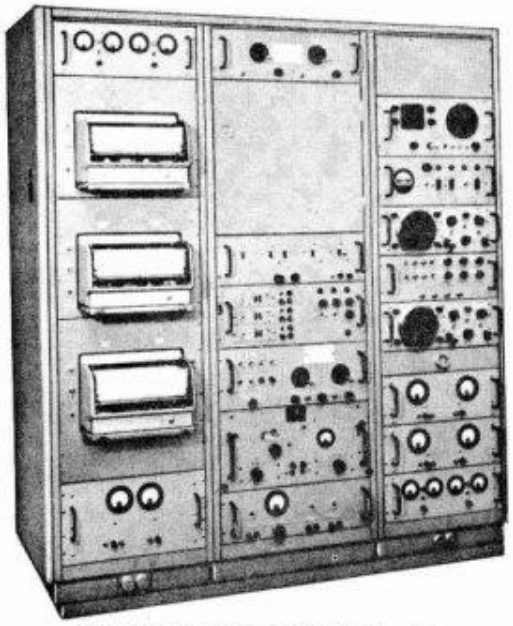
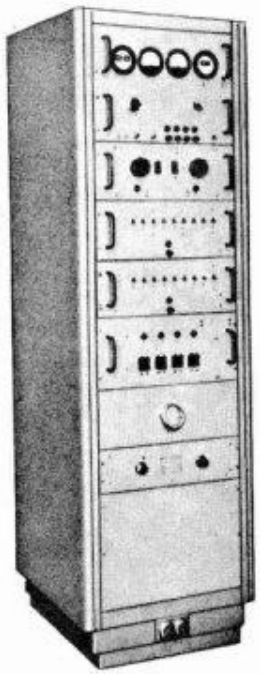
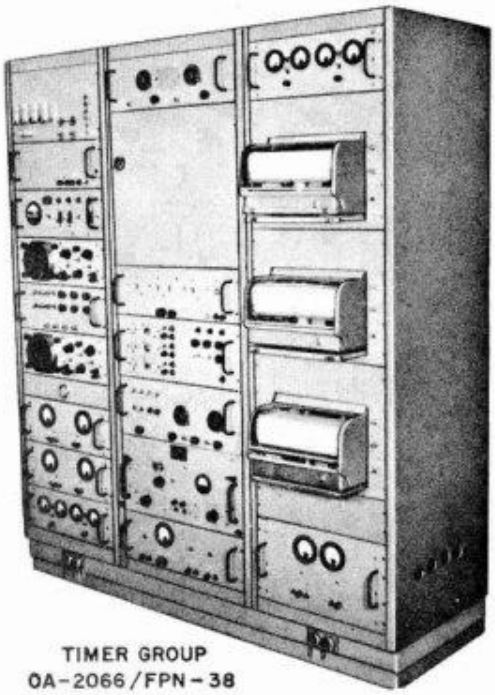


TIMER GROUP OA-2067/FPN-38



SWITCHING GROUP POWER
OA-2068/FPN-38

TRANSFORMER POWER
ISOLATION TF-191/FPN-38



TIMER GROUP
OA-2066/FPN-38

Loran-C Timer Synchronizer SET AN/FPN-38

DESCRIPTION OF COAST GUARD ELECTRONIC EQUIPMENT

FUNCTIONAL DESCRIPTION:

The Loran-C Timer Synchronizer AN/FPN-38 provides the accurately timed triggers at 500- or 1000-microsecond spacing and 100-kc stable frequency reference which control the generation of the transmitter pulses. The Timer at the Master station establishes the basic repetition rate for the station group operation. The Timer also provides the monitoring and recording facilities for station operation. Timer Synchronizer AN/FPN-38 operates in conjunction with Transmitter AN/FPN-39 at a permanently installed land-based station which is located at an accurately known geographical location.

EQUIPMENT REQUIRED BUT NOT SUPPLIED:

Loran-C Transmitter AN/FPN-38 is required to amplify, shape, and transmit pulses formed from the 100-kc reference voltage and multipulse triggers generated by Timer Synchronizer AN/FPN-39.

ELECTRICAL AND MECHANICAL CHARACTERISTICS:

The Timer Synchronizer comprises three major basic units; Timer Group 1, Timer Group 2, and the Signal Entrance Unit. With the exception of two chassis, Timer Groups 1 and 2 are identical. Each Timer is composed of three 6-foot 2-inch racks mounted side by side identified as Recorder Unit, Receiver Unit, and Monitor Unit. The two timers are positioned so that the two Monitor Units are at the center and the two Recorder Units at the ends of the assembly. Overall dimensions of Timer Groups 1 and 2 are 80 inches high, 138 inches wide, and 22 inches deep. The Signal Entrance Unit, which is 80 inches high and 22 inches square, is located to the right of Timer Group 2.

The Recorder Units each contain two power supplies and three dual recorders. The ±12 volt power supply at the top of the rack furnishes all the positive and negative 12 volts required. The +150 volt regulated power supply at the bottom of the unit provides the 600 milliampere, regulated +150-volt power used throughout the timer. Three dual-channel recorders, used for recording the system time-difference readings, are located in the center portion of the rack.

The Receiver Unit contains, in top to bottom order, the RF Amplifier and Notch Filter, Synchronizer, Transmitter Adapter, Control Indicator, Filter, 100-Kc Oscillator, and Receiver Power Supply. The RF Amplifier and Notch Filter, which is slide mounted, amplifies the received signals and rejects any unwanted cw interference. The Synchronizer, which is mounted on a vertical hinge, contains the sampling and filtering circuits which provide the error signals, the divider chain, the gating networks and amplifiers, and the servo amplifiers which drive the phase-shifting motors and time-difference dials.

The Transmitter Adapter, also slide mounted, contains M Cycle, M Env. and Cycle Comp. phase shifters and associated motors, the envelope timing phase shifter, sampling trigger gate circuitry, and ninth pulse and blinker circuits. The Control Indicator contains the X, Y, and Z slave mechanical units which give a continuous indication of slave time-difference readings, the repetition rate selector switches, and the operating indicators.

The slide mounted Filter chassis filters the RF Amplifier output by notch rejection and narrow-band filters to provide a better presentation on the monitor oscilloscope. The 100-Kc Oscillator chassis, containing the precisely calibrated crystal, crystal oven, and frequency control circuits is mounted on slides directly below the Filter chassis. At the bottom of the rack, also on slides, is the Receiver Power Supply which furnishes special regulated voltages for the Timer.

The Monitor Unit contains in top to bottom order, the Phase Aligner, a power panel, an oscilloscope, oscilloscope control panel, a second oscilloscope, a pull-out desk, and three regulated power supplies. The oscilloscopes are used for viewing waveforms, selected by controls on the oscilloscope control panel. The +135V, −150V, and +28V regulated power supplies furnish power for the timer circuits. The Phase Aligner located in Timer 1 is used by both timers as a phase standard for calibration purposes. Timer 2 contains the Test Pulse Generator in place of the Phase Aligner. This unit generates pulses similar to those normally received which are used for test purposes.

The Signal Entrance Unit contains, in top-to-bottom order, the Meter Panel, Pulse Analyzer, Power Control Panel, two Switched Attenuators, Power Distribution Panel, a utility drawer, WWV Signal Mixing Panel, and a voltage regulator. The Meter, Power Control, and Power Distribution panels monitor and control the application and distribution of primary power and facilitate timer switching. The Switched Attenuators vary the amplitude of the transmitted signals fed to the RF Amplifiers. The WWV signal Mixing Panel is used to check the oscillator against the signals from Radio Stations WWV and WWVH. The pulse analyzer contains switches and circuits for selecting individual transmitted pulses for examination on the oscilloscopes. Only the Switched Attenuators are slide mounted.

MANUFACTURER'S OR CONTRACTOR'S DATA:

Loran-C Timer Synchronizer AN/FPN-38 is manufactured by Sperry Gyroscope Company Division of Sperry Rand Corporation, Great Neck, New York, under U.S. Coast Guard Contract Tcg-40661.

REFERENCE DATA AND LITERATURE:

Technical Manual for Loran-C Timer Synchronizer AN/FPN-38: CG-273-59

Technical Manual for Loran-C Transmitter AN/FPN-39: CG-273-58

TUBE COMPLEMENT:

Type	Quantity	Type	Quantity	Type	Quantity	Type	Quantity
5642	8	5U4GB	12	5840	2	6DJ8	4
5651	4	5Y4GA	1	6021	16	6L6GB	1
5670	11	5Y3	5	6080	1	6U8	12
5687	6	6AH6	1	6111A	20	6V6Y	1
5725/6AS6W	11	6AN8	4	6112A	12	6X4	4
5727/2D21W	2	6AQ5	6	6550	20	12AT7WA	6
5744WA	4	6AU6	7	OA2	1	12AU7	20
5749	4	6AW8A	6	1B3GT	1	12AX7	6
5755	10	6BK7B	1	2AS15A	1	12AZ7	8
5841A	35	6B17GT	2	3WP-1A	1	12B4	8
5829WA	14	6C4	2	5AQP-	4	12BH7A	1
						85A2/OG3	6

EQUIPMENT SUPPLIED:

Quantity per Station	Nomenclature		Dimensions in Inches		
	Name and Designation	Short Form Name	Height	Width	Depth
1	Timer Group OA-2066/FPN-38	Timer 2	80	69	22
1	Timer Group OA-2067/FPN-38	Timer 1	80	69	22
2	Amplifier AM-2047/FPN-38	RF Amplifier	7	22	12
2	Synchronizer, Electric SN-221/FPN-38	Synchronizer	21-3/16	22	7-3/8
2	Synchronizer, Electric SN-222/FPN-38	Transmitter Adapter	7	22	12
2	Control, Timer Group C-2673/FPN-38	Control Indicator	8-3/4	22	11-1/2
2	Filter, Band Suppression F-408/FPN-38	Filter	8-1/4	22	12
2	Oscillator O-202/FPN-38	RF Oscillator	11	22	21
2	Power Supply PP-2139/FPN-38	Receiver Power Supply	7	22	12
1	Calibrator, Phase TS-1207/FPN-38	Phase Aligner	8-3/4	19	16
1	Generator, Pulse SG-322/FPN-38	Test Pulse Generator	7-3/16	19	12
2	Panel, Power Distribution SB-952/FPN-38	Power Panel	7	19	4-1/2
2	Control, Monitor C-2674/FPN-38	Scope Control	7	19	12
2	Monitor, Phase MX-2613/FPN-38	Monitor Scope	7	19	22-1/4
4	Power Supply PP-2140/FPN-38	+135, −150V Power Supply	7	19	7-1/2
2	Power Supply PP-2137/FPN-38	Dual 28V Power Supply	7	19	13
2	Power Supply PP-2136/FPN-38	12V Power Supply	7	19	13

EQUIPMENT SUPPLIED (cont):

Quantity per Station	Nomenclature		Dimensions in Inches		
	Name and Designation	Short Form Name	Height	Width	Depth
6	Ammeter, Recording ME-157/FPN-38	Recorder	9-1/4	13-3/4	15-1/2
2	Power Supply PP-2138/FPN-38	+150V Power Supply	10-1/2	19	13
1	Switching, Group, Power CA-2068/FPN-38	Signal Entrance Unit	80	22	22
1	Panel, Indicator ID-731/FPN-38	Meter Panel	7	19	5
1	Analyzer, Electrical Pulse TS-1208/FPN-38	Pulse Analyzer	7	19	14
2	Attenuator Assembly CN-528/FPN-38	Switched Attenuator	8	19	12
1	Panel, Signal Distribution SB-954/FPN-38	Power Control Panel	7	19	3-1/4
1	Panel, Power Distribution SB-953/FPN-38	Power Distribution Panel	7	19	4-5/8
1	Panel, WWV Signal Mixing SB-432/U	WWV Signal Mixing Panel	5-1/4	19	12
1		Receiving Antenna			
1		Receiving Antenna Coupler			
1		Screen Room			
2	Motor Generator PU-449/FPN-38	400-cycle Motor Generator			
1	Transformer, Power Isolation TF-191/FPN	Isolation Transformer			
1		Tool Kit			
1		Tool Panel	10-1/2	19	3-1/2
1	Regulator, Voltage CN-717/U	Voltage Regulator	8	15	9

SHIPPING DATA:

Box Number*	Contents	Volume (Cu. Ft.)	Length x Width x Height (Inches)	Weight packed (Pounds)
1	Console	179.1	85 x 38 x 91	1643
2	Phase Aligner, 12V Power Supply, and Dual 28V Power Supply	18.1	68 x 27 x 17	272
3	Synchronizer Circuit Board, Control Indicator Circuit Boards, and 150V Power Supplies (2)	16.3	36 x 26 x 30	182
4	Monitor Scopes (2), R-F Amplifier, Scope Control, Receiver Power Supply, and Filter	39.7	69 x 31 x 32	365

SHIPPING DATA (cont):

Box Number*	Contents	Volume (Cu. Ft.)	Length x Width x Height (Inches)	Weight packed (Pounds)
5	150V Power Supply, Synchronizer, Transmitter Adapter, and Control Indicator	45.1	58 x 36 x 38	438
6	Recorders (3)	20.5	63 x 28 x 20	275
7	100 KC Oscillator	28	57 x 34 x 25	278
8	Console	179.1	85 x 38 x 91	1643
9	Entrance Rack	56.3	36 x 30 x 90	780
10	12V Power Supply, Dual 28V Power Supply, and Test Pulse Generator	18.1	68 x 27 x 17	245
11	Synchronizer and Control Indicator Circuit Boards	16.3	36 x 26 x 30	182
12	Monitor Scopes (2), R-F Amplifier, Scope Control, Receiver Power Supply, and Filter	39.7	69 x 31 x 32	365
13	150V Power Supply, Synchronizer, Transmitter Adapter, and Control Indicator	45.1	58 x 36 x 38	438
14	Recorders (3)	20.5	63 x 28 x 20	275
15	100 KC Oscillator	28	57 x 34 x 25	278
16	Antenna Mount, Antenna, and Raceway	12	84 x 19 x 13	138
17	Pulse Analyzer and Switched Attenuators (2)	18.1	68 x 27 x 17	272
18	Isolation Transformer	6.9	21 x 21 x 27	260

*Box numbers 1 through 7 pertain to Timer Group I; box numbers 8 through 18 pertain to Timer Group II.