPH TRANSMITTER

Reference Drawings T-1260 and T-1282

Symbol Desig.	Function	Rating
	THE FOLLOWING ITEMS ARE MOUNTED IN THE FRAME BUT ARE EXTERNAL TO ET-8023-D1 TRANSMITTER	
*C-771	M.G. Filter Capacitor	2 mfd., 330 V, G.E. 67X2
*C-772	M.G. Filter Capacitor	SAME AS C-771
*C-773	M.G. Filter Capacitor	SAME AS C-771
*C-774	M.G. Filter Capacitor	SAME AS C-771
*K-771	Motor Starter	G.E. 4052-Y1, Cat. 8027661-G11 with relay heater 81D256
K-772	Telegraph Key	Bunnell J-37 with Bakelite Base
K-773	Ground Contact Spring	RMCA Dwg. TS-222
K-774	Antenna Contact Spring	SAME AS K-773
*L-771	M.G. Filter Choke	3U Delta X-917-4 Spec.
*MG-771	Main Motor Generator	Type ET-8024 Esco Or G.E. - Motor 115 V, 15 A DC, 2500 RPM with coll. rings for 80 V, 2.5 A 83 cyc. - HV Gen. 1400 V, .45 A Alternator 140 V, 2 A, 500 Cyc. 3Unit 2 Ball Bearing Design
*R-771	M.G. Starter Coil Resistor (In K-771)	10,000 Ohms, 2 W, IRC, type BT-2
S-771	M.G. Transfer Switch	10 PDT, RMCA DWG. TS-379 & 380
S-772	Antenna Transfer Switch	RMCA DWG. TS-232, 272, 377 & 378
-----	RM-8 Line Filter	Std. as used with 8506-B Receive
F-101	8506-B Line Fuse (In 8506-B Receiver)	1 amp, 250 V, Glass, 3-AG
F-201	RM-8 Line Fuse	SAME AS F-101
F-202	RM-8 Line Fuse	SAME AS F-101
*F-771	High Voltage Fuse	.75 amp, 3000 V, Cat. 2113
*F-772	Filament Supply Fuse	3 Amp, 250 V, Renew. Cart.
*F-773	500 Cyc. Supply Fuse	SAME AS F-772
F-774	DC Line Fuse (Neg.)	SAME AS F-772
F-775	DC Line Fuse (Pos.)	SAME AS F-772
*F-776	DC Line Fuse (Neg.)	30 amp, 250 V, Renew. Cart.
*F-777	DC Line Fuse (Pos.)	SAME AS F-774

* Additional items used only when the model ET-8023-D1 is installed as an independent unit, except F-774 and F-775 are omitted and replaced by F-776 and F-777.

Items with * are <u>not required</u> when used in conjunction with model 3U.

ET-8023-D1 TRANSMITTER

STANDARD SPARE PARTS

2 - 813 Tubes
3 - 1624 Tubes
1 - Mazda #1141, 21 C.P.
1 - Type 9CE5A51, 2 mfd., Capacitor
2 - 1000 Ohms, type D5ST2 Resistors
2 - 750 Ohms, type D5ST2 Resistors
1 - 500 Ohms, type HA Resistor
1 - 20,000 Ohms, type D5ST2 Resistor
2 - 500 Ohms, type D5ST2 Resistors
1 - 50,000 Ohms, type BT-2 Resistor
1 - 50 Ohms, type BW-2 Resistor
1 - 15 Ohms, type AA Resistor
1 - 75 Ohms, type DG Resistor
1 - 25,000 Ohms, type BT-2 Resistor

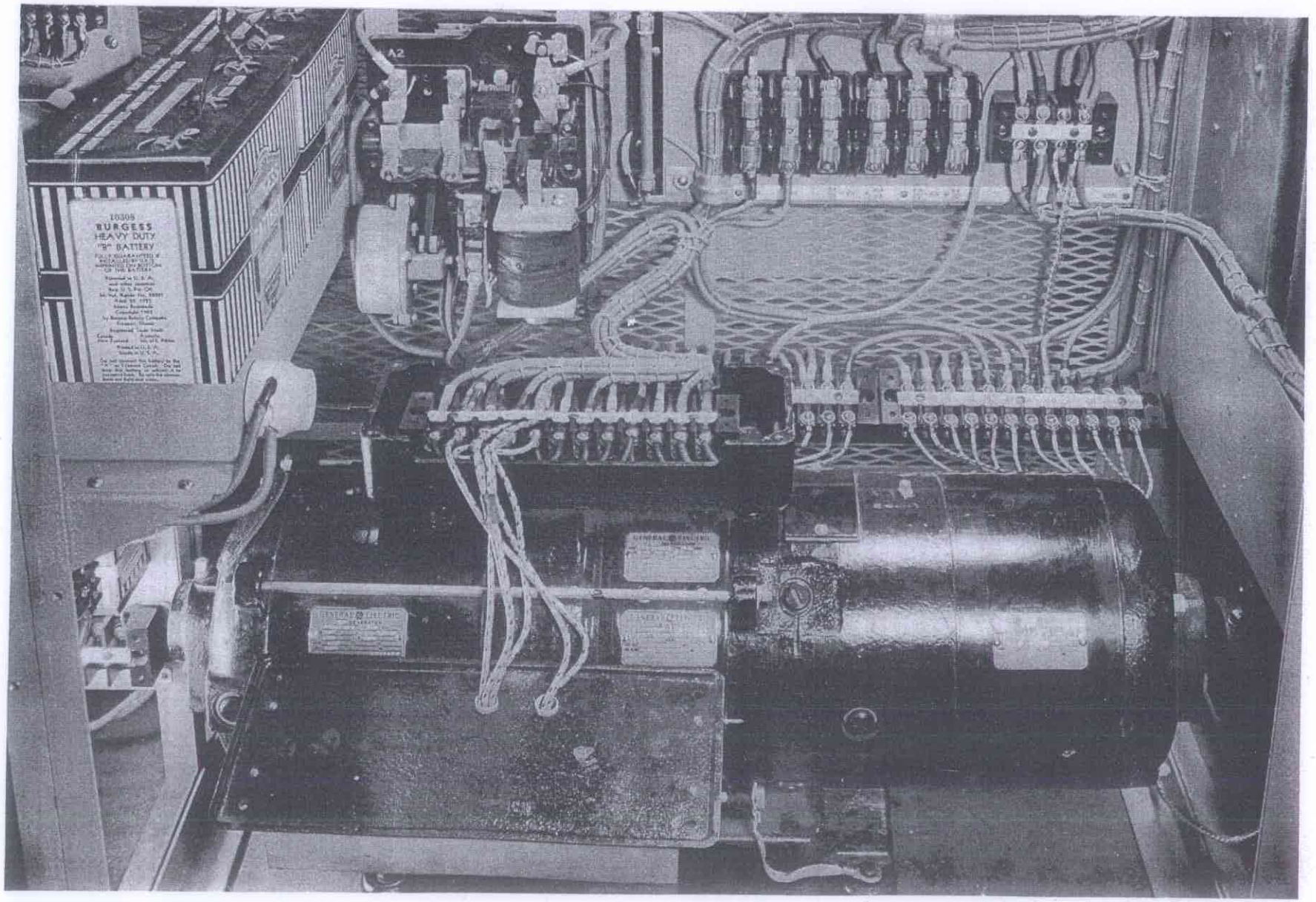
SPARE FUSES

When ET-8023-D1 is Used with Model 3U:

12 - 1 Amp, 250 V, Glass, Type 3-AG
2 - 3 Amp, 250 V, Renewable Cartridge
20 - 3 Amp, 250 V, Fuse Links

When ET-8023-D1 is Used as an Independent Unit:

12 - 1 Amp, 250 V, Glass, Type 3-AG
6 - .75 Amp, 3000 V, Cat. #2113
2 - 3 Amp, 250 V, Renewable Cartridge
20 - 3 Amp, 250 V, Fuse Links
2 - 30 Amp, 250 V, Renewable Cartridge
20 - 30 Amp, 250 V, Fuse Links


10305
BURGESS
HEAVY DUTY
"B" BATTERY
A2

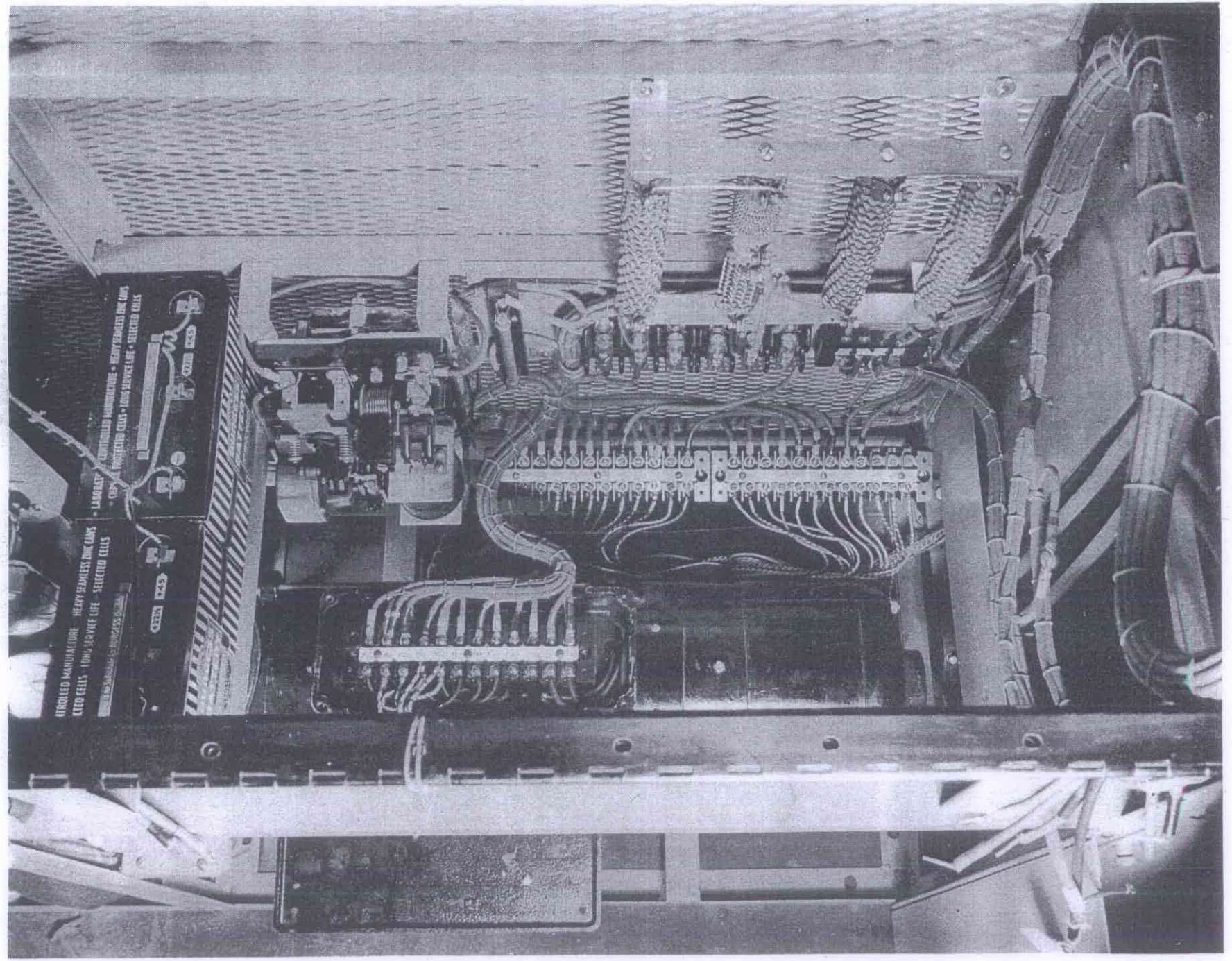


FIGURE 3 - LOWER SECTION, FRAME B, MODEL 3U, AFTER CONVERSION

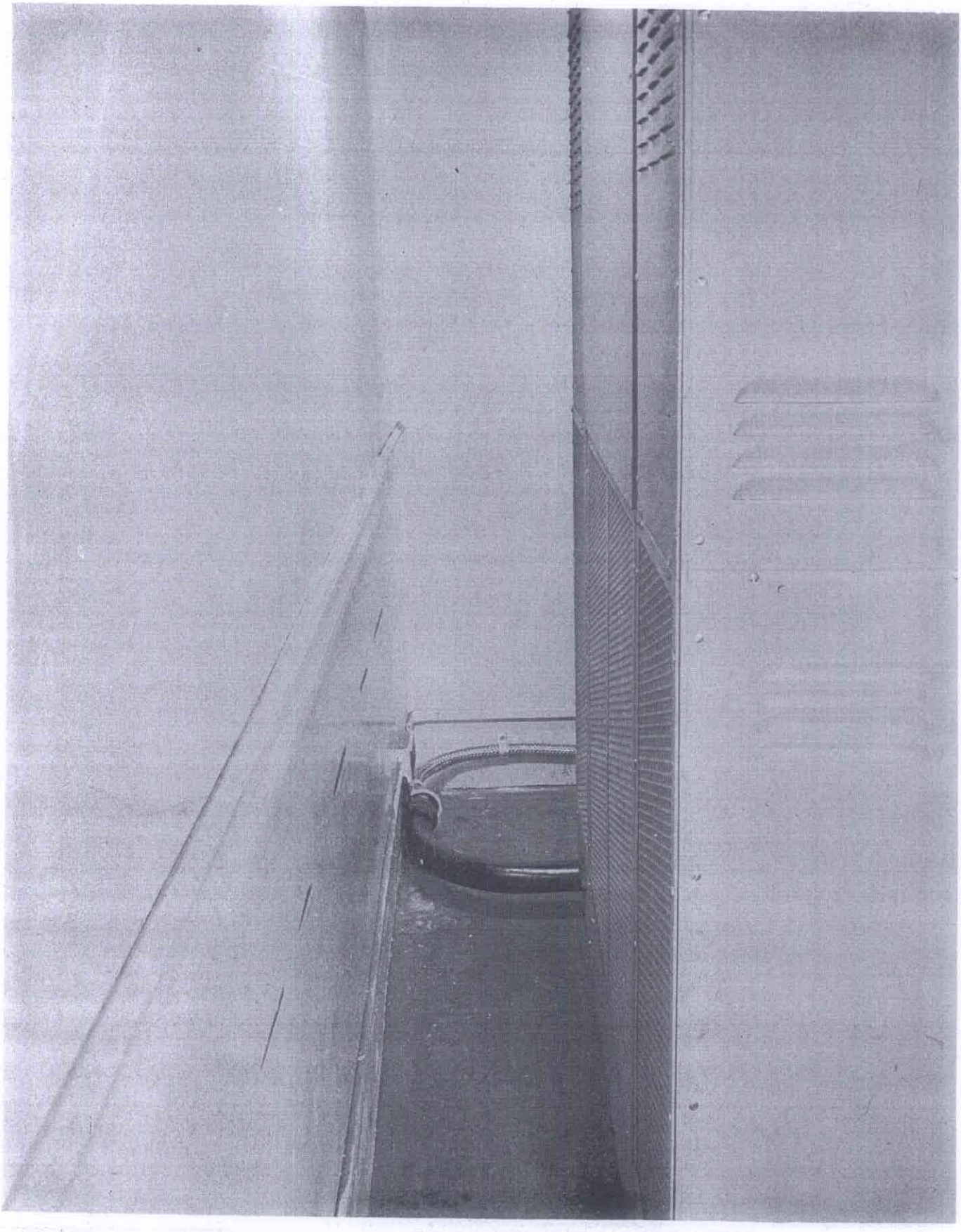


FIGURE 4 - REAR VIEW, MODEL 3U WITH 28 COND. INTERCONNECTING CABLE

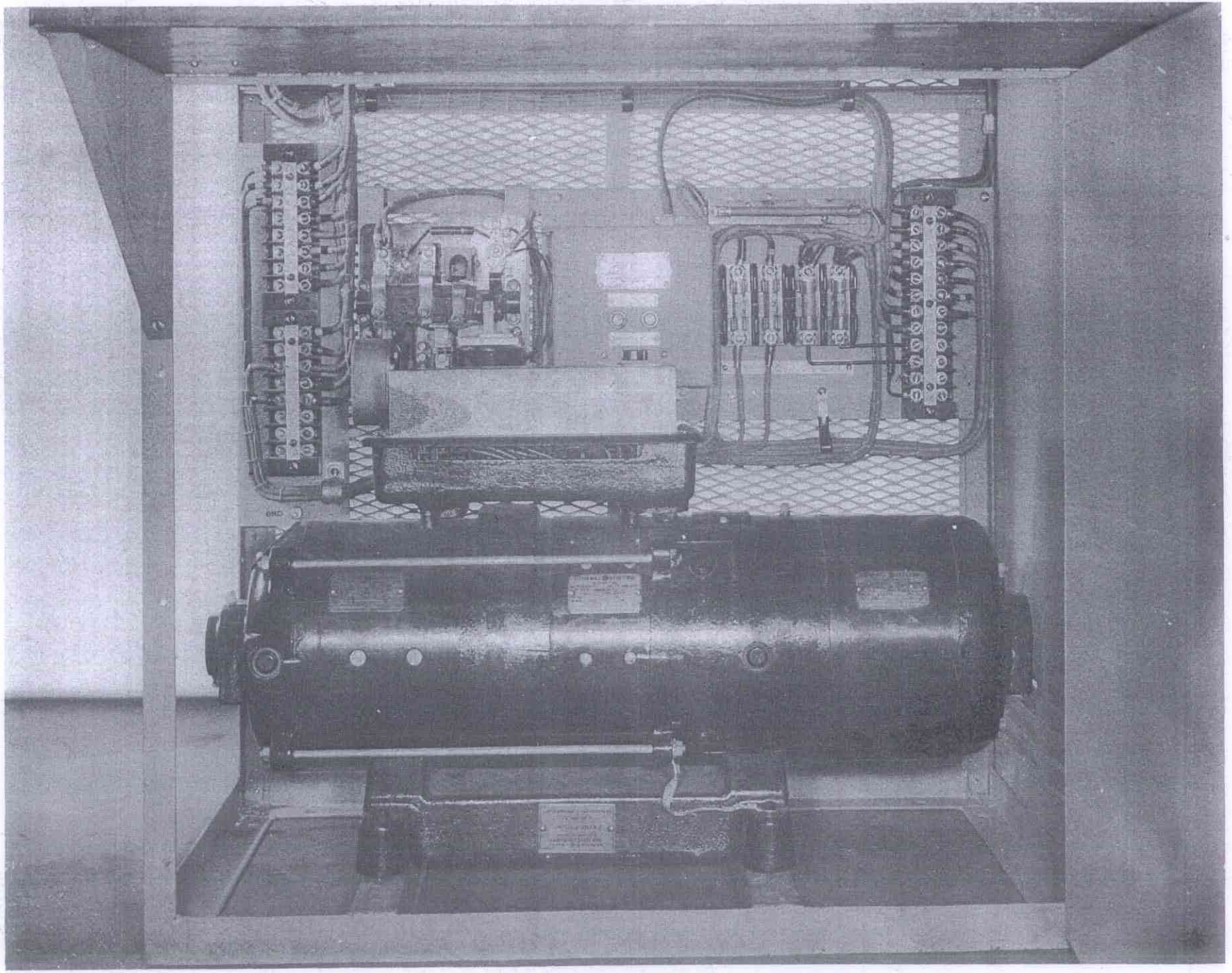


FIGURE 5 - LOWER SECTION ET-8023-D1 AS INDEPENDENT UNIT

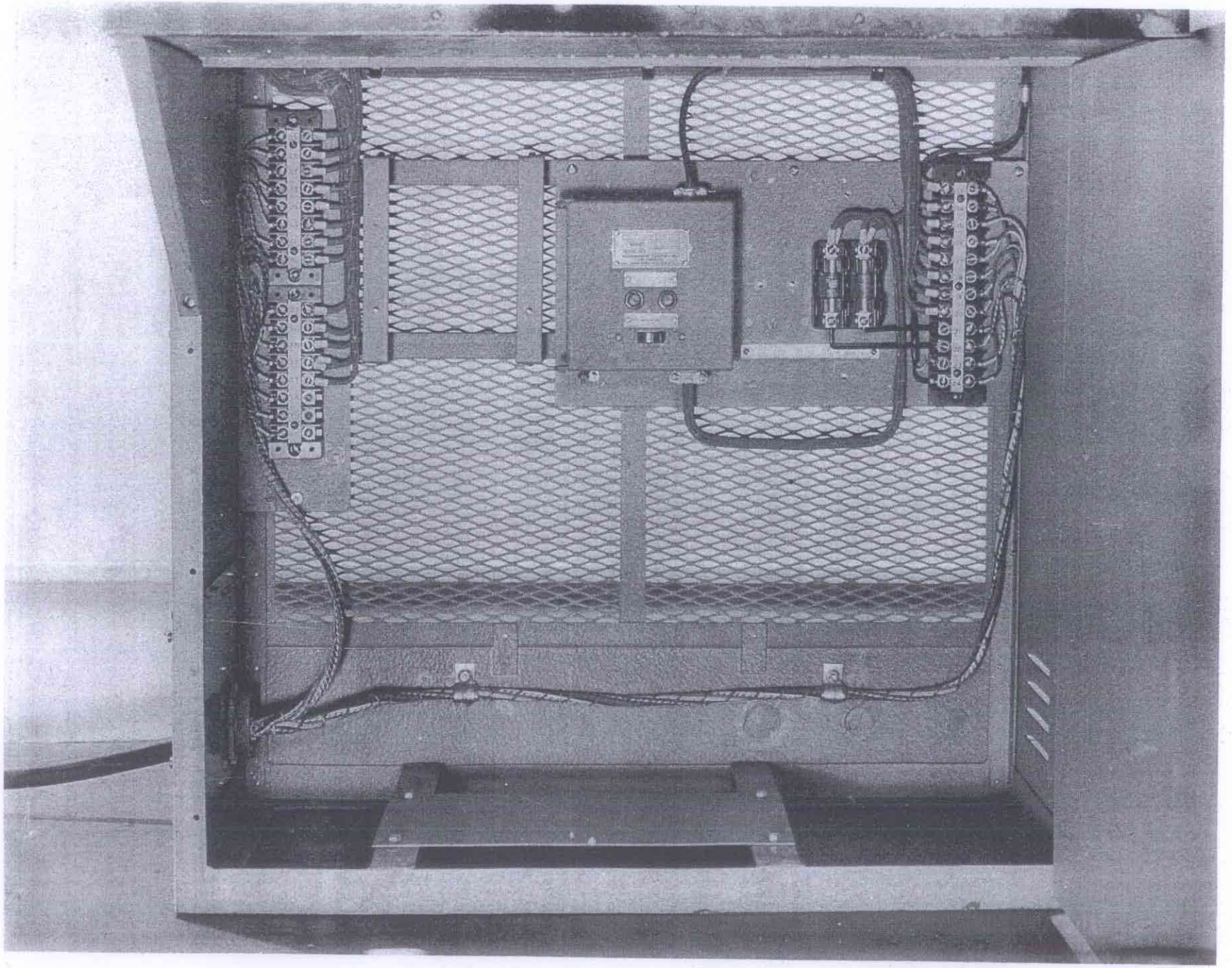
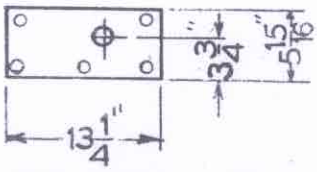
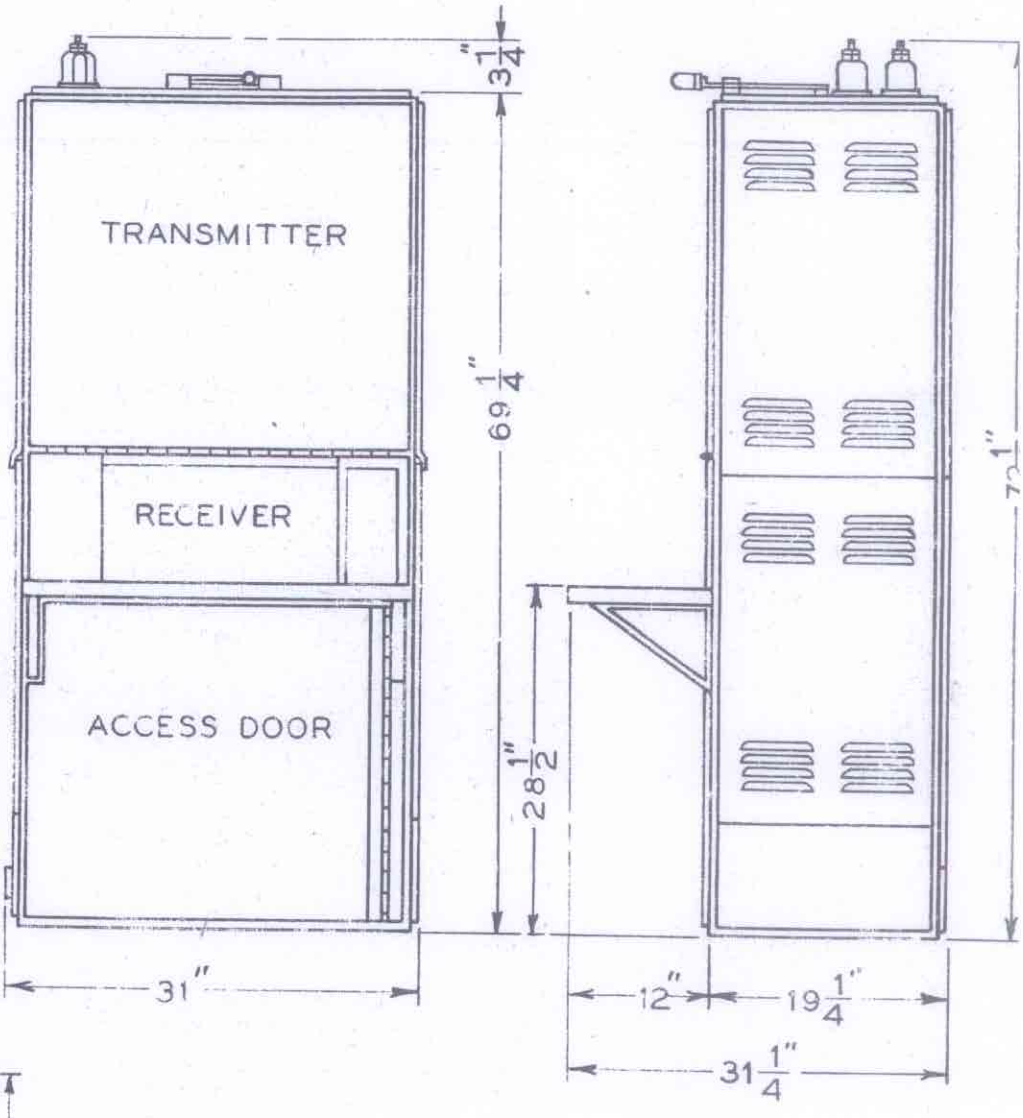
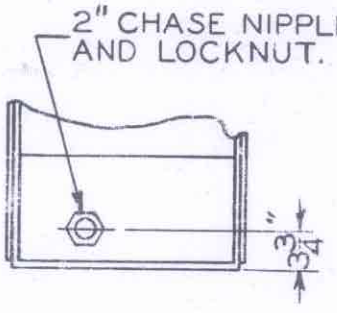


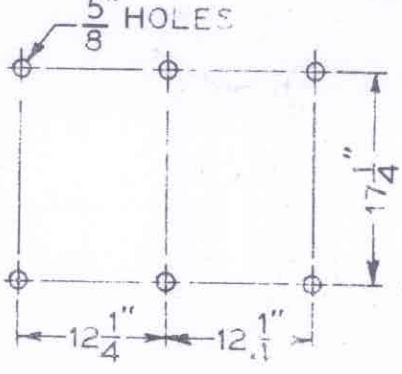
FIGURE 6 - LOWER SECTION ET-8023-D1 WHEN USED WITH MODEL 3H



LOWER REAR PANEL
FOR MODEL 3U
FRAME C





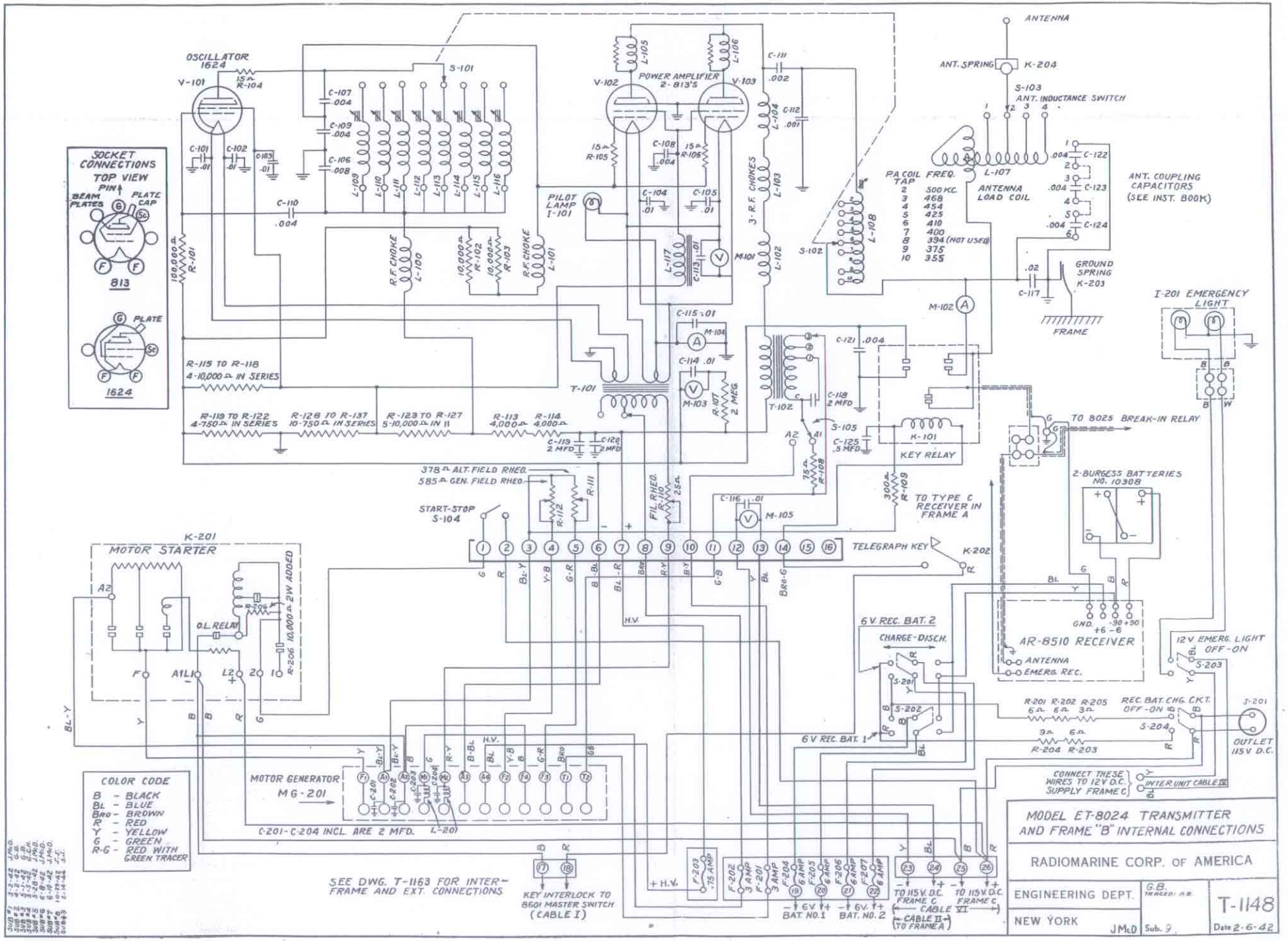


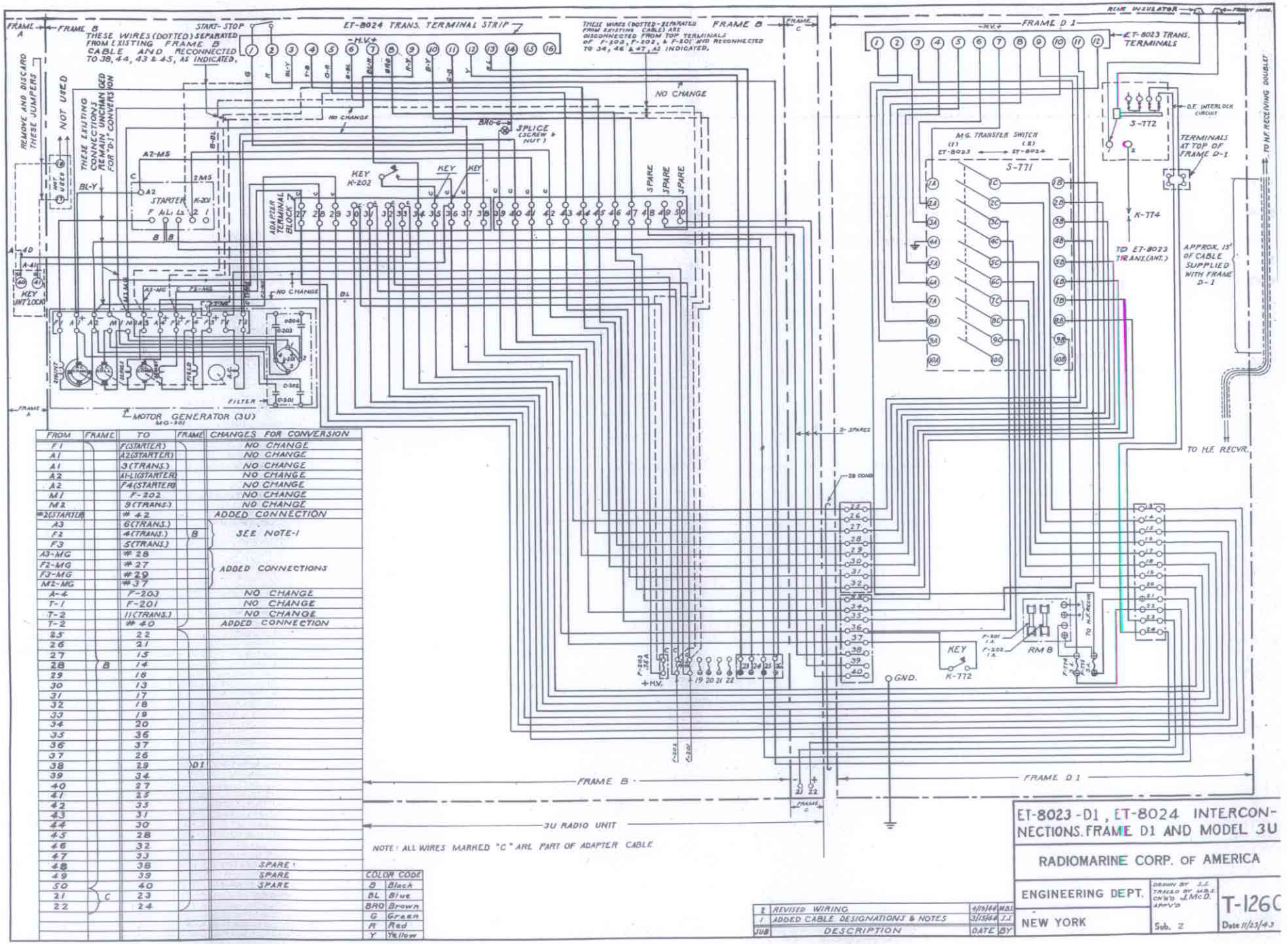
MOUNTING DIMENSIONS

MODEL ET-8023-D1
HIGH FREQUENCY TRANSMITTER
OUTLINE AND MOUNTING DIMENSIONS

RADIOMARINE CORP. OF AMERICA

A.K. 5-1-44 SUB #1	ENGINEERING DEPT.	A.R.	KS-27
	NEW YORK	Sub. ☒1	Date 3-13-4


OSCILLATOR 1624
V-101
S-101
POWER AMPLIFIER 2-813'S
V-102
V-103
ANTENNA
ANT. SPRING
K-204
S-103
ANT. INDUCTANCE SWITCH
L-107
ANTENNA LOAD COIL
ANT. COUPLING CAPACITORS (SEE INST. BOOK)
PA COIL FREQ. TAP
2 500 KC.
3 468
4 454
5 425
6 410
7 400
8 394 (NOT USED)
9 375
10 355
GROUND SPRING K-203
FRAME
SOCKET CONNECTIONS TOP VIEW PIN
BEAM PLATES
PLATE CAP
813
PLATE
1624
PILOT LAMP I-101
M-101
M-102
M-103
M-104
M-105
R.F. CHOKE L-100
R.F. CHOKE L-101
3 R.F. CHOKES L-102 L-103 L-104
T-101
T-102
R-115 TO R-118 4-10,000Ω IN SERIES
R-119 TO R-122 4-750Ω IN SERIES
R-123 TO R-127 5-10,000Ω IN II
R-128 TO R-137 10-750Ω IN SERIES
R-113 4,000Ω
R-114 4,000Ω
C-113 2 MFD
C-126 2 MFD
C-118 2 MFD
C-125 .5 MFD
K-101 KEY RELAY
S-105
I-201 EMERGENCY LIGHT
TO 8025 BREAK-IN RELAY
2-BURGESS BATTERIES NO. 10308
TO TYPE C RECEIVER IN FRAME A
378Ω ALT. FIELD RHEO.
585Ω GEN. FIELD RHEO.
START-STOP S-104
TELEGRAPH KEY
K-202
K-201
MOTOR STARTER
O.L. RELAY
R-206 10,000Ω 2W ADDED
MOTOR GENERATOR MG-201
C-201-C-204 INCL. ARE 2 MFD.
L-201
H.V.
6 V. REC. BAT. 2
CHARGE-DISCH.
6 V REC. BAT. 1
AR-8510 RECEIVER
ANTENNA
EMERG. REC.
GND. +6 -6 -90 +90
12 V EMERG. LIGHT OFF-ON
S-203
R-201 R-202 R-205 6Ω 6Ω 3Ω
REC. BAT. CHG. CKT. OFF-ON
S-204
R-204 3Ω R-203 6Ω
J-201
OUTLET 115 V D.C.
CONNECT THESE WIRES TO 12 V D.C. SUPPLY FRAME C
INTER UNIT CABLE IX
COLOR CODE
B - BLACK
Bl - BLUE
Bro - BROWN
R - RED
Y - YELLOW
G - GREEN
R-G - RED WITH GREEN TRACER
SEE DWG. T-1163 FOR INTER-FRAME AND EXT. CONNECTIONS
KEY INTERLOCK TO 860I MASTER SWITCH (CABLE I)
F-203 .75 AMP
F-202 3 AMP
F-201 3 AMP
F-204 6 AMP
F-205 6 AMP
F-206 6 AMP
F-207 6 AMP
- 6V. + BAT. NO. 1
- 6V. + BAT. NO. 2
TO 115 V.D.C. FRAME C CABLE VI
TO 115 V.D.C. FRAME C CABLE II (TO FRAME A)
MODEL ET-8024 TRANSMITTER AND FRAME "B" INTERNAL CONNECTIONS
RADIOMARINE CORP. OF AMERICA
ENGINEERING DEPT.
NEW YORK
G.B. TRACED: A.B.
JMcD
Sub. 9
T-1148
Date 2-6-42



FROM	FRAME	TO	FRAME	CHANGES FOR CONVERSION
F1		F(STARTER)		NO CHANGE
A1		A2(STARTER)		NO CHANGE
A1		3(TRANS.)		NO CHANGE
A2		A1-L1(STARTER)		NO CHANGE
A2		F4(STARTER)		NO CHANGE
M1		F-202		NO CHANGE
M2		9(TRANS.)		NO CHANGE
#2(STARTER)		# 42		ADDED CONNECTION
A3		6(TRANS.)		
F2		4(TRANS.)	B	SEE NOTE-1
F3		5(TRANS.)		
A3-MG		# 28		
F2-MG		# 27		ADDED CONNECTIONS
F3-MG		# 29		
M2-MG		# 37		
A-4		F-203		NO CHANGE
T-1		F-201		NO CHANGE
T-2		11(TRANS.)		NO CHANGE
T-2		# 40		ADDED CONNECTION
25		22		
26		21		
27		15		
28	B	14		
29		16		
30		13		
31		17		
32		18		
33		19		
34		20		
35		36		
36		37		
37		26		
38		29	D1	
39		34		
40		27		
41		25		
42		33		
43		31		
44		30		
45		28		
46		32		
47		33		
48		38		SPARE
49		39		SPARE
50		40		SPARE
21	C	23		
22		24		

COLOR CODE	
B	Black
BL	Blue
BRO	Brown
G	Green
R	Red
Y	Yellow

NOTE: ALL WIRES MARKED "C" ARE PART OF ADAPTER CABLE

SUB	DESCRIPTION	DATE	BY
2	REVISED WIRING	4/19/44	W.S.
1	ADDED CABLE DESIGNATIONS & NOTES	3/15/44	J.J.

ET-8023-D1, ET-8024 INTERCONNECTIONS. FRAME D1 AND MODEL 3U

RADIOMARINE CORP. OF AMERICA

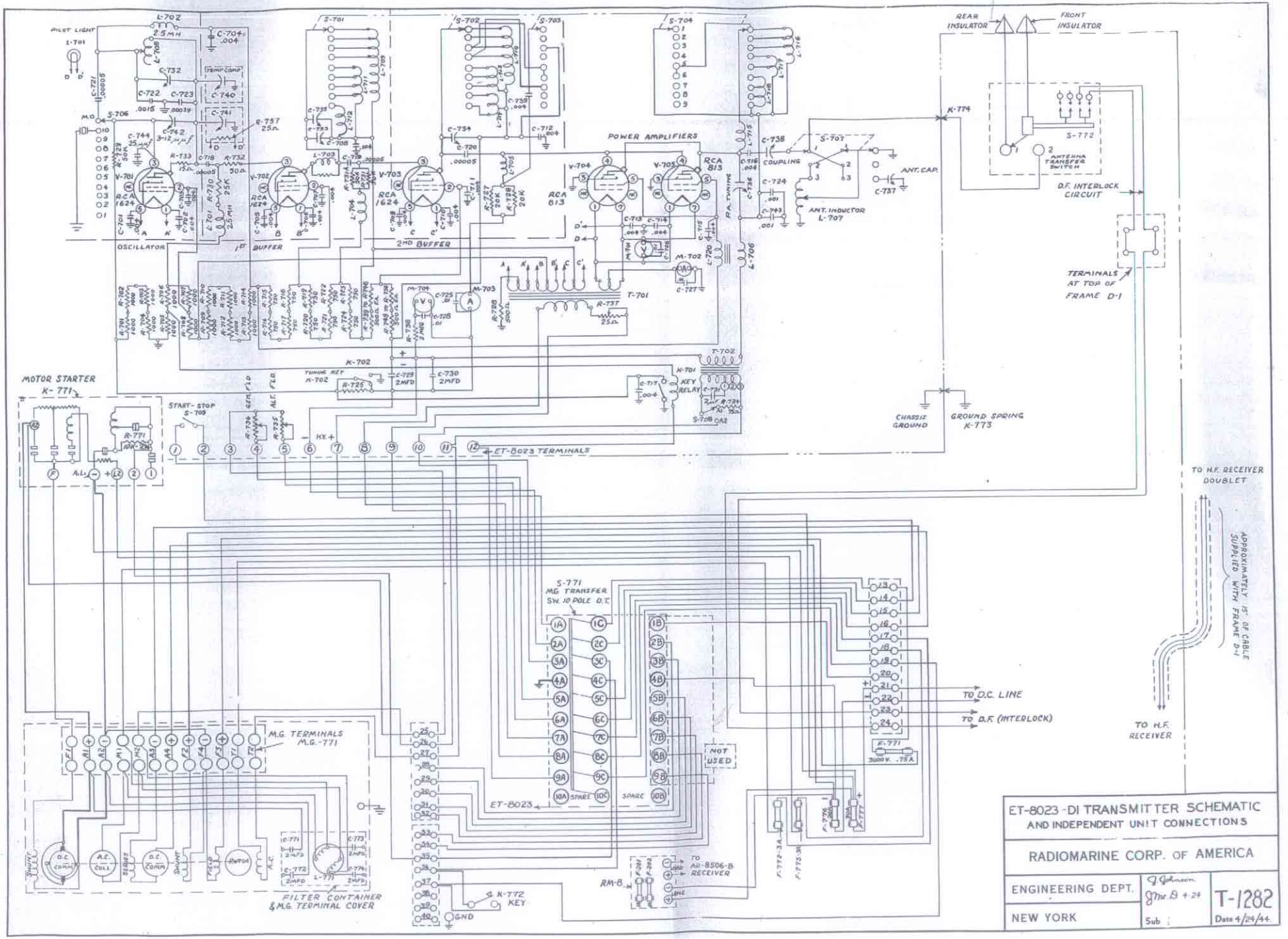
ENGINEERING DEPT. - NEW YORK

DRAWN BY J.J. TRACED BY W.B.J. CH'K'D J.McD. APP'V'D

Sub. 2

T-1260

Date 11/23/43



ET-8023-DI TRANSMITTER SCHEMATIC AND INDEPENDENT UNIT CONNECTIONS

RADIOMARINE CORP. OF AMERICA

ENGINEERING DEPT. — NEW YORK

J. Johnson 5 Mar 8 4-24

Sub :

T-1282

Date 4/24/44

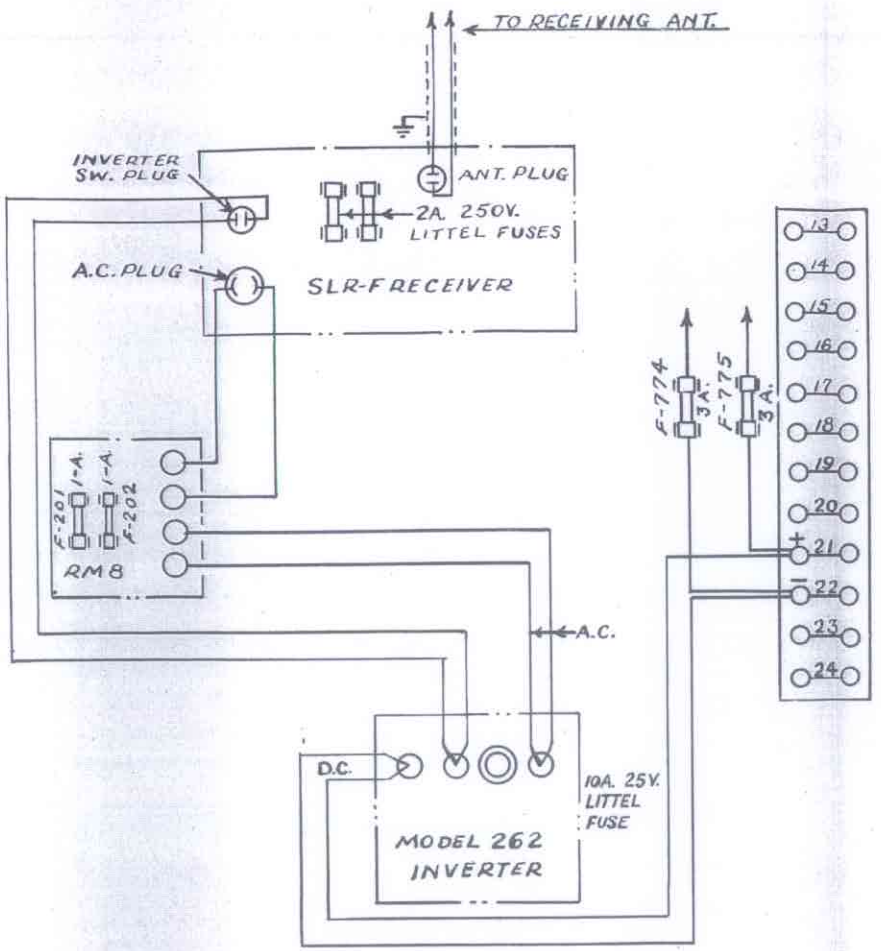


FIG-1
CONNECTIONS FOR SLR-F RECEIVER
WITH MODEL 262 INVERTER

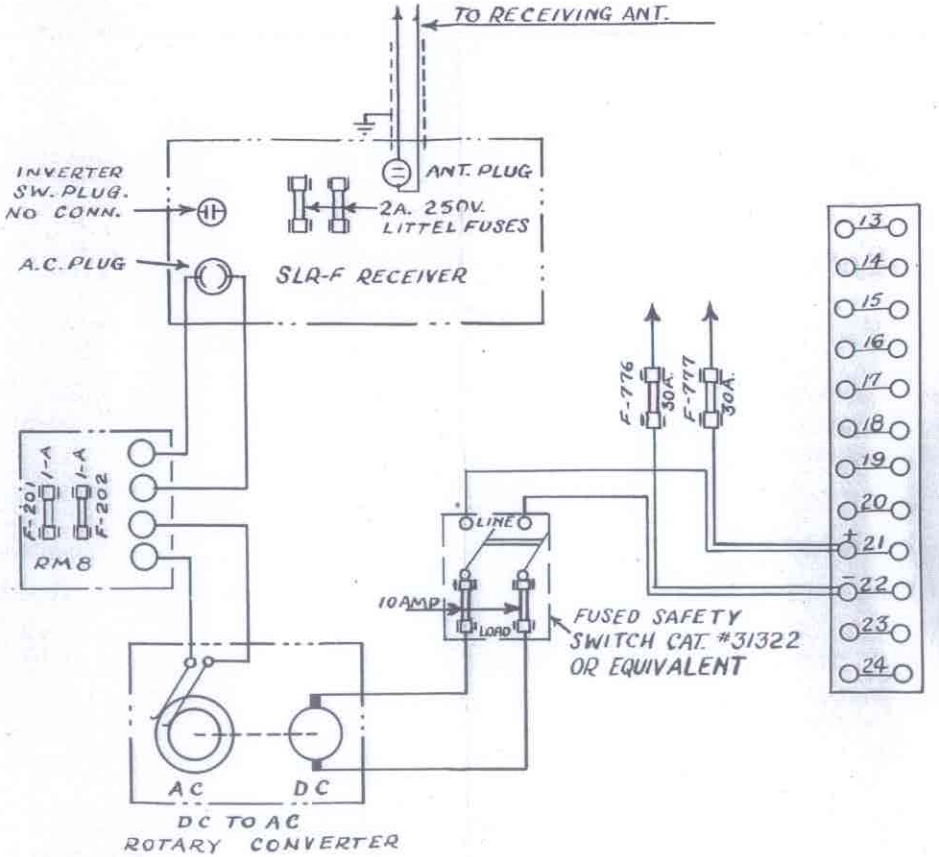


FIG-2
CONNECTIONS FOR SLR-F RECEIVER
WITH ROTARY CONVERTER

Sub. No.	Description	Date	By

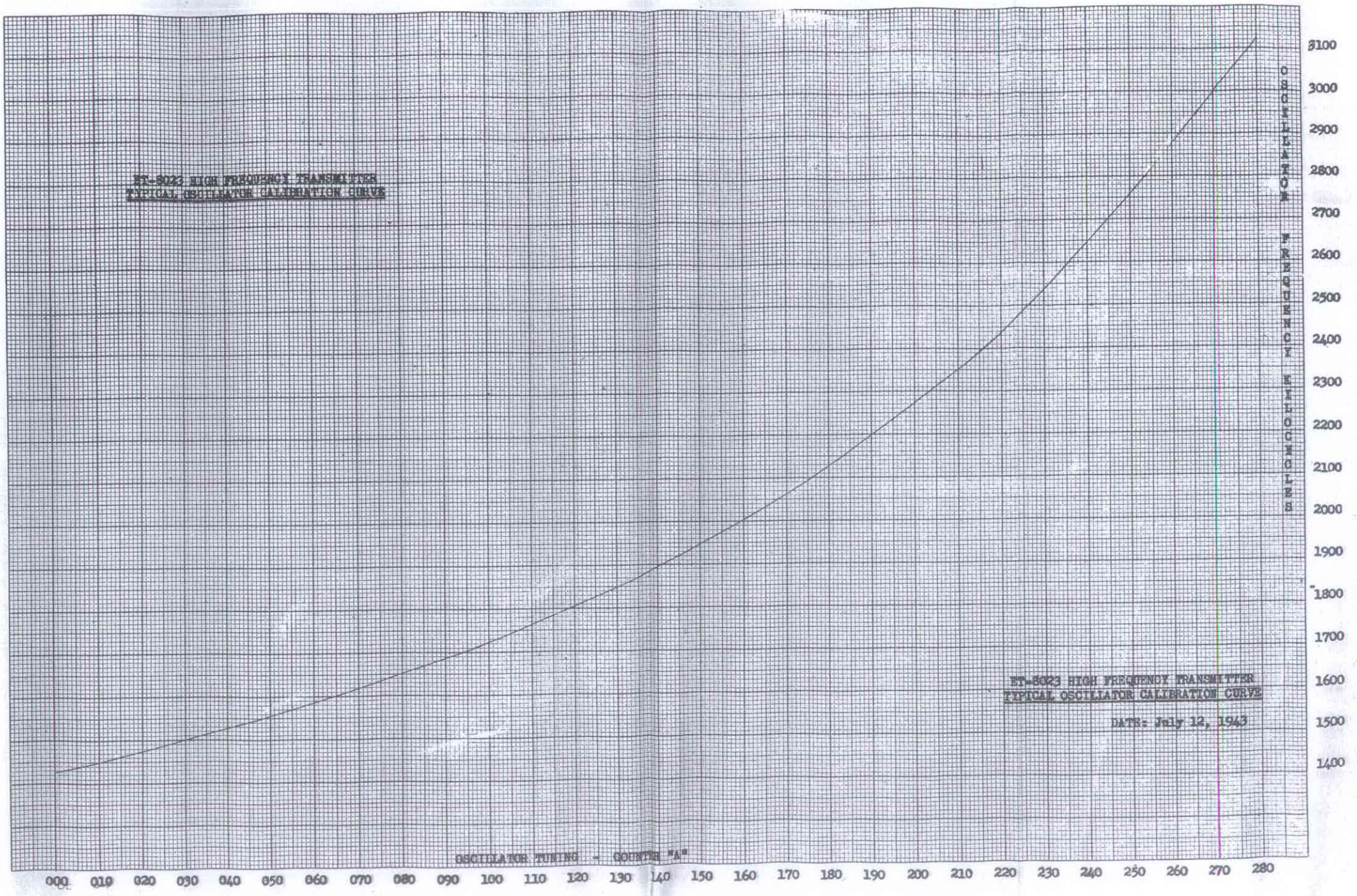
SLR-F RECEIVER IN FRAME D-1

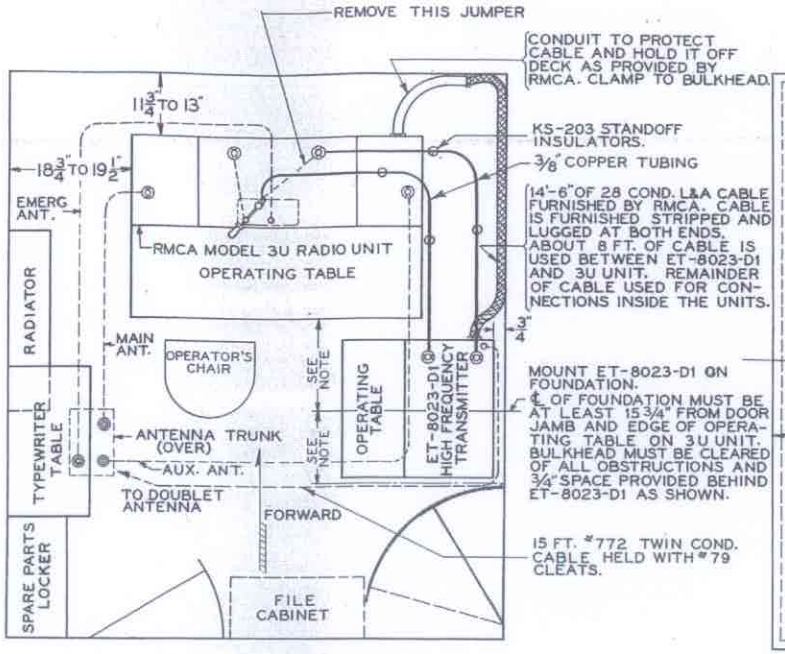
RADIOMARINE CORP. OF AMERICA

ENG. DEPT. NEW YORK, N. Y.

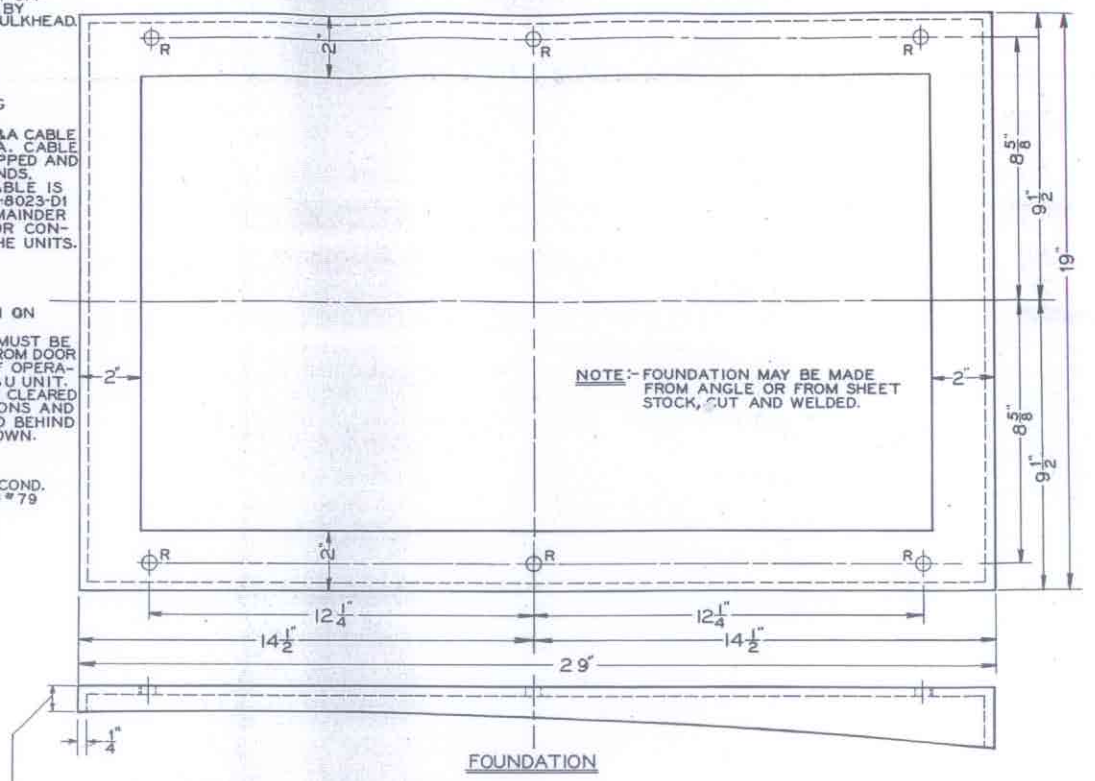
DRAWN BY J.J.
CH'K'D BY JMCD
APP'VD.
Sub ( )

X-103
Date 4/21/44


ET-3023 HIGH FREQUENCY TRANSMITTER
TYPICAL OSCILLATOR CALIBRATION CURVE
OSCILLATOR FREQUENCY KILOCYCLES
3100
3000
2900
2800
2700
2600
2500
2400
2300
2200
2100
2000
1900
1800
1700
1600
1500
1400
OSCILLATOR TUNING - COUNTER "A"
000 010 020 030 040 050 060 070 080 090 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280
ET-3023 HIGH FREQUENCY TRANSMITTER
TYPICAL OSCILLATOR CALIBRATION CURVE
DATE: July 12, 1943



RADIO ROOM LAYOUT



FOUNDATION

CUT TO CORRECT FOR CAMBER AND SHEER OF DECK AND WELD SECURELY TO DECK. DIMENSION AT THIS END TO BE MINIMUM PERMITTING ½" HEX. NUTS AND WASHERS BETWEEN FLANGE AND DECK PLATE AT EACH "R" HOLE. TOP OF FOUNDATION MUST NOT BE BELOW DECK PAVING.

NOTES:
1- FILE TO BE RELOCATED AS SHOWN IF FEASIBLE OTHERWISE TO BE REMOVED FROM RADIO ROOM.
2- TYPEWRITER TABLE TO BE RELOCATED AS SHOWN ABOVE.
3- SCOTT SLR-F OR RMCA AR-8506-B H. F. RECEIVER TO BE INSTALLED IN ET-8023-D1 UNIT.
4- INVERTER FOR SCOTT RECEIVER TO BE MOUNTED IN BASE OF ET-8023-D1 UNIT.
5- SHELF PRESENTLY HOLDING H. F. RECEIVER TO BE REMOVED.
6- FOUNDATION FOR ET-8023-D1 UNIT TO BE INSTALLED BY U.S.M.C. OR W.S.A. ON ALL VESSELS.
7- BOOKSHELF CAN BE LOCATED ABOVE FILE CABINET.

KEY
R 5/8" HOLE

MODEL ET-8023-D1
HIGH FREQUENCY TRANSMITTER
RADIO ROOM LAYOUT — FOUNDATION
FOR EC2-S-C1 VESSELS

RADIOMARINE CORP. OF AMERICA

ENGINEERING DEPT. | A. RICCIO | TS-447
NEW YORK | Subr 872 | Date 1-14-44