LORAN TRANSMITTING EQUIPMENT

Use.—Radio Transmitter for the Loran system of navigation.

Frequency range.—1750 to 1950 kilocycles.

Description.—Loran Transmitter Model T-137, when triggered by an external timer, supplies a high-power pulse of radio-frequency energy which is radiated from an antenna and utilized, by both air and surface craft, to determine a line of position.

Loran Transmitter Model T-137.—The transmitter is completely enclosed in an aluminum cabinet, all panels of which are secured to the frame with screws. Hinged access doors, equipped with electrical interlocks and high-voltage grounding switches, are provided at the front and rear. A meter panel, which extends across the uppermost portion of the front of the transmitter, contains all the principal meters used for ordinary monitoring purposes. Selector switches are located beneath those meters which are used in more than one circuit of the transmitter. Beneath the meter panel, on the left, is the intermediate power-amplifier compartment with two intermediate-power-amplifier stages, suitably shielded from each other. At the rear of the intermediate-power-amplifier compartment, on a vertically mounted chassis, are the two frequency-generator sections of the two excitors. Under this frequency-generator chassis, on the rear wall of the compartment, is a TUNE NORMAL switch. Tuning controls, jacks, and a coiled test lead fitted with a plug are mounted on the facing surface of each frequency-generator chassis. A capacitor-discharge rod is conveniently located within the compartment. On the right-hand side beneath the meter panel is the power-amplifier compartment. A second capacitor-discharge rod is conveniently located within this compartment. Tuning controls for the power-amplifier and output circuits are located beneath the door. Between the intermediate-power-amplifier and the power-amplifier compartments is the monitor oscilloscope, which can be switched to various circuits of the transmitter by panel-mounted controls located directly above the oscilloscope. Between the monitor oscilloscope controls and the meter panel is located a vacuum-tube hour meter. A hinged panel beneath the amplifier compartments mounts the indicators and controls for the transmitter. The power-supply transformers, filter capacitors, a ventilating fan, and a blower are located on the base of the transmitter behind the panels. Two panel controls are provided for adjusting the filament and plate voltages.

Transmission Line Junction Unit.—This component provides for connection of the output line of either of two transmitters to either of two transmission lines leading to the antenna coupling unit. It also provides for the connection of a monitor line between the antenna coupling unit and a transmitter. The housing is fabricated of sheet aluminum, and has two integral mounting brackets. Knockouts are provided for the entrance of cables. Internal access is obtained by removing the eight thumb screws which secure the front panel. The front panel is equipped with two electrical interlocks.

Antenna Coupling Unit.—This component matches the transmitting antenna to the transmission line. In addition, it provides a dummy load for tuning and testing purposes, and a capacitive pickup for a monitor line returning to the transmitter. The housing comprises a weatherproofed, aluminum box, together with four aluminum legs which support it above the ground. Hinged front doors provide access to the tuning dials, meters, and switches necessary for operating the antenna coupling unit. The meters can be viewed through door windows. Provision is made for electrical connections through conduit holes in the bottom. Ventilation is achieved by means of louveres. Antenna connection is made at the side of the housing. Illumination inside the coupling unit is controlled by a switch on the left side of the housing, behind the door. A 115-volt power outlet is located just below the light switch.

Phase-Shifting Unit.—This component controls the phase of the 100-kilocycle signal input to the transmitter. It is contained in an aluminum housing with studs for mounting on the side of the Synchronization Control Unit of the Model UE-1 or UE-1b Loran Timer. Calibrated controls are mounted on the front panel, for manual adjustment of the phase of the 100-kilocycle signal. Removal of two thumb screws that secure the rear panel provides internal access. This component is not used or required in a standard T-137 installation.

TECHNICAL FEATURES

<table>
<thead>
<tr>
<th>Tube Complement</th>
<th>Type</th>
<th>Quantity</th>
<th>Type</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>JAN 2X2A</td>
<td>4</td>
<td>JAN 6S7.</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>JAN 4C35</td>
<td>2</td>
<td>JAN 6SN7GT</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>JAN 2FP1A</td>
<td>1</td>
<td>JAN 6SN7W</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>JAN 5R4G</td>
<td>1</td>
<td>JAN 6V6G7/G</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>JAN 5U4G</td>
<td>1</td>
<td>JAN 7C23.</td>
<td>4</td>
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</tr>
<tr>
<td>JAN 6AC7</td>
<td>1</td>
<td>JAN 715C.</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>JAN 6AG7</td>
<td>1</td>
<td>JAN 807.</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>JAN 6H6GT</td>
<td>2</td>
<td>JAN 8200</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>JAN 6J5</td>
<td>8</td>
<td>JAN 8200</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>JAN 6SA7</td>
<td>4</td>
<td>Total number of tubes: 57</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Design.—Coast Guard.

Contractor.—Federal Telephone and Radio Corporation.

Frequency control.—Crystal.

Type of emission.—Pulse.

Basic pulse rates.—20, 25, and 33⅓ pulses per second, single- or double-pulsed.

Pulse width.—40 microseconds at half amplitude.

Power output.—160 kilowatts, single-pulsed; 128 kilowatts, double-pulsed.

Power factor.—90 percent.

Power supply required.—230 volts, 50/60 cycles per second, single phase, 23 amps.

Heat dissipation.—4.5 kilowatts.

Spare parts.—Set of equipment spares packed in separate spare-parts boxes.
Loran Transmitter Model T-137
## Weights and Dimensions of Equipment Supplied

<table>
<thead>
<tr>
<th>Quantity per normal station</th>
<th>Component</th>
<th>Height (inches)</th>
<th>Width (inches)</th>
<th>Depth (inches)</th>
<th>Weight (pounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Loran Transmitter Model T-137.</td>
<td>84$\frac{1}{4}$</td>
<td>72$\frac{1}{4}$</td>
<td>37$\frac{1}{2}$</td>
<td>2,971</td>
</tr>
<tr>
<td>1 for each timer</td>
<td>Phase Shifting Unit</td>
<td>5$\frac{1}{4}$</td>
<td>4$\frac{1}{2}$</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>1</td>
<td>Antenna Coupling Unit</td>
<td>169</td>
<td>79</td>
<td>69$\frac{1}{2}$</td>
<td>1,348</td>
</tr>
<tr>
<td>2</td>
<td>Mounting Base (p/o Antenna Coupling Unit)</td>
<td>27$\frac{1}{2}$</td>
<td>31$\frac{1}{2}$</td>
<td>57$\frac{1}{2}$</td>
<td>84</td>
</tr>
<tr>
<td>4</td>
<td>Legs (p/o Antenna Coupling Unit)</td>
<td>96</td>
<td>2</td>
<td>2</td>
<td>38</td>
</tr>
<tr>
<td>2</td>
<td>50-ft coil, Standard RG-19/U Cable</td>
<td>12</td>
<td>42</td>
<td>40</td>
<td>72</td>
</tr>
<tr>
<td>1</td>
<td>Transmission Line Junction Unit</td>
<td>16$\frac{1}{4}$</td>
<td>20</td>
<td>11</td>
<td>45</td>
</tr>
<tr>
<td>2</td>
<td>500-ft reel, Type RG-147/U Cable</td>
<td>54</td>
<td>54</td>
<td>39</td>
<td>1,811</td>
</tr>
<tr>
<td>1 Set.</td>
<td>Instruction Books</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Equipment Spare Parts</td>
<td></td>
<td></td>
<td></td>
<td>See shipping weights and dimensions.</td>
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</table>

1 Including mounting base and legs.

### Shipping Weights and Dimensions

<table>
<thead>
<tr>
<th>Component</th>
<th>Size (inches)</th>
<th>Gross weight (pounds)</th>
<th>Volume (cubic feet)</th>
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</thead>
<tbody>
<tr>
<td>Loran Transmitter Model T-137</td>
<td>100 x 93 x 53</td>
<td>4,129</td>
<td>284</td>
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<tr>
<td>Four Phase Shifting Units</td>
<td>18 x 24 x 19</td>
<td>67</td>
<td>5</td>
</tr>
<tr>
<td>Antenna Coupling Unit 1</td>
<td>103 x 90 x 72</td>
<td>2,314</td>
<td>386</td>
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<tr>
<td>Mounting Base (p/o Antenna Coupling Unit)</td>
<td>31 x 61 x 61</td>
<td>276</td>
<td>67</td>
</tr>
<tr>
<td>Legs (p/o Antenna Coupling Unit)</td>
<td>111 x 7 x 6</td>
<td>79</td>
<td>3</td>
</tr>
<tr>
<td>Two 50-ft coils, Standard RG-19/U Cable</td>
<td>12 x 42 x 40</td>
<td>155</td>
<td>12</td>
</tr>
<tr>
<td>Transmission Line Junction Unit</td>
<td>22 x 31 x 26</td>
<td>100</td>
<td>11</td>
</tr>
<tr>
<td>500-ft reel, Type RG-147/U Cable</td>
<td>57 x 57 x 39</td>
<td>2,315</td>
<td>73</td>
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<tr>
<td>Tubes, one complete set</td>
<td>26 x 37 x 30</td>
<td>161</td>
<td>17</td>
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<tr>
<td>Equipment Spare Parts:</td>
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<tr>
<td>Shipping Box No.:</td>
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<tr>
<td>13.</td>
<td>15 x 27 x 18</td>
<td>78</td>
<td>5</td>
</tr>
<tr>
<td>14.</td>
<td>15 x 27 x 18</td>
<td>70</td>
<td>5</td>
</tr>
<tr>
<td>15.</td>
<td>23 x 31 x 25</td>
<td>100</td>
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<td>16.</td>
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<tr>
<td>17.</td>
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<td>96</td>
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</tr>
<tr>
<td>18.</td>
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<td>75</td>
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<td>19.</td>
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<td>24.</td>
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<tr>
<td>25.</td>
<td>15 x 27 x 18</td>
<td>81</td>
<td>5</td>
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<tr>
<td>26.</td>
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<td>94</td>
<td>5</td>
</tr>
<tr>
<td>27.</td>
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<td>54</td>
<td>5</td>
</tr>
<tr>
<td>28.</td>
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<td>114</td>
<td>5</td>
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<td>29.</td>
<td>19 x 24 x 21</td>
<td>91</td>
<td>6</td>
</tr>
<tr>
<td>30.</td>
<td>15 x 27 x 18</td>
<td>94</td>
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<td>12 x 17 x 13</td>
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<td>2</td>
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<td>276</td>
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<td>33.</td>
<td>19 x 24 x 21</td>
<td>88</td>
<td>6</td>
</tr>
<tr>
<td>34.</td>
<td>19 x 24 x 21</td>
<td>86</td>
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<td>35.</td>
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<td>94</td>
<td>5</td>
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<td>36.</td>
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<td>90</td>
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</tr>
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<td>5</td>
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<tr>
<td>38.</td>
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<td>73</td>
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</tr>
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<td>39.</td>
<td>15 x 27 x 18</td>
<td>70</td>
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</tr>
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<td>40.</td>
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<td>60</td>
<td>5</td>
</tr>
<tr>
<td>41.</td>
<td>15 x 27 x 18</td>
<td>75</td>
<td>5</td>
</tr>
<tr>
<td>42.</td>
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<td>5</td>
</tr>
<tr>
<td>43.</td>
<td>21 x 24 x 19</td>
<td>58</td>
<td>6</td>
</tr>
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<td>44.</td>
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<td>5</td>
</tr>
<tr>
<td>45.</td>
<td>21 x 24 x 21</td>
<td>93</td>
<td>7</td>
</tr>
<tr>
<td>46.</td>
<td>13 x 23 x 18</td>
<td>48</td>
<td>4</td>
</tr>
<tr>
<td>47.</td>
<td>15 x 27 x 18</td>
<td>52</td>
<td>5</td>
</tr>
<tr>
<td>48.</td>
<td>23 x 31 x 25</td>
<td>112</td>
<td>11</td>
</tr>
<tr>
<td>49.</td>
<td>23 x 31 x 25</td>
<td>104</td>
<td>11</td>
</tr>
<tr>
<td>50.</td>
<td>23 x 31 x 25</td>
<td>113</td>
<td>11</td>
</tr>
<tr>
<td>51.</td>
<td>15 x 23 x 18</td>
<td>45</td>
<td>4</td>
</tr>
<tr>
<td>52.</td>
<td>15 x 27 x 18</td>
<td>49</td>
<td>5</td>
</tr>
<tr>
<td>53.</td>
<td>16 x 22 x 22</td>
<td>29</td>
<td>3</td>
</tr>
</tbody>
</table>

1 Less mounting base and legs.
## Equipment Required But Not Supplied

<table>
<thead>
<tr>
<th>Qty</th>
<th>Name</th>
<th>Model or type</th>
<th>Required use</th>
<th>Required characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Timer</td>
<td>Model UE-1 or Model UE-1b</td>
<td>To develop accurately timed trigger pulses for the transmitter.</td>
<td>100-ke and output pulse signals (double-pulsed).</td>
</tr>
<tr>
<td>2</td>
<td>Timer</td>
<td>Model UE-1 or Model UE-1b</td>
<td></td>
<td>Single-pulsed.</td>
</tr>
<tr>
<td>1</td>
<td>Switching equipment</td>
<td>Model UM, modified for use with Loran Transmitter Model T-137.</td>
<td>Input switching</td>
<td>Selective connection of any timer to any transmitter exciter. Length as required for installation.</td>
</tr>
<tr>
<td></td>
<td>Cable</td>
<td>RG-8/U</td>
<td>Component interconnection.</td>
<td>Length as required for installation.</td>
</tr>
<tr>
<td></td>
<td>Cable</td>
<td>RG-148/U</td>
<td>Component interconnection.</td>
<td></td>
</tr>
</tbody>
</table>

1 Four required for double-pulsed operation: 2 operating, 2 spares.
2 Two required for single-pulsed operation: 1 operating, 1 spare.