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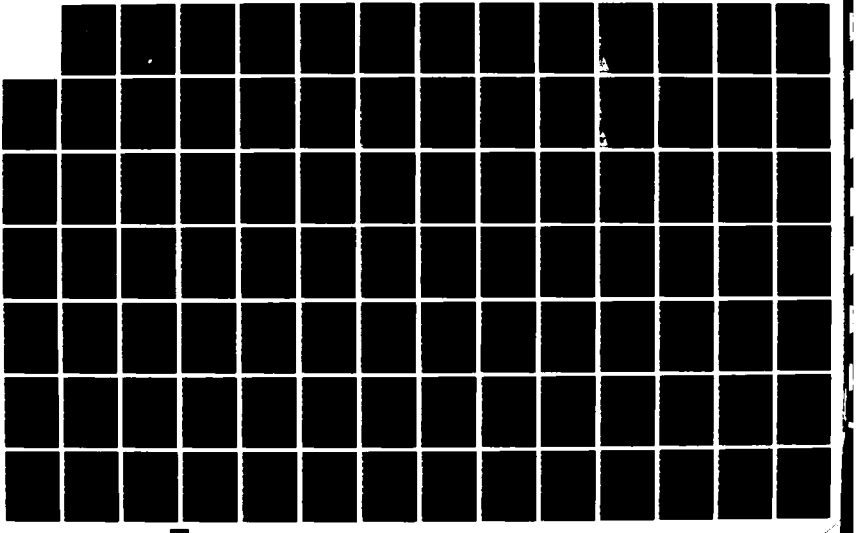

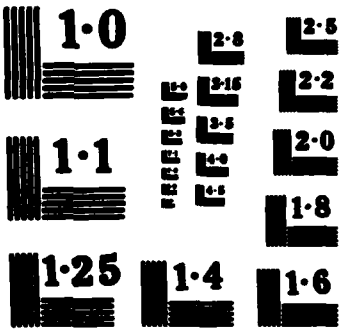
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A Survey of State-of-the-Art LORAN-C Receivers

Franklin D. MacKenzie

Transportation Systems Center
Cambridge MA 02142

June 1984
Final Report

U.S. Department of Transportation
United States Coast Guard

Office of Navigation
LORAN Branch
Washington DC 20593

Technical Report Documentation Page

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
DOT-CG-N-1-84	A144199	

4. Title and Subtitle	5. Report Date
A SURVEY OF STATE-OF-THE-ART LORAN-C RECEIVERS	June 1984
	6. Performing Organization Code: DTS-52
7. Author(s)	8. Performing Organization Report No.
Franklin D. MacKenzie and Martin C. Poppe, Jr.*	DOT-TSC-CG-84-1
9. Performing Organization Name and Address	10. Work Unit No. (TRAIS)
U.S. Department of Transportation Research and Special Programs Administration Transportation Systems Center Cambridge MA 02142	CG437/R4015
	11. Contract or Grant No.: DTRS57-83-C-0029
	13. Type of Report and Period Covered: Final Report Sept. 1982- Feb. 1984
12. Sponsoring Agency Name and Address	14. Sponsoring Agency Code
U.S. Department of Transportation United States Coast Guard Office of Navigation LORAN Branch Washington DC 20593	G-NRN-1

15. Supplementary Notes

*Under contract to: Cambridge Engineering
Cambridge VT 05444

16. Abstract

This report is a summary of the state-of-the-art in LORAN-C receiver design (April 1984). The data sources were manufacturers, designers, and trade literature. Every effort was made to accurately depict the status of receiver design activity in the midst of a volatile LORAN-C receiver market. New receiver models are being introduced monthly; existing models are being modified in response to requests from an expanding user community. Twenty-eight manufacturers have provided the author with data on eighty-five receivers. These receivers are the state-of-the-art technologies. Design features and current trends are included in this report as well as data sheets on each receiver.

17. Key Words	18. Distribution Statement
LORAN-C, Receiver Design, Notch Filters, Conductivity Table, Secondary Phase Corrections, Sea Water Model	DOCUMENT IS AVAILABLE TO THE PUBLIC THROUGH THE NATIONAL TECHNICAL INFORMATION SERVICE, SPRINGFIELD, VIRGINIA 22161

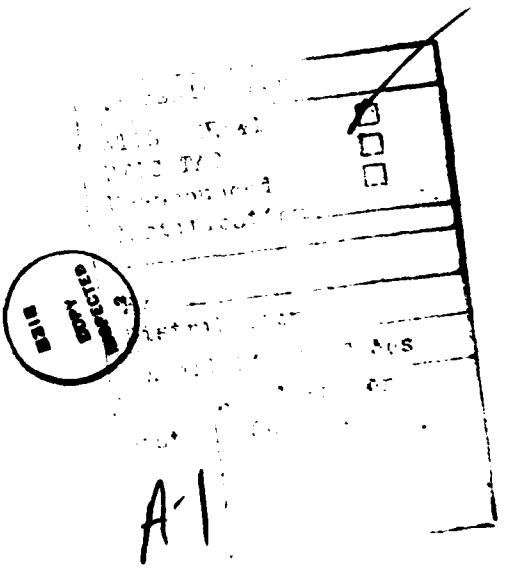
19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price
Unclassified	Unclassified	118	

Form DOT F 1700.7 (8-72) Reproduction of completed page authorized

PREFACE

This report is a summary of the state-of-the-art in LORAN-C receiver design (April 1984). The data sources were manufacturers, designers, and trade shows. Every effort was made to depict the status of receiver design activity accurately, in the midst of a volatile LORAN-C receiver market. New receiver models are being introduced monthly. Existing models are being modified in response to requests from the expanding user community. The work was sponsored by the U.S. Department of Transportation, United States Coast Guard, Office of Navigation. The data collection activity was performed by Cambridge Engineering under contract to the Transportation Systems Center, Office of Operations Engineering, System Evaluation Division, Maurice J. Moroney, Jr., Chief. Technical direction was provided by Franklin D. MacKenzie of the System Evaluation Division.

The work reported here was performed under the sponsorship of the Radionavigation Division, CAPT Douglas G. Currier, Chief. Technical support for the program was given by the LORAN Branch, LCDR William Thrall, Chief. The author wishes to thank the manufacturers for their contributions to the program included on the data sheets in the Appendix.

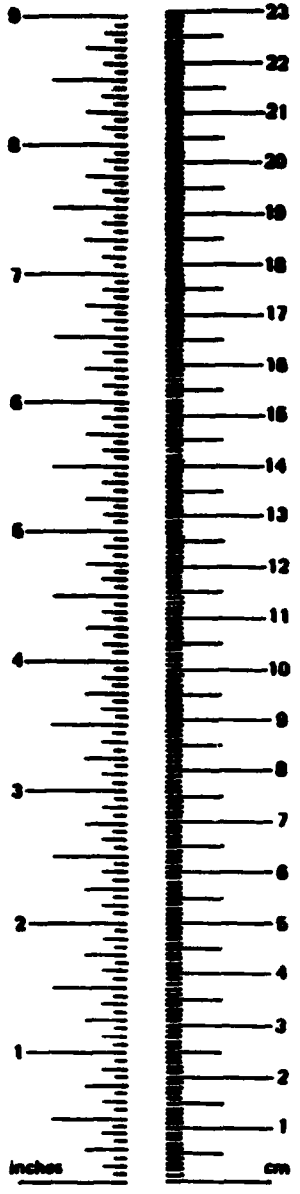


METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

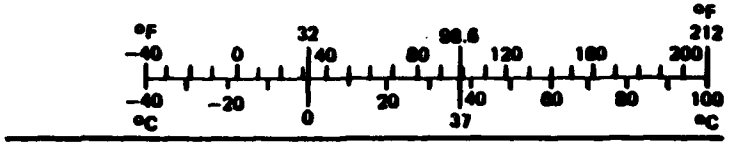
Symbol	When You Know	Multiply by	To Find	Symbol
LENGTH				
in	inches	*2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
AREA				
in^2	square inches	6.5	square centimeters	cm^2
ft^2	square feet	0.09	square meters	m^2
yd^2	square yards	0.8	square meters	m^2
mi^2	square miles	2.6	square kilometers	km^2
	acres	0.4	hectares	ha
MASS (weight)				
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	tonnes	t
VOLUME				
tsp	teaspoons	5	milliliters	ml
Tbsp	tablespoons	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0.24	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.95	liters	l
gal	gallons	3.8	liters	l
ft^3	cubic feet	0.03	cubic meters	m^3
yd^3	cubic yards	0.76	cubic meters	m^3
TEMPERATURE (exact)				
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

*1 in. = 2.54 cm (exactly). For other exact conversions and more detail tables see NBS Misc. Publ. 286, Units of Weight and Measures. Price $2.25 SD Catalog No. C13 10 286.



Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
LENGTH				
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
m	meters	1.1	yards	yd
km	kilometers	0.6	miles	mi
AREA				
cm^2	square centimeters	0.16	square inches	in^2
m^2	square meters	1.2	square yards	yd^2
km^2	square kilometers	0.4	square miles	mi^2
ha	hectares (10,000 m^2)	2.5	acres	
MASS (weight)				
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	
VOLUME				
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	2.1	pints	pt
l	liters	1.06	quarts	qt
l	liters	0.26	gallons	gal
m^3	cubic meters	36	cubic feet	ft^3
m^3	cubic meters	1.3	cubic yards	yd^3
TEMPERATURE (exact)				
°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F



CONTENTS

1. INTRODUCTION

During the Vermont LORAN-C flight evaluation program (1979-1981) only one commercial manufacturer was building aircraft LORAN-C receivers. In 1982, eight manufacturers were either selling or designing new airborne LORAN-C receivers for the commercial and general aviation market. Today twenty-seven LORAN-C receiver manufacturers/distributors selling 85 current models for Aviation (21), Marine (57), Survey (4), Timing (2), and Land (1) (See Table 1) can be identified.

In order to provide the growing number of LORAN-C receiver users with accurate and reliable LORAN-C service and enable them to employ the state-of-the-art features of these new receivers, the impact of present chain control procedures and stated coverage limitations must be examined. The ability of a receiver to operate in the cross-chain mode, for example, would permit areas which presently are not serviced by LORAN-C signals, such as the U.S. mid-continent, the Caribbean and Alaska, to be satisfactorily serviced by adding one or two transmitters. Realizing the potential system benefits which can be derived from the new state-of-the-art receiver designs, the U.S. Coast Guard has initiated a program with the Department of Transportation's Transportation Systems Center (TSC) to track the development and state-of-the-art of LORAN-C receiver designs.

This report contains information on LORAN-C receiver designs, equipment availability, comparative performance, comparative costs, and a forecast of the future direction of LORAN-C receiver designs. Special attention is given to changes in the algorithms developed for receiver control and for position location determination. The effect which these changes have had on improving the LORAN-C system effectiveness is evaluated. The U.S. Coast Guard will assess the impact of these receivers on present plans for the LORAN-C system, and also on future Department of Transportation and U.S. Coast Guard radionavigation plans.

The information contained in this report was developed from a variety of sources:

a. An existing TSC LORAN-C data base, which was created for two previous Project Memorandums (contact TSC Systems Evaluation

TABLE 1. LIST OF LORAN-C RECEIVER MANUFACTURERS/DISTRIBUTORS

MANUFACTURER	MODEL	Marine	Aviation	Survey/ Monitor	Time	Land
Advanced Navigation, Inc.	ANI 7000		X			
Arnav, Inc.	Eagle	X				
	AVA-1000		X			
	ARNAV 50		X			
	ARNAV 60		X			
	ARNAV 20		X			
Austron, Inc.	2100-P				X	
	2100				X	
Datamarine International	4000 Navigator LC	X				
Digital Marine Electronics	Northstar 6000	X				
	Northstar 7000	X				
	Northstar 800	X				
Epsco Marine	C-PLOT Rx	X				
	C-NAV XL	X				
	C-NAV Sx	X				
Foster Airdata	LNS 616		X			
Furuno USA	LC-70	X				
	LC-80	X				
	LC-200	X				
H Morrow, Inc.	Apollo 1		X			
	Avenger 511	X				
	Avenger 501S	X				
	Avenger 512	X				
	Avenger 502SR	X				
International Avionics	LC 300	X				
	LC-403			X		
	LC-404			X		
	LC-406			X		
	LC-360	X				
	LC-720	X				
	LC-1200		X			
International Marine Inst.	CombiLoran 800	X				
King Marine Radio	KING 8001	X				
Megapulse, Inc.	Accufix 500			X		
Micrologic	5000-Portable	X				
	5000A-Portable		X			
	ML-220	X				
	ML-330	X				
	ML-3000	X				
	ML-4000		X			
	ML-2000N	X				
	ML-2000R	X				
	ML-4100		X			
	ML-5000 Basic	X				
Meico (LSA Scientific)	C-MASTER X	X				
	C-MASTER IV	X				
	C-MASTER V	X				
	C-MASTER IV L/L	X				
Motorola, Inc.	MAVL-I					X
Nautical Electronics	Autofix 911	X				
	Autofix 921		X			
	Autofix 911-A		X			
	Autofix 900	X				
Navidyne Corp.	ESZ-7000/N	X				
	ESZ-7000	X				
Offshore Navigation, Inc.	ONI-7000		X			
Racal-Decca Avionics	ADL-81		X			
	ADL-82		X			
Radar Devices, Inc.	RDI-XXXX	X				
Raytheon Marine Co.	RAYNAV 7000	X				
	RAYNAV 750	X				
	RAYNAV 6000	X				
Si-Tex	Si-Tex/Eoden 780	X				
	Si-Tex/Eoden 787	X				
	Si-Tex/Eoden 787C		X			
	Si-Tex/Eoden 717	X				
Simrad, Inc.	TL-838	X				
	TL-886	X				
SRD Labs	CLX-86	X				
	L-NAV 2S		X			
	NLX	X				
Teledyne Systems Company	TL-711A		X			
Texas Instruments	TI-9900	X				
	TI-9900N	X				
	TI-8000	X				
	TI-8000A	X				
	TI-8000N	X				
	TI-8000S	X				
	TI-8100		X			
	TI-9900SP	X				
	TI-9900SPN	X				
	TI-81		X			
	TI-8000NS	X				
Trimble Navigation	Trimble 100A	X				
	Trimble 200	X				
28 MANUFACTURERS	55 RECEIVERS	37	21	4	2	1

Division for availability of documents) entitled "A Review of State-of-the-Art LORAN-C Aviation Receiver Designs," and "A Review of State-of-the-Art-LORAN-C Receivers for the Bureau of the Census".

b. Data sheets obtained from manufacturers. A mailing requesting technical data was sent to all known distributors/manufacturers of LORAN-C receivers. This list was updated as additional manufacturers entered the field.

c. Direct contact with LORAN-C receiver engineering and/or marketing personnel. Telephone conversations and personal contact with LORAN-C receiver designers provided information not normally included in data sheets (e.g., ASF correction techniques).

d. Observations and contacts made at shows and expositions. As a part of the data collection effort, the Northeast Boat Show (Boston MA), the Wild Goose Association Convention (Washington D.C.) and FISH EXPO 83 (Seattle WA) were attended.

2. TECHNICAL DEVELOPMENTS

This section includes background information on technical developments and design techniques employed in LORAN-C receivers. New technology and receiver design are highlighted.

2.1 LATITUDE AND LONGITUDE COMPUTATION

One of the major developments in low-cost, general-purpose LORAN-C receivers has been the incorporation of the computation necessary to display latitude and longitude coordinates, as opposed to time difference (TD) values. While latitude and longitude displays were formerly an expensive option on receivers, they are presently available in several receivers at a total cost of less than $1,000 (Sitex/Koden 787 & MLX). To convert LORAN-C TD values, measured at a specific location, into latitude and longitude coordinates, it is necessary to compensate for propagation delays as LORAN-C signals cross land masses of different conductivity values and pass through areas of varying meteorological conditions. The correction required to produce a true latitude and longitude coordinate from measured TD values is referred to as the additional secondary phase factor (ASF) or land mass correction. Coordinate conversion models were grouped, as follows, in accordance with the classification of ASF techniques presented in a paper by L.M. DePalma[1]:

a. Baseline Model - This model assumes a standard atmosphere in which the effect of the earth's presence is ignored. LORAN-C signals are assumed to propagate at a constant velocity.

b. Seawater Model - This model assumes that signals propagate over an all seawater path on a curved earth with a conductivity value of 5 mho/meter. This model requires a small positive ASF to be added as a function of distance, for distances under 400 miles.

c. Land Model - This model assumes a land path with an average conductivity value of approximately 0.003 mho/meter. For both the land and sea models the ASF correction is a non-linear function of range. The non-linearity effect with range is more pronounced as the conductivity value of the earth's surface decreases. In general, the ASF as a function of range can be represented by low order polynomials.

d. Mixed Path Model - This model assumes that the path from the transmitter to the user consists of segments which are either seawater or land with an average conductivity value. Millington's method is used to compute a total, or integrated, value of ASF.

e. DMA Model - This model is the most complex and the conductivity of each path segment is defined using a five-level conductivity map. Values are calculated by using Millington's method.

The receiver manufacturers contacted to date can be divided into two categories:

a. Those who provide for some form of ASF correction as part of the latitude and longitude computation process.

b. Those who choose to ignore the need for such corrections and, therefore, do not provide them.

All manufacturers contacted were aware of the need to correct latitude and longitude values computed by their receivers to agree with the true latitude and longitude coordinates of known locations. In some designs, this requirement is ignored, and the operator is not provided with the means to enter corrections. However, most receiver designs permit the operator to calibrate the receiver by entering corrections either in the form of ASF from tables, or by entering the true latitude and longitude coordinates at a known location. The receivers which can be calibrated are divided into two groups:

a. Those which treat the entered calibration value as the only correction required. They compute further latitude and longitude values using the baseline standard atmospheric model with a constant bias value (e.g., MLX).

b. Many marine receivers commonly use the calibration at a dock as a way of removing the effect of land mass on the signals traveling to the coast, and then use the all-seawater model to compensate for the additional ASF obtained as the boat moves away from the coast (e.g., Internav LC300).

Several receivers employ more sophisticated ASF correction techniques such as storing TD correction maps or conductivity maps in the computer memory. The raw data from the conductivity maps is used to calculate ASF. Receivers which have stored correction maps in computer memory include the Micrologic 5000, the

AVA-1000, and the Northstar 7000. Receivers which have stored conductivity maps and ASF calculations are the ANI (ONI) 7000 and the Trimble 100/200 receivers. During 1983 there was a trend towards designs that included automatic ASF corrections through the use of correction maps or tables (e.g., ARNAV 20, 50, 60, King 8001, Micrologic 6000).

2.2 MULTI-STATION SOLUTIONS

Traditional LORAN-C position location determination has been accomplished using the TD values produced between the master transmitter and two selected secondaries. In locations where signals are available from more than two secondaries, it is possible to produce position locations from TD values between the master and all stations in the chain. In general, the inclusion of data based on additional stations will produce a more accurate position location fix and the ability to provide continuous latitude and longitude outputs without switching between stations. Proprietary information is not available on the specific computational techniques used in receivers designed for multi-station solutions. However, the following levels of sophistication are identifiable:

a. In the simplest case, a TD value may be treated as an independent measure of a line of position which can be used with another TD value to determine a position location.

b. More sophisticated models incorporate the relative quality of each TD value into the solution, causing stations with a stronger signal at the receiver to be weighted more heavily in the solution than those stations with weaker signals.

c. The most complete multi-station solution will recognize that the signal quality associated with each TD value contains a common element (the master station), and thus the TD values are statistically correlated. This permits the weighting of the various TD values according to their true quality.

A properly performed multi-station solution is inherently master independent (ignoring the problems of receiver lockup without a master station).[2] To sustain this master independence quality, however, it is necessary to recognize that:

a. The covariance matrix has non-zero cross-correlation terms.

b. The precision of mathematics required will be greatly increased if a station of very low quality is selected as the common station.

Receivers using the multi-station solutions include the ANI (ONI) 7000, which is capable of employing the signals from as many as eight different transmitters (from as many as four different chains, see cross-chain below) and the AVA-1000, which is capable of tracking and producing a simultaneous solution using signals from all secondaries in a given chain.

The Trimble receivers employ a multi-station solution in a limited way. Only two TD values are used to compute latitude and longitude coordinates, with a third time TD value (where available) used to resolve the inherent ambiguity present in hyperbolic systems. In particular, Trimble cites a case where identical time difference readings are obtained in California and in Nevada. Although, in this case, the difference in position location should be obvious to the user and hence correctable, the Trimble corrects the readings automatically.

The first low-cost marine receiver employing a multi-station solution is the C-MASTER X from Mieco. This receiver also provides for automatic switching as the user transitions between chains.

2.3 NOTCH FILTERS

Notch filters are included in LORAN-C receiver designs to remove the effects of interfering signals. The frequency band from 90 to 110 kHz is recognized by the International Telecommunications Union as a protected radio navigation band in Region II. However, this band was allocated in terms of radiated transmitter power and not in terms of the bandwidth necessary for a receiver to receive and process LORAN-C signals. In general, LORAN-C receivers are designed with a bandwidth that varies over the range 20 to 40 kHz. For this reason, notch filters are necessary to block interfering signals present in the portion of the frequency spectrum outside of 90 to 110 kHz. Further, in the European regions, (Regions I and III), notch or band-stop filters are required to remove FSK signals which are transmitted in the 90 to 110 kHz band (i.e., 106, 110 kHz).

The number of notch filters added to a receiver depends on the quality of the receiver, its anticipated application, and the geographic area of usage. In general, fewer notch filters are found in low cost receivers. Even in low-cost receivers,

however, the option of procuring a third or fourth notch filter is available to the customer (e.g., the Sitex/Koden 787 has two notch filters with an optional third). The majority of medium-priced and higher performance receivers incorporate between four and six notch filters. The number of notch filters also varies both with anticipated use and area of usage of the receiver. Aircraft receivers typically require more notches than marine receivers because the large operational area of an aircraft platform will make receivers susceptible to many interfering signals. For example, the AVA-1000 includes nine fixed-notch filters, while the ANI (ONI) receiver uses four computer-tuned notch filters and up to four additional fixed-notch filters.

At the beginning of 1983, the C-MASTER X, C-MASTER IX, Northstar 7000 and the Trimble marine receivers were designed with automatic computer-tuned notch filters. At the present time, the use of automatic computer-tuned notch filters in a receiver design is commonplace.

2.4 CROSS-CHAIN OPERATION

Each transmitter in the LORAN-C Navigation System is capable of providing a measure of range from the transmitter to the user provided that the user has a satisfactory time reference against which to measure the time of arrival of the LORAN-C pulse. In theory, it is possible to obtain a LORAN-C position fix using three geometrically dispersed stations which are members of three different chains. In practice, this is not the case for two reasons:

a. The cross-chain repetition interval between chains varies in time. A non-ambiguous measure of TD between two stations from different chains is possible only if the user has some idea of time epoch.

b. The U.S. Coast Guard controls the TD values within a given chain. The emission times between chains is controlled by the U.S. Naval Observatory (USNO) by virtue of the synchronization of each LORAN-C chain with the USNO Master Clock. Interchain time is specified to an accuracy of ± 2.5 μ sec with respect to USNO. While microsecond synchronization times are impressive in terms of absolute time dissemination, they represent large position errors when they are considered as TD errors.

These considerations require the user of cross-chain signal receivers to track at least two stations from each chain, thus providing at least one line of position. The major advantage of using cross-chain operation occurs in areas of marginal coverage such as the mid-continent U.S. and parts of Canada.

Several receivers have cross-chain navigation capability. These are the ANI (ONI) 7000 receiver, which can track up to four chains, and the new receivers available from International Aviation (Internav), the LC-720, the LC-1200 and the LC-480, which can track two chains. Two older airborne receivers, the ADL-81 and the ADL-82, provide cross-chain operation, as each station is tracked by an independent oscillator.

Table 2-1 summarizes the technical developments in LORAN-C Receiver design.

TABLE 2-1. SUMMARY OF LORAN-C RECEIVER TECHNICAL DEVELOPMENTS

MANUFACTURER	MODEL	MANUAL NOTCHES	AUTOMATIC NOTCHES	STATIONS TRACKED, MASTER PLUS	CROSS-CHAIN	ASF TECHNIQUE	LAT/LONG
Advanced Navigation, Inc.	ANI 7000	opt	3	8-MS	4	Model	Yes
Arnav, Inc.	Eagle	8	No	All	No	No	No
	AVA-1000	9	No	All-MS	No	SCM	Yes
	ARNAV 50	9	No	All-MS	No	SCM	Yes
	ARNAV 60	9	No	All-MS	No	SCM	Yes
	ARNAV 20	9	No	All-MS	No	SCM	Yes
Austron, Inc.	2100-F	opt	No	1	N/A	N/A	N/A
	2100	opt	No	1	N/A	N/A	N/A
Datamarine International	4000 Navigator LC	4	No	All	No	Man	Yes
Digital Marine Electronics	Northstar 6000	4	No	All	No	SCM	Yes
	Northstar 7000	ø	4	All-A	No	SCM	Yes
	Northstar 800	8	No	All-A	No	SCM	Yes
Epsco Marine	C-PLOT Rx	4	No	All	No	Man	Yes
	C-NAV XL	4	No	All	No	Man	Yes
	C-NAV SX	4	No	All	No	Man	Yes
Foster Airdata	LNS 616	2	No	All	No	n*	Yes
Furuno USA	LC-70	4	No	?	No	Man	Yes
	LC-80	4	No	5	No	Man	No
	LC-200	4	No	5	No	Man	No
H Morrow, Inc.	Apollo I	8	No	All	No	Man	Yes
	Avenger 511	8	No	All	No	No	No
	Avenger 501B	8	No	All	No	No	No
	Avenger 512	8	No	All	No	No	No
	Avenger 502BR	8	No	All	No	Man	Yes
International Avionics	LC300	4	No	All	No	Man	Yes
	LC403	4	No	4	No	N/A	No
	LC-404	4	No	4	No	N/A	No
	LC-408	4	No	4+4	2	N/A	No
	LC-360	4	No	All	No	Man	Yes
	LC-720	opt	No	4+4	2	Man	Yes
	LC-1200	2	2	4+4	2	Man	Yes
International Marine Inst.	CombiLoran 860	2 opt	4	All	No	Man	Yes
King Marine Radio	KING 8001	2	4	All	No	SCM	Yes
Megapulse, Inc.	Accufix 500	2+opt	No	4	No	N/A	No
Micrologic	5000-Portable	6	No	5	No	SCM	Yes
	5000A-Portable	6	No	5	No	SCM	Yes
	ML-220	7	No	5	No	No	No
	ML-320	7	No	5	No	No	Yes
	ML-3000	6	No	5	No	SCM	Yes
	ML-4000	6	No	5	No	SCM	Yes
	ML-2000N	6	No	All	No	Man	Yes
	ML-2000R	6	No	All	No	No	No
	ML-4100	6	No	All	No	Man	Yes
	ML-5000 Basic	6	No	All	No	SCM	Yes
Meico (LSA Scientific)	C-MASTER X	2+opt	4	All	No	Man	Yes
	C-MASTER IV	2+opt	4	All	No	Man	Yes
	C-MASTER V	?	?	?	?	?	?
	C-MASTER IV L/L	2+opt	4	All	No	Man	Yes
Motorola, Inc.	MAVL-I	?	?	?	?	?	?
Nautical Electronics	Autofix 911	4	No	5	No	Man	Yes
	Autofix 921	?	?	?	?	?	?
	Autofix 911-A	4	No	5	No	Man	Yes
	Autofix 900	4	No	5	No	?	No
Navidyne Corp.	ES2-7000/N	4	No	All-A	No	?	Yes
	ES2-7000	4	No	All	No	No	No
Offshore Navigation, Inc.	ONI-7000	opt	3	8	4	Model	Yes
Racal-Decca Avionics	ADL-81	opt	2	3	2	No	No
	ADL-82	opt	2	3	3	No	No
Radar Devices, Inc.	RDI-????	4	No	4	No	Man	?
Raytheon Marine Co.	RAYNAV 7000	No	4	5	No	?	Yes
	RAYNAV 750	No	6	4	No	Man	Yes
	RAYNAV 6000	2	No	5	No	?	Yes
Si-Tex	Sitex/Koden 760	2	3	All	No	Man	Yes
	Si-Tex/Koden 787	2+opt	No	4	No	No	No
	Si-Tex/Koden 787C	2+opt	No	All	No	Man	Yes
	Si-Tex/Koden 717	1	4	All	No	Man	Yes
Simrad, Inc.	TL-838	6	No	?	No	No	No
	TL-856	6	No	2	No	No	No
SRD Labs	CLX-95	4	No	4	No	Man	Yes
	L-NAV 25	6	No	2	No	Man	Yes
	MLX	4	No	2	No	Man	Yes
Teledyne Systems Company	TL-711A	2	No	4	No	Man	Yes
Texas Instruments	TI-9900	4	No	All	No	Man	Yes
	TI-9000N	4	No	All	No	Man	Yes
	TI-5000	?	?	?	No	Man	Yes
	TI-9000A	4	No	All	No	Man	No
	TI-9000N	4	No	All	No	Man	No
	TI-9000S	4	No	All	No	Man	No
	TI-9100	No	Yes	All	No	Man	Yes
	TI-9900SP	4	No	All	No	Man	Yes
	TI-9900SPN	4	No	All	No	Man	Yes
	TI-91	No	Yes	All	No	Man	Yes
	TI-9100NS	4	No	All	No	Man	No
Trimble Navigation	Trimble 100A	No	4	All	No	Model	Yes
	Trimble 200	No	4	All	No	Model	Yes

KEY: A = automatic selection MS = multi-station solution Man = manual correction entry
SCM = stored correction map used Model = computes for path using propagation model
All = all stations in chain are tracked n* = based on VORTAC position opt = optional

3. LORAN-C MARKET CHANGES AND ADDITIONS

In producing the data base for LORAN-C receivers, an attempt was made to exclude receivers which are no longer available, or which cannot be considered state-of-the-art. This section describes several changes that took place in the LORAN-C market during the past year, namely, new manufacturers, new receivers, and changes in trade names.

The following manufacturer changes have been noted:

a. MORROW, INC. (not to be confused with II Morrow, Inc.) has changed their company name to ARNAV. Their first aviation receiver is the AVA 1000. ARNAV introduced three additional receivers, the ARNAV 20, 50 and 60 in December 1983 and January 1984.

b. INTERNAV (International Navigation, Inc.) has changed their corporate name to International Avionics but will continue to use the name INTERNAV on their LORAN-C receivers. They are introducing four new receivers which were either obtained through, or developed in concert with, their Canadian counterpart, Internav, Ltd. The new receivers are designated the LC-300, LC-720, LC-1200 and LC-480. The LC-300 is a low-cost version of the existing LC-360 receiver. The LC-720 is a dual-chain version of the LC-360. The LC-1200 is a receiver designed for airborne use, while the LC-480 is a dual-chain version of the LC-404 monitor/receiver.

c. MICROLOGIC has introduced the ML-5000 receiver which does not contain either computer-tuned notch filters or full land mass correction. The ML-5000 receiver does have a map of LORAN-C land-mass corrections for the coastal area of North America from Nova Scotia to Alaska, and incorporates self-calibration for envelope to cycle distortion. An additional feature of the receiver is the optional battery pack and antenna, which converts the ML-5000 into a portable battery-operated LORAN-C receiver. In January 1984, Micrologic produced the ML-6000, a low-cost ($2795) aviation receiver.

d. NAVIGATION SYSTEMS, INC., located in Silver Spring, MD, will change their name to RACAL-DECCA AVIONICS, INC. to reflect the purchase of DECCA company and several of its subsidiaries by the RACAL company of England.

e. KING MARINE RADIO CORPORATION is a new company based in Clearwater, FL, which was formed as a wholly-owned subsidiary of King Radio of Orlath, KS. This marks the entry of King Radio into the LORAN-C business. The management staff establishing this division of King Radio came from Sitex/Koden and the engineering personnel came mainly from Bendix Avionics. Their design emphasis has been concentrated on a small unit which is user-friendly. The King 8000 has twenty discrete LEDS, which presumably will be used to cue the operator. The front panel dimensions of the receiver are the same dimensions as the TI-9100.

An estimate of the market share of various manufacturers of both air and marine LORAN-C receivers is shown in Tables 3-1 and 3-2. The market shares shown do not equal 100 percent because they are based on individual manufacturer's estimates (cross-checked with other manufacturers), and reflect different time frames (e.g., in the fall of 1983, ARNAV supplied less than 3 percent of the aviation market. However, they are now estimating a 10 to 15 percent share based on the popularity of their new low-cost ARNAV 20 receiver). The tables should provide a rough indication of the volume suppliers.

TABLE 3-1. MARINE LORAN-C RECEIVERS

MANUFACTURER	MARKET SHARE
Datamarine	**
Epsco	**
Furuno	5%
Micrologic	15%
Meico	**
Nelco	**
Digital Marine	5%
Raytheon	5%
Sitex/Koden	30%
SRD Labs	15%
Texas Instruments	10%
Internav	**
II Morrow	15%
Trimble	**

TABLE 3-2. AIRCRAFT LORAN-C RECEIVERS

MANUFACTURER	TOTAL INSTALLED & WORKING (5000)	NEW INSTALLATIONS II QUARTER 1984
Arnav	8%	30%
ONI	8%	**
Micrologic	12-15%	20%
Teledyne	15%	**
Texas Instruments	25%	**
SRD Labs	10%	10%
II Morrow	20-25%	40%
Foster	1%	**

** indicates less than 5%
Totals do not add to 100% due to uncorrelated nature of estimates.

4. SIGNIFICANT EVENTS

This section contains information which is relevant to state-of-the-art receiver design.

Several manufacturers commented that they are under contract to provide LORAN-C receiver boards for vehicle tracking systems. The potential number of LORAN-C vehicle trackers is in excess of 10,000 units.

On 5 May 1983, Motorola formally introduced their automatic vehicle location receiver and system. This receiver is designed to operate in a fully automatic mode without operator intervention in vehicles, such as taxicabs, containing Motorola VHF communications systems. The receiver does not contain a display, but communicates directly with the vehicle's 2-way radio through a built-in data modem. This receiver was described in the state-of-the-art survey performed for the Census Bureau.

Many general aviation pilots are using low-priced (and in some cases, low quality) marine receivers to provide navigation information for use in VFR operation. It is estimated that 1000 to 2000 receivers of the marine type have been sold to general aviation pilots. The use of a non-approved receiver in the cockpit of an aircraft raises several questions:

1. Will the LORAN-C receiver and its associated microprocessor circuitry interfere with existing aircraft navigation systems?

2. Will unofficial reliance on LORAN-C navigation data produce hazardous operating conditions? For example, a receiver which provides high quality navigation data 90 percent of the time might be relied upon during periods of unflagged but degraded performance (such as could occur during periods of high precipitation static).

The general public knowlege of LORAN-C is growing because of the availability of low-cost receivers. As a result, there is increased pressure to provide complete continental U.S. coverage. An example of this is an inquiry received from the Department of Immigration and Naturalization for a study to explore the possibility of providing LORAN-C position data to immigration agents working along the Mexico/U.S. and Canada/U.S. borders.

An analysis of the receiver design characteristics supplied by various manufacturers indicates a trend towards aircraft versions of standard marine receivers. These receivers differ from their marine counterparts in two respects. First, their time constants have been adjusted to reflect the higher dynamics experienced during aircraft movements. Second, some of the navigation features have changed to reflect aircraft navigation procedures. Receivers in this class include the L-NAV 25 from SRD Labs, the ML-5000A from Micrologic, and the Apollo I from II Morrow, Inc.

New receivers show a decrease in power consumption. Two years ago, receivers typically used between 10 and 20 watts. The new receiver designs such as the SRD Labs receiver, the Meico receivers, the Micrologic 5000, the NELCO receiver, and the Si-Tex/Koden 787 series have power requirements between 5 and 10 watts. This reduction in power is directly attributed to the decrease in power requirements for microprocessors and associated components, and the increased use of low power consumption liquid crystal displays as opposed to LED-type displays.

The general aviation community appears to be adapting very quickly to LORAN-C as a navigation system. The desire to use LORAN-C because it is an available, operationally proven system is evident beyond the general aviation community. For instance, the Norwegian government has decided to proceed with the installation of LORAN-C transmitters along their coastal areas. This decision appears to have been based on both the availability of LORAN-C technology and the control of navigational destiny which Norway would gain through the use of the LORAN-C system (as opposed to basing navigation needs on a global satellite system such as GPS which is being implemented by the U.S. DOD).

As LORAN-C receiver technology is better understood, receiver manufacturers seem to be expanding the capabilities of their receivers to make them more user-friendly. These improvements include: (1) The simplification of both keyboard and display designs to decrease operator training requirements and provide a high degree of user acceptance, and (2) the inclusion of more automatic test features to increase user confidence in the numbers displayed by the receiver.

The ARNAV AVA-1000, the ARNAV 50 and the ARNAV 60 receivers extend coverage by adding the capability to either move their tracking point to the skywave signal or move it to initially acquire a skywave signal. Skywave tracking permits these receivers to work in areas which otherwise are not covered by LORAN-C. When the skywave of the signal is used, the receivers lose their ability to provide absolute position location information. Once initialized, they will compensate for the initial unknown cycle tracking. The receivers are expected to provide quality position location information sufficiently accurate for en route air navigation.

5. BIBLIOGRAPHY

Newcomers to the LORAN-C system often request a list of books or papers which describe the LORAN-C system. The following references are cited:

1. LORAN-C USER HANDBOOK. U.S. Department of Transportation, Coast Guard, COMDTINST M16562.3 (old CG-462), May 1980.

   This publication contains an elementary description of the LORAN-C system and its use. It also includes the status of the various system chains.

2. AUTOMATIC VEHICLE LOCATING SYSTEMS. Edward N. Skomal, Van Nostrand Reinhold Company, 1981.

   This book is a good starting point for anyone interested in vehicle location systems from either a technical (how to do it) or an operational research (what are the benefits) point of view. Chapter 5 includes a general description of the LORAN-C system.

3. "Current Developments in LORAN-C." Robert L. Frank, Proceedings of the IEEE, Vol. 71, No. 10, October 1983.

   A survey of new LORAN-C developments. It includes a brief introduction to LORAN-C, a description of the operation of solid-state transmitters, propagation effects, receivers and hybrid applications. A 136 entry list of references is included.

4. NAVIGATION. Journal of the Institute of Navigation, Volume 29, Number 1, Spring 1982.

   This issue is perhaps the most complete and broad-based description of the LORAN-C system. This issue has been reprinted several times due to demand for copies.

   Contents include:

   History of LORAN-C

   LORAN-C Present and Future

   DMHATC Support to National Ocean Survey LORAN-C Charting

   Benefit/Cost Analysis Applied to LORAN-C Expansion

The LORAN-C Receiver: A Functional Description

Certification of an Airborne LORAN-C Navigation System

Using LORAN-C for Automatic Vehicle Monitoring

Evolution of LORAN-C Coverage

APPENDIX

LORAN-C RECEIVER DATA BASE

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # ANI 7000 ADVANCED NAVIGATION INC
621 LOFSTRAND LN. ROCKVILLE MD. 20850

PHONE 301-424-8730

LIST PRICE (USD): 10/00/81 ADVERTISED PRICE (USD): 20950.00 05/07/83

DESIGNED FOR: A [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches). 7.62 W(inches): 7.5 D(inches). 12.6 VOLUME(cu.in.): 887

WEIGHT (lb): 18.1 TEMP RANGE (deg F): -67,+170

INPUT VOLTAGE: 18-32 POWER REQUIREMENT (Watts): 60

DISPLAY TYPE: FIBER OPTIC 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 7 + 12 POS ROTARY ANTENNA HEIGHT (inches): 6.25

****ASF CORRECTION TECHNIQUE
ASF BASED ON INTERNAL CONDUCTIVITY MAP. USA COVERED

****NOTCH FILTERS
3 AUTOMATIC SOFTWARE TUNED HARDWARE NOTCHES. OPTIONAL FACTORY SET FIXED NOTCHES.

****MICRO-PROCESSOR TYPE(S)
2 6809

****STATIONS TRACKED & HOW USED
8 MAX FROM UP TO FOUR CHAINS

****MULTI-CHAIN CAPABILITY
UP TO FOUR CHAINS

****CERTIFICATIONS
TSO, C-60A, STC FOR IFR, TOTAL NAS PRIMARY NAV. ENROUTE AND TERMINAL

****DYNAMIC RANGE
127 DB

****NOISE BANDWIDTH
35kHZ 3dB

****SENSITIVITY (u VOLTS)
10dB/1uV

****DYNAMIC RANGE
127 DB

****SNR FOR TRACK (MIN)
-18dB

****SNR FOR POSITION DISPLAY
UNKNOWN

****MAX. GDOP FOR LAT-LONG
N/A

*****N1
FULL INTERFACES TAS/NOG, WEATHER RADAR, HSI/RMI, RS-232/HPIL, ADD UP TO $4500

*****N2
SENSOR VERSION $13,500n

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # EAGLE ARNAV INC
4740 RIDGE DR. N.E. POB 7078 SALEM OR 97303-0012
PHONE 503-393-2550

LIST PRICE (USD): 1095.00 09/00/81 ADVERTISED PRICE (USD): 1095.00 05/07/83

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 3.5 W(inches): 8.8- D(inches): 12 VOLUME(cu.in.): 369

WEIGHT (lb): 6 TEMP RANGE (deg F): 32,+122

INPUT VOLTAGE: 6.5-50 POWER REQUIREMENT (Watts): 9-12

DISPLAY TYPE: 2 LOP LED 0-9 KEY PAD? N

NUMBER AND TYPE OF DATA KEYS: THB,6TCH PD,FNCT KEY ANTENNA HEIGHT (inches): 102

****ASF CORRECTION TECHNIQUE
N/A

****NOTCH FILTERS
8 PRE-TUNED

****STATIONS TRACKED & HOW USED
ALL TRACKED; 2 USED AT A TIME

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
NO

****DYNAMIC RANGE
80dB

****MAX. GDOP FOR LAT-LONG
N/A

****NOISE BANDWIDTH
20kHz

****SENSITIVITY (u VOLTS)
+30dB/uV/m

****SNR FOR ACQUISITION
-10dB

****SNR FOR TRACK (MIN)
-15dB

****SNR FOR POSITION DISPLAY
-15dB

****MICRO-PROCESSOR TYPE(S)
8085

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # AVA-1000 ARNAV INC
4740 RIDGE DR. N.E. POB 7078 SALEM OR 97303-0012

PHONE 503-393-2550

LIST PRICE (USD): 09/00/82 ADVERTISED PRICE (USD): 7995.00 05/05/83

DESIGNED FOR: A [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): W(inches): D(inches): VOLUME(cu.in.):

WEIGHT (lb): 4.8 TEMP RANGE (deg F): -4,+130

INPUT VOLTAGE: 10-45 POWER REQUIREMENT (Watts):

DISPLAY TYPE: A-N, LED, DOT MATRIX 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 20 PUSH-BUTTON ANTENNA HEIGHT (inches): 19

****ASF CORRECTION TECHNIQUE
MAP IN CONVERSION ALGORITHM

****NOTCH FILTERS
9 PRESET

****STATIONS TRACKED & HOW USED
ALL STATIONS TRACKED, ALL USED IN NAV SOLUTION

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
TSO, IFR(STC)

****MAX. GDOP FOR LAT-LONG
NOT DEFINED

****NOISE BANDWIDTH
20kHz

****SENSITIVITY (u VOLTS)
+30dB/uV/METER

****SNR FOR ACQUISITION
-10dB

****SNR FOR TRACK (MIN)
-20dB

****SNR FOR POSITION DISPLAY
020dB (WARNING BELOW)

****DYNAMIC RANGE
100dB

****MICRO-PROCESSOR TYPE(S)
TWO, Z-80A

*****N1
EXTENDED RANGE OPTION AVAILABLE, USES SKY AND GROUND WAVE

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # ARNAV 50 ARNAV INC
4740 RIDGE DR. N.E. POB 7078 SALEM OR 97303-0012

PHONE 503-393-2550

LIST PRICE (USD): ADVERTISED PRICE (USD): 7995.00 11/00/83

DESIGNED FOR: A [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 3.25 W(inches): 6.25 D(inches): 10.7 VOLUME(cu.in.): 217.3

WEIGHT (lb): 4.8 TEMP RANGE (deg F): -4, +131

INPUT VOLTAGE: 10-55 POWER REQUIREMENT (Watts): 19

DISPLAY TYPE: LED DOT MATRIX 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 16+11SEC, SEL SW ANTENNA HEIGHT (inches):

****ASF CORRECTION TECHNIQUE
MAP

****STATIONS TRACKED & HOW USED
MASTER + ALL SECONDARIES, ALL STATIONS USED FOR FIX

****NOTCH FILTERS
9 FIXED

****MICRO-PROCESSOR TYPE(S)
2, Z-80

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
PENDING TSO, IFR

****DYNAMIC RANGE
100 dB

****MAX. GDOP FOR LAT-LONG
UK

****NOISE BANDWIDTH
20 kHz

****SENSITIVITY (u VOLTS)
3 uV/M

****SNR FOR ACQUISITION
-10 dB

****SNR FOR POSITION DISPLAY
-20 dB

****SNR FOR TRACK (MIN)
-20 dB

*****N1
DESIGED FOR LIMITED COVERAGE AREAS, USING SKYWAVE

*****N2
WAYPOINTS, 200 ALPHABETIZED, DATA ENTRY & DISPLAY

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # ARNAV 60 ARNAV INC
4740 RIDGE DR. N.E. POB 7078 SALEM OR 97303-0012

PHONE 503 393-2550

LIST PRICE (USD): ADVERTISED PRICE (USD): 9495.00 11/00/83

DESIGNED FOR: A [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 7 W(inches): 4.75 D(inches): 10 VOLUME(cu.in.):

WEIGHT (lb): 5.5 TEMP RANGE (deg F): -67,+158

INPUT VOLTAGE: 10-45 POWER REQUIREMENT (Watts): 19

DISPLAY TYPE: LED, DOT MATRIX 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 16+11 SEC, SEL.SW. ANTENNA HEIGHT (inches):

****ASF CORRECTION TECHNIQUE
MAP

****STATIONS TRACKED & HOW USED
MASTER + ALL SECONDARIES, ALL STATIONS USED FOR FIX

****NOTCH FILTERS
9 FIXED

****MICRO-PROCESSOR TYPE(S)
Z-80

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
PENDING TSO, IFR

****DYNAMIC RANGE
100dB

****MAX. GDOP FOR LAT-LONG
UK

****NOISE BANDWIDTH
20 kHz

****SENSITIVITY (u VOLTS)
+3 uV/METER

****SNR FOR ACQUISITION
-10 dB

****SNR FOR POSITION DISPLAY
-20 dB

****SNR FOR TRACK (MIN)
-20 dB

*****N1
LOFF OPTION, $1500 PREAMP RANGE -67,+158

*****N2
DESIGNED FOR LIMITED COVERAGE AREAS, USING SKYWAVE, SAYPOINTS ALPHABETIZED

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # ARNAV 20 ARNAV INC.
4740 RIDGE DR. N.E. POB 7078 SALEM OR 97303-0012

PHONE 503-393-2550

LIST PRICE (USD): ADVERTISED PRICE (USD): 2795.00 11/00/83

DESIGNED FOR: A [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 3.25 W(inches): 6.25 D(inches): 10.7 VOLUME(cu.in.):

WEIGHT (lb): 4.6 TEMP RANGE (deg F): -20,+55

INPUT VOLTAGE: POWER REQUIREMENT (Watts):

DISPLAY TYPE: 0-9 KEY PAD?

NUMBER AND TYPE OF DATA KEYS: ANTENNA HEIGHT (inches):

****ASF CORRECTION TECHNIQUE
MAP

****STATIONS TRACKED & HOW USED
MASTER + ALL SECONDARIES, ALL STATIONS USED FOR FIX

****NOTCH FILTERS
9 FIXED

****MICRO-PROCESSOR TYPE(S)
Z-80

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
VFR, BEING TESTED TO TSO STANDARDS

****DYNAMIC RANGE
100Db

****MAX. GDOP FOR LAT-LONG
UK

****NOISE BANDWIDTH
20 KhZ

****SENSITIVITY (u VOLTS)
3uV/Mm

****SNR FOR ACQUISITION
-10 dB

****SNR FOR POSITION DISPLAY
-20 dB

****SNR FOR TRACK (MIN)
-20 dB

*****NI
WAYPOINTS : 200 ALPHABETIZED

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # 2100-F AUSTRON INC
POB 14766 AUSTIN,TX 78761

PHONE 512-251-2341

LIST PRICE (USD): ADVERTISED PRICE (USD):

DESIGNED FOR: T [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 3.5 W(inches): 14.5 D(inches): 19 VOLUME(cu.in.): 964

WEIGHT (lb): 20 TEMP RANGE (deg F): 32-122

INPUT VOLTAGE: 115VAC POWER REQUIREMENT (Watts):

DISPLAY TYPE: LCD, 8 DIGITS 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: +11PBS ANTENNA HEIGHT (inches):

****ASF CORRECTION TECHNIQUE
PROGRAMMED FOR USER BASED ON MEASUREMENTS

****STATIONS TRACKED & HOW USED
SELECTS FIRST IN CHAIN THAT MEETS CRITERIA

****NOTCH FILTERS
PROVIDED BY OPTIONAL FILTER BOX, MODEL 2080, 2082 OR 2084

****MICRO-PROCESSOR TYPE(S)
6800

****MULTI-CHAIN CAPABILITY
NA

****CERTIFICATIONS
NA

****DYNAMIC RANGE
127 dB SOFTWARE CONTROLLED ATTENUATOR

****MAX. GDOP FOR LAT-LONG
NA

****NOISE BANDWIDTH
40 kHz

****SENSITIVITY (u VOLTS)
.01uV INTO 50 OHMS

****SNR FOR ACQUISITION
-20dB

****SNR FOR POSITION DISPLAY
NA

*****NI
THIS RECEIVER IS DESIGNED AS A FREQUENCY COMPARISON UNIT

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # 2100

AUSTRON INC.
POB 14766 AUSTIN, TX 78761
PHONE 512-251-2341

LIST PRICE (USD): ADVERTISED PRICE (USD): 10740.00 11/00/83

DESIGNED FOR: T [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 3.5 W(inches): 14.5 D(inches): 19 VOLUME(cu.in.): 964

WEIGHT (lb): 20 TEMP RANGE (deg F): 32-122

INPUT VOLTAGE: 115VAC POWER REQUIREMENT (Watts):

DISPLAY TYPE: LCD, 8 DIGITS 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: +15PBS ANTENNA HEIGHT (inches):

****ASF CORRECTION TECHNIQUE
PROGRAMMED FOR USER BASED ON MEASUREMENTS

****STATIONS TRACKED & HOW USED
TRACKS SINGLE STATION FOR TIME MEASUREMENT

****NOTCH FILTERS
EXTERNAL MODEL 2080.2082,2084

****MICRO-PROCESSOR TYPE(S)
6800

****MULTI-CHAIN CAPABILITY
NA

****CERTIFICATIONS
NA

****DYNAMIC RANGE
127dB PROGRAMMABLE ATTENUATOR

****MAX. GDOP FOR LAT-LONG
NA

****NOISE BANDWIDTH
40kHz -3dB, 40dB TRACK 4kHz

****SENSITIVITY (u VOLTS)
.01uV INTO 50 OHM

****SNR FOR ACQUISITION
-28dB

****SNR FOR POSITION DISPLAY
NA

****SNR FOR TRACK (MIN)
>30dB ATMOSPHERIC

*****N1
TIMING RECEIVER AUTOMATIC ACQUISITION

*****N2

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # 4000 NAVIGATOR LC DATAMARINE INTERNATIONAL INC
53 PORTSIDE DRIVE,POCASSET,MA 02559

PHONE 617-563-7151

LIST PRICE (USD): 2595.00 02/00/81 ADVERTISED PRICE (USD): 1995.00 05/07/83

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 4.25 W(inches): 10.5 D(inches): 12.7 VOLUME(cu.in.): 566

WEIGHT (lb): 7 TEMP RANGE (deg F): +32-+120

INPUT VOLTAGE: 10-16 POWER REQUIREMENT (Watts): 15

DISPLAY TYPE: 2-LOP LED 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 10 ANTENNA HEIGHT (inches): 96

****ASF CORRECTION TECHNIQUE
KEYBOARD ENTRY

****NOTCH FILTERS
FOUR, 30dB FILTERS, 2 FIXED, 2 EXTERNAL

****MICRO-PROCESSOR TYPE(S)
8085

****STATIONS TRACKED & HOW USED
ALL WITHIN SELECTED CHAIN

****MULTI-CHAIN CAPABILITY
ALL CHAINS OPERATIONAL (NO CROSS CHAIN)

****CERTIFICATIONS

****DYNAMIC RANGE
80dB PLUS 20dB STEP ATTENUATION FOR STRONG STATION

****MAX. GDOP FOR LAT-LONG
NO LIMIT

****NOISE BANDWIDTH
20kHz - 3dB

****SENSITIVITY (u VOLTS)
5uV

****SNR FOR ACQUISITION
-20dB

****SNR FOR TRACK (MIN)
GREATER THAN -20dB

****SNR FOR POSITION DISPLAY
APPROXIMATELY -18dB SNR LAMP WILL ILLUMINATE

*****N1
WAYPOINTS,8 TRACK SPEED 50 KTS

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # NORTHSTAR 6000 DIGITAL MARINE ELECTRONICS CRP
30 SUDBURY RD. ACTON MA 01720

PHONE 617-897-6600

LIST PRICE (USD): ADVERTISED PRICE (USD): 2995.00 10/29/83

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 9.5 W(inches): 16 D(inches): 11 VOLUME(cu.in.): 1672

WEIGHT (lb): 25 TEMP RANGE (deg F): 32-140

INPUT VOLTAGE: 10-40 POWER REQUIREMENT (Watts): 50

DISPLAY TYPE: LED 0-9 KEY PAD? N

NUMBER AND TYPE OF DATA KEYS: 6 ROTARY SW ANTENNA HEIGHT (inches):

****ASF CORRECTION TECHNIQUE
TABLE LOOKUP

****STATIONS TRACKED & HOW USED
GRI ALL STATIONS, LAT/LONG, MANUAL OVERRIDE

****NOTCH FILTERS
2 INTERNAL, 2 OPERATOR ADJUSTABLE

****MICRO-PROCESSOR TYPE(S)
8080

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
RTCM

****DYNAMIC RANGE
120 dB

****MAX. GDOP FOR LAT-LONG
NO

****SENSITIVITY (u VOLTS)
0.8 uV

****SNR FOR ACQUISITION
-25 dB

****SNR FOR POSITION DISPLAY
-25 dB

****SNR FOR TRACK (MIN)
-25 dB

*****N1
WAYPOINTS, 120

*****N2
TRACK SPEED, 200 KTS

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # NORTHSTAR 7000 DIGITAL MARINE ELECTRONICS CRP
30 SUDBURY RD. ACTON MA 01720

PHONE 617-897-6600

LIST PRICE (USD): ADVERTISED PRICE (USD): 2995.00 10/28/83

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 7.25 W(inches): 12.7 D(inches): 12.5 VOLUME(cu.in.): 1151

WEIGHT (lb): 24 TEMP RANGE (deg F):

INPUT VOLTAGE: 10-40 POWER REQUIREMENT (Watts): 15

DISPLAY TYPE: 2xLOP LCD 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 26 ANTENNA HEIGHT (inches): 96

****ASF CORRECTION TECHNIQUE
AUTOMATIC CORRECTION TECHNIQUE, TABLE LOOKUP

****NOTCH FILTERS
FOUR AUTOMATIC HIGH DYNAMIC RANGE

****MICRO-PROCESSOR TYPE(S)
8085

****STATIONS TRACKED & HOW USED
SINGLE GRI; TRACKS ALL SECONDARIES, AUTO-SELECTS PREFERRED PAIR OF SECONDARIES

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
DESIGNED TO RTCM MPS 70

****DYNAMIC RANGE
120 dB

****MAX. GDOP FOR LAT-LONG
PRODUCES MESSAGE WHICH STATES "LAT/LONG MAY BE POOR BASED ON JITTER
EVAUATION OF FAR CORNERS OF RHOMBOID"

****NOISE BANDWIDTH
UNKNOWN

****SENSITIVITY (u VOLTS)
0.6 uV

****SNR FOR ACQUISITION
-25 dB

****SNR FOR TRACK (MIN)
-25 dB

****SNR FOR POSITION DISPLAY
-25 dB

*****N1
CDU #1 : H 4.5, W 7.25, D 8, CU IN 261, WEIGHT 4 COST $895, POWER REQUIREMENT 1.5w

*****N2
CDU #2 : H 7, W 14, D 3.75, CU IN 367.5), WEIGHT 7, POWER REQUIREMENT 7.5W

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # NORTHSTAR 800 DIGITAL MARINE ELECTRONICS CRP
30 SUDBURY RD. ACTON, MA 01720

PHONE 617-897-6600

LIST PRICE (USD): ADVERTISED PRICE (USD): 2395.00 10/29/83

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 4 W(inches): 9.5 D(inches): 10.5 VOLUME(cu.ins): 410.5

WEIGHT (lb): <12 TEMP RANGE (deg F): 32-140

INPUT VOLTAGE: 12 POWER REQUIREMENT (Watts): 15

DISPLAY TYPE: LCD 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 26, PRESR.SNSTV.MBRN ANTENNA HEIGHT (inches):

****ASF CORRECTION TECHNIQUE
TABLE LOOKUP

****STATIONS TRACKED & HOW USED
ONE GRI ALL SLAVES, LORAN A CONVERSION, LAT/LONG CONVERSION, MANUAL OVERRIDE

****NOTCH FILTERS
8 FIXED

****MICRO-PROCESSOR TYPE(S)
8085

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
RTCM

****DYNAMIC RANGE
120 dB

****MAX. GDOP FOR LAT-LONG
"LAT/LONG MAY BE POOR" MESSAGE

****NOISE BANDWIDTH

****SENSITIVITY (u VOLTS)
.6 uV

****SNR FOR ACQUISITION
-25 dB

****SNR FOR POSITION DISPLAY
-25 dB

****SNR FOR TRACK (MIN)
-25 dB

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # C-PLOT RX EPSCO MARINE
411 PROVIDENCE HWY, WESTWOOD MA. 02090

PHONE 617-329-1500

LIST PRICE (USD): ADVERTISED PRICE (USD): $995.00 10/29/83

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): W(inches): D(inches): VOLUME(cu.in.):

WEIGHT (lb): 50 TEMP RANGE (deg F):

INPUT VOLTAGE: *** POWER REQUIREMENT (Watts): 65

DISPLAY TYPE: LED 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 29, MEMBRANE ANTENNA HEIGHT (inches): 96

****ASF CORRECTION TECHNIQUE
MANUAL

****STATIONS TRACKED & HOW USED
1 GRI, ALL SECONDARIES

****NOTCH FILTERS
4

****MICRO-PROCESSOR TYPE(S)
8085

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
NONE

****DYNAMIC RANGE
STEP AGC

****MAX. GDOP FOR LAT-LONG
NO LIMIT

****NOISE BANDWIDTH
20 kHz, 3dB

****SENSITIVITY (u VOLTS)
5 uV

****SNR FOR ACQUISITION
-20 dB

****SNR FOR POSITION DISPLAY
-18 dB

****SNR FOR TRACK (MIN)
-20 dB

*****N1
NON-VOLATILE MEMORY ON TD DEST. AND CORR.

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # C-NAV XL EPSCO MARINE
411 PROVIDENCE HWY, WESTWOOD MA. 02090

PHONE 617-329-1500

LIST PRICE (USD): ADVERTISED PRICE (USD): 2995.00 11/00/83

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 4.25 W(inches): 10.5 D(inches): 12.7 VOLUME(cu.in.): 566

WEIGHT (lb): 7 TEMP RANGE (deg F): +32-+120

INPUT VOLTAGE: 10-40 POWER REQUIREMENT (Watts): 25

DISPLAY TYPE: 2-LOP LED 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 0 +2 +12 ANTENNA HEIGHT (inches): 96

****ASF CORRECTION TECHNIQUE
KEYBAORD ENTRY

****NOTCH FILTERS
FOUR, 30 dB FILTERS

****MICRO-PROCESSOR TYPE(S)
8085

****STATIONS TRACKED & HOW USED
ALL WITHIN SELECTED CHAIN, AUTO SELECT 2 STRONGEST SECONDARIES, OPERATOR OVERRIDE

****MULTI-CHAIN CAPABILITY
ALL CHAINS OPERATIONAL (NO CROSS-CHAIN)

****CERTIFICATIONS
NORWEGIAN MARITIME DIRECTORATE 851357-81

****DYNAMIC RANGE
80dB PLUS 20dB STEP ATTENUATION FOR STRONG CHAIN

****MAX. GDOP FOR LAT-LONG
NO LIMIT

****NOISE BANDWIDTH
20 kHz, 3dB

****SENSITIVITY (u VOLTS)
5 uV

****SNR FOR ACQUISITION
-20dB

****SNR FOR TRACK (MIN)
GREATER THAN -20 dB

****SNR FOR POSITION DISPLAY
APPROXIMATELY -18dB SNR LAMP WILL ILLUMINATE

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # C-NAV SX EPSCO MARINE
411 PROVIDENCE HWY, WESTWOOD MA. 02090

PHONE 617-329-1500

LIST PRICE (USD): ADVERTISED PRICE (USD):

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 4.25 W(inches): 10.5 D(inches): 12.7 VOLUME(cu.in.): 566

WEIGHT (lb): 7 TEMP RANGE (deg F): +32-+120

INPUT VOLTAGE: 10-16 POWER REQUIREMENT (Watts): 15

DISPLAY TYPE: 2-LOP LED 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 10 ANTENNA HEIGHT (inches): 96

****ASF CORRECTION TECHNIQUE
KEYBOARD ENTRY

****NOTCH FILTERS
FOUR, 30dB FILTERS

****MICRO-PROCESSOR TYPE(S)
8085

****STATIONS TRACKED & HOW USED
ALL WITHIN SELECTED CHAIN

****MULTI-CHAIN CAPABILITY
ALL CHAINS OPERATIONAL (NO CROSS CHAIN)

****CERTIFICATIONS
NORWEGIAN MARITIME DIRECTORATE 851357-81

****DYNAMIC RANGE
80dB PLUS 20dB STEP ATTENUATION FOR STRONG CHAIN

****MAX. GDOP FOR LAT-LONG
NO LIMIT

****NOISE BANDWIDTH
20kHz, 3dB

****SENSITIVITY (u VOLTS)
5uV

****SNR FOR ACQUISITION
-20dB

****SNR FOR TRACK (MIN)
GREATER THAN -20dB

****SNR FOR POSITION DISPLAY
APPROXIMATELY -18dB SNR LAMP WILL ILLUMINATE

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # LNS 616 FOSTER AIRDATA SYSTEMS INC.
7020 HUNTLEY RD COLUMBUS OH 43229

PHONE 614-888-9520

LIST PRICE (USD): 12500.00 05/07/83 ADVERTISED PRICE (USD):

DESIGNED FOR: A [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 5.26 W(inches): 4.15 D(inches): 11.0 VOLUME(cu.in.): 345

WEIGHT (lb): 9.25 TEMP RANGE (deg F): -67,+158

INPUT VOLTAGE: 18-32 POWER REQUIREMENT (Watts): 30

DISPLAY TYPE: LED 2-LOP 0-9 KEY PAD? N

NUMBER AND TYPE OF DATA KEYS: 4 + 8 POS ROTARY ANTENNA HEIGHT (inches):

****ASF CORRECTION TECHNIQUE
CALCULATED FROM VORTAC POSITION

****STATIONS TRACKED & HOW USED
FIX BASED ON THREE. TRACKS ALL.

****MULTI-CHAIN CAPABILITY
NO

****MICRO-PROCESSOR TYPE(S)

****CERTIFICATIONS

****DYNAMIC RANGE

****MAX. GDOP FOR LAT-LONG

****NOISE BANDWIDTH

****SENSITIVITY (u VOLTS)

****SNR FOR ACQUISITION

****SNR FOR TRACK (MIN)

****SNR FOR POSITION DISPLAY

****NOTCH FILTERS

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # LC-70 FURUNO U.S.A.,INC
POB 2343, 271 HARBOR WAY, S SAN FRANCISCO CA 94080

PHONE 415 873-9393

LIST PRICE (USD): ADVERTISED PRICE (USD): 2795.00 10/?0/8?

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 5.1 W(inches): 9.9 D(inches): 11 VOLUME(cu.in.): 555

WEIGHT (lb): 11 TEMP RANGE (deg F): 32,+122

INPUT VOLTAGE: 10-42 POWER REQUIREMENT (Watts): 35

DISPLAY TYPE: 2_LOP LCD 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 1 + 10 SEC FUNCT ANTENNA HEIGHT (inches): 96

****ASF CORRECTION TECHNIQUE
MANUAL INPUT

****NOTCH FILTERS
2 INTERNAL, 2 EXTERNAL

****MICRO-PROCESSOR TYPE(S)

****STATIONS TRACKED & HOW USED

****MULTI-CHAIN CAPABILITY

****CERTIFICATIONS

****DYNAMIC RANGE
100 dB

****MAX. GDOP FOR LAT-LONG

****NOISE BANDWIDTH

****SENSITIVITY (u VOLTS)
>1uV/M

****SNR FOR ACQUISITION

****SNR FOR TRACK (MIN)

****SNR FOR POSITION DISPLAY

*****N1
AVAILABLE ONLY ON SPECIAL ORDER BASIS

*****N2
TRACK SPEED 40 KTS, WAYPOINTS, 32

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # LC-80 FURUNO U.S.A.,INC
POB 2343, 271 HARBOR WAY, S SAN FRANCISCO CA 94080

PHONE 415 873-9393

LIST PRICE (USD): 1395.00 ADVERTISED PRICE (USD):

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 4 W(inches): 10 D(inches): 11 VOLUME(cu.in.): 440

WEIGHT (lb): 5 TEMP RANGE (deg F): 32-+131

INPUT VOLTAGE: 10-42 POWER REQUIREMENT (Watts): 12

DISPLAY TYPE: 2_LOP LCD 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 17 ACTIVE KEYS ANTENNA HEIGHT (inches): 96

****ASF CORRECTION TECHNIQUE
MANUAL DELTA TDS

****NOTCH FILTERS
MANUAL, TWO EXTERNAL, TWO INTERNAL, 30dB/NOTCH

****MICRO-PROCESSOR TYPE(S)
JAPANESE

****STATIONS TRACKED & HOW USED
MASTER PLUS 5 SECONDARIES, MANUALLY SELECTED TD PAIRS

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
RTCM 12/78/D-100

****DYNAMIC RANGE
80dB

****MAX. GDOP FOR LAT-LONG
NO

****NOISE BANDWIDTH
TBD

****SENSITIVITY (u VOLTS)
1uV/METER

****SNR FOR ACQUISITION
"ABOUT 30"

****SNR FOR TRACK (MIN)
"ABOUT 20" LOSE TK, 0-100 WARNING ON DISPLAY

****SNR FOR POSITION DISPLAY
HANGS ON AS LONG AS TK

*****N1
CONTINUES TO DISPLAY BUT WITH WARNING, AND CONTINUES TO OUTPUT TO PLOTTER/COMPUTER INTERFACE, BUT WARNS OF BAD DATA

*****N2
TRACK SPEED 40 KTS, WAYPOINTS, 10

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # LC-200

FURUNO U.S.A.,INC
POB 2343, 271 HARBOR WAY, S SAN FRANCISCO CA 94080

PHONE 415 873-9393

LIST PRICE (USD): ADVERTISED PRICE (USD):

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 4.25 W(inches): 13 D(inches): 13.3 VOLUME(cu.in.): 734

WEIGHT (lb): 12 TEMP RANGE (deg F): 32,+122

INPUT VOLTAGE: 10-48 POWER REQUIREMENT (Watts): 20

DISPLAY TYPE: 2-LOP LED 0-9 KEY PAD? N

NUMBER AND TYPE OF DATA KEYS: 7 ROTARY SW'S + TOGG ANTENNA HEIGHT (inches): 96

****ASF CORRECTION TECHNIQUE
MANUALLY ENTERED

****NOTCH FILTERS
4 , TWO EXTERNAL, TWO INTERNAL

****MICRO-PROCESSOR TYPE(S)
UNKNOWN

****STATIONS TRACKED & HOW USED
TRACKS ALL STATIONS, 2 LOP MANUALLY SELECTED

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
MEETS U.S.COAST GUARD SPECIFICATIONS FOR VESSELS OF 1600GT AND ABOVE

****DYNAMIC RANGE
UNKNOWN

****MAX. GDOP FOR LAT-LONG
N/A

****NOISE BANDWIDTH
24kHZ, 3dB (TRACKING)

****SENSITIVITY (u VOLTS)
UNKNOWN

****SNR FOR ACQUISITION
UNKNOWN

****SNR FOR TRACK (MIN)
UNKNOWN

****SNR FOR POSITION DISPLAY
UNKNOWN

*****NI
NOT CURRENTLY IN PRODUCTION

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # APOLLO I II MORROW INC
2777 19th S.E. POB 13549, SALEM OREGON 97309

PHONE 503-581-8101

LIST PRICE (USD): 2495.00 05/07/83 ADVERTISED PRICE (USD): 1595.00 11/10/83

DESIGNED FOR: A [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 3.75 W(inches): 8.85 D(inches): 11.7 VOLUME(cu.in.): 388

WEIGHT (lb): 3.5 TEMP RANGE (deg F): -4,+158

INPUT VOLTAGE: 6.5-48 POWER REQUIREMENT (Watts): 8-12

DISPLAY TYPE: LED LAT/LONG OR ZLOP 0-9 KEY PAD? N

NUMBER AND TYPE OF DATA KEYS: 8 PUSHBTN, 1 ROTARY ANTENNA HEIGHT (inches): 21

****ASF CORRECTION TECHNIQUE
MANUAL CALIBRATION OF LAT/LONG

****NOTCH FILTERS
8 PRESET

****STATIONS TRACKED & HOW USED
ALL SECONDARIES TRACKED, USER DEFINES TRIAD FOR NAVIGATION

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
TSO

****DYNAMIC RANGE
120dB

****MAX. GDOP FOR LAT-LONG
WARNING LIGHT, BAD ECDS

****NOISE BANDWIDTH
23kHz AT RECEIVER OUTPUT, 13 AT -3, 25 OR LESS AT -40

****SENSITIVITY (u VOLTS)
1uV (ATMOSPHERIC NOISE LIMITED)

****SNR FOR ACQUISITION
-12dB

****SNR FOR TRACK (MIN)
>-20dB AND CONTINUE TO GIVE POSITION

****SNR FOR POSITION DISPLAY
WARNING LIGHT -10dB

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # AVENGER 511 II MORROW INC
2777 19th S.E. POB 13549, SALEM OREGON 97309

PHONE 503-581-8101

LIST PRICE (USD): ADVERTISED PRICE (USD): 1095.00 11/10/83

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 3.75 W(inches): 8.63 D(inches): 11.7 VOLUME(cu.in.): 388

WEIGHT (lb): 6.5 TEMP RANGE (deg F): 32,+122

INPUT VOLTAGE: 6.5-48 POWER REQUIREMENT (Watts): 9

DISPLAY TYPE: 2-LOP LCD 0-9 KEY PAD? N

NUMBER AND TYPE OF DATA KEYS: 9 PUSH BUTTON ANTENNA HEIGHT (inches): 96

****CERTIFICATIONS
NONE

****ASF CORRECTION TECHNIQUE
NONE

****DYNAMIC RANGE
110 dB

****MICRO-PROCESSOR TYPE(S)
8085

****MAX. GDOP FOR LAT-LONG
N/A

****NOISE BANDWIDTH
23kHz AT RECEIVER OUTPUT

****SENSITIVITY (u VOLTS)
1uV (ATMOSPHERIC NOISE LIMITED)

****SNR FOR ACQUISITION
-10 DB

****SNR FOR TRACK (MIN)
-30dB

****STATIONS TRACKED & HOW USED
ALL SECONDARIES TRACKED, USER DEFINES TRIAD FOR NAVIGATION

****SNR FOR POSITION DISPLAY
-30dB

****NOTCH FILTERS
8 PRESET

****MULTI-CHAIN CAPABILITY
NO

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # AVENGER 501B II MORROW INC
2777 19th S.E. POB 13549, SALEM OREGON 97309

PHONE 503-581-8101

LIST PRICE (USD): ADVERTISED PRICE (USD): 1095.00 11/10/83

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 3.75 W(inches): 8.85 D(inches): 11.7 VOLUME(cu in): [illegible]

WEIGHT (lb): 6.5 TEMP RANGE (deg F): 32,+122

INPUT VOLTAGE: 6.5-48 POWER REQUIREMENT (Watts): 12-15

DISPLAY TYPE: 2_LOP LED 0-9 KEY PAD? N

NUMBER AND TYPE OF DATA KEYS: 5-THUMB,+ 8-PUSHBUT ANTENNA HEIGHT (inches): 96

****ASF CORRECTION TECHNIQUE
NONE

****DYNAMIC RANGE
110dB

****SNR FOR ACQUISITION
-10dB

****SNR FOR TRACK (MIN)
-30dB

****NOISE BANDWIDTH
25kHz AT RECEIVER OUTPUT

****NOTCH FILTERS
8 PRESET

****MICRO-PROCESSOR TYPE(S)
8085

****CERTIFICATIONS
NONE

****SENSITIVITY (u VOLTS)
1uV (ATMOSPHERIC NOISE LIMITED)

****STATIONS TRACKED & HOW USED
ALL SECONDARIES TRACKED, USER DEFINES LOP FOR DISPLAY

****MULTI-CHAIN CAPABILITY
NO

****MAX. GDOP FOR LAT-LONG
N/A

****SNR FOR POSITION DISPLAY
-30dB

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # AVENGER 512 II MORROW INC
2777 19th S.E. POB 13549, SALEM OREGON 97309

PHONE 503-581-8101

LIST PRICE (USD): 1795.00 12/01/82 ADVERTISED PRICE (USD): 1295.00 11/10/83

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 3.75 W(inches): 8.85 D(inches): 11.7 VOLUME(cu.in.): 388

WEIGHT (lb): 6.5 TEMP RANGE (deg F): 32,+122

INPUT VOLTAGE: 6.5-48 POWER REQUIREMENT (Watts): 11

DISPLAY TYPE: 2-LOP LCD 0-9 KEY PAD? N

NUMBER AND TYPE OF DATA KEYS: 9 PUSH BUTTON ANTENNA HEIGHT (inches): 96

****ASF CORRECTION TECHNIQUE
MANUAL ENTRY

****NOTCH FILTERS
8 PRESET

****MICRO-PROCESSOR TYPE(S)
TWO, 8085

****STATIONS TRACKED & HOW USED
ALL SECONDARIES TRACKED, USER DEFINES TRIAD FOR NAVIGATION

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
NONE

****DYNAMIC RANGE
110dB

****MAX. GDOP FOR LAT-LONG
N/A

****NOISE BANDWIDTH
23kHz AT RECEIVER OUTPUT

****SENSITIVITY (u VOLTS)
1uV (ATMOSPHERIC NOISE LIMITED)

****SNR FOR ACQUISITION
-10dB

****SNR FOR TRACK (MIN)
-30dB

****SNR FOR POSITION DISPLAY
-30dB

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # AVENGER 502BR II MORROW INC
2777 19th S.E. POB 13549, SALEM OREGON 97309

PHONE 503-581-8101

LIST PRICE (USD): 1695.00 05/07/83 ADVERTISED PRICE (USD): 1295.00 11/10/83

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

W(inches): 5.75 W(inches): 8.85 D(inches): 11.7 VOLUME(cu.in.): 388

WEIGHT (lb): 6.5 TEMP RANGE (deg F): 32,+122

INPUT VOLTAGE: 6.5-48 POWER REQUIREMENT (Watts): 12-15

DISPLAY TYPE: 2_LOP LED 0-9 KEY PAD? N

NUMBER AND TYPE OF DATA KEYS: 5-THUMB,+ 8-PUSHBUT ANTENNA HEIGHT (inches): 96

****ASF CORRECTION TECHNIQUE
MANUAL ENTRY

****NOTCH FILTERS
8 PRESET

****MICRO-PROCESSOR TYPE(S)
TWO,8085

****STATIONS TRACKED & HOW USED
ALL SECONDARIES TRACKED, USER DEFINES TRIAD FOR NAVIGATION

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
NONE

****DYNAMIC RANGE
110dB

****MAX. GDOP FOR LAT-LONG
N/A

****NOISE BANDWIDTH
25kHz AT RECEIVER OUTPUT

****SENSITIVITY (u VOLTS)
1uV (ATMOSPHERIC NOISE LIMITED)

****SNR FOR ACQUISITION
-10dB

****SNR FOR TRACK (MIN)
-30dB

****SNR FOR POSITION DISPLAY
-30dB

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # LC 300 INTERNATIONAL AVIONICS, INC.
6668 CUMMINGS PARK WORBURN MA 01801

PHONE 617-935-3000

LIST PRICE (USD): 1895.00 05/07/83 ADVERTISED PRICE (USD): 1895.00 10/28/83

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 3.75 W(inches): 12 D(inches): 11 VOLUME(cu.in.): 495

WEIGHT (lb): 10 TEMP RANGE (deg F):

INPUT VOLTAGE: 8-40 POWER REQUIREMENT (Watts): 20

DISPLAY TYPE: 2 LOP LED 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 6 KEY + 8 POS ROTARY ANTENNA HEIGHT (inches): 96

****ASF CORRECTION TECHNIQUE
MANUALLY ENTERED FROM KEYBOARD, DELTA TD OR KNOWN LAT-LONG

****NOTCH FILTERS
FOUR INTERNAL, OPTIONAL EXTERNAL AVAILABLE

****MICRO-PROCESSOR TYPE(S)
TWO 8085

****STATIONS TRACKED & HOW USED
ALL TRACKED, TWO LOP MANUALLY SELECTED

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
DOT CANADA

****DYNAMIC RANGE
95dB

****MAX. GDOP FOR LAT-LONG
NOT CONSTRAINED

****NOISE BANDWIDTH
19kHz 3dB , 40dB, 25kHz

****SENSITIVITY (u VOLTS)
1uV/METER

****SNR FOR ACQUISITION
-10dB

****SNR FOR TRACK (MIN)
-20 dB

****SNR FOR POSITION DISPLAY
-20 dB

*****N1
OPTIONAL ANTISTATIC ANTENNA

*****N2
OPTIONAL SEARCH PATTERNS FOR SAR

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # LC 403 INTERNATIONAL AVIONICS, INC.
6668 CUMMINGS PARK WORBURN MA 01801

PHONE 617-935-3000

LIST PRICE (USD): ADVERTISED PRICE (USD): 2800.00 10/28/83

DESIGNED FOR: MT [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 2PCB W(inches): D(inches): VOLUME(cu.in.):

WEIGHT (lb): TEMP RANGE (deg F): 32,+140

INPUT VOLTAGE: 5 POWER REQUIREMENT (Watts): 8

DISPLAY TYPE: NONE 0-9 KEY PAD? N

NUMBER AND TYPE OF DATA KEYS: NONE RS-232 ONLY ANTENNA HEIGHT (inches): 96

****ASF CORRECTION TECHNIQUE
TD ONLY

****NOTCH FILTERS
TWO PRESET INTERNAL NOTCHES, TWO OPERATOR TUNEABLE NOTCHES OPTIONAL

****MICRO-PROCESSOR TYPE(S)
8085

****STATIONS TRACKED & HOW USED
MASTER AND FOUR SECONDARIES, FOUR LOP PROVIDED

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
RTCM-MPS

****DYNAMIC RANGE
110dB

****MAX. GDOP FOR LAT-LONG
N/A

****NOISE BANDWIDTH
24kHz, 3dB 28kHz, 40dB

****SENSITIVITY (u VOLTS)
10dB ABOVE 1uV/METER

****SNR FOR ACQUISITION
-12dB

****SNR FOR TRACK (MIN)
-20dB

****SNR FOR POSITION DISPLAY
N/A

*****N1
BARE BOARDS - COMM. INTERFACE REMOTELY CONTROLLABLE

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # LC 404 INTERNATIONAL AVIONICS, INC.
6668 CUMMINGS PARK WORBURN MA 01801

PHONE 617-935-3000

LIST PRICE (USD): 10650.00 ADVERTISED PRICE (USD): 7000.00 10/28/83

DESIGNED FOR: MT [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 5.7 W(inches): 12.6 D(inches): 13.2 VOLUME(cu.in.): 948

WEIGHT (lb): 17 TEMP RANGE (deg F): 32,+140

INPUT VOLTAGE: 10-40 POWER REQUIREMENT (Watts): 15

DISPLAY TYPE: 2 LOP LED 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 4 ANTENNA HEIGHT (inches): 96

****ASF CORRECTION TECHNIQUE
NO CORRECTION

****NOTCH FILTERS
TWO PRESET INTERNAL, TWO OPERATOR TUNEABLE OPTIONAL

****MICRO-PROCESSOR TYPE(S)
8085

****STATIONS TRACKED & HOW USED
MASTER PLUS FOUR SECONDARIES, FOUR LOP PROVIDED

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
RTCM-MPS

****DYNAMIC RANGE
110dB

****MAX. GDOP FOR LAT-LONG
N/A

****NOISE BANDWIDTH
28kHZ 40dB

****SENSITIVITY (u VOLTS)
10dB ABOVE 1uV

****SNR FOR ACQUISITION
-15dB

****SNR FOR TRACK (MIN)
-20dB

****SNR FOR POSITION DISPLAY
-20dB

*****NI
HI ACCURACY,10RMS, REMOTELY CONTROLLABLE

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # LC 408 INTERNATIONAL AVIONICS, INC.
6668 CUMMINGS PARK WORBURN MA 01801

PHONE 617-935-3000

LIST PRICE (USD): 05/07/83 ADVERTISED PRICE (USD): 13200.00

DESIGNED FOR: MT [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 5.25 W(inches): 19 D(inches): 17 VOLUME(cu.in.): 1696

WEIGHT (lb): 30 TEMP RANGE (deg F): 32-140

INPUT VOLTAGE: *** POWER REQUIREMENT (Watts): 25

DISPLAY TYPE: 2 LOP LED 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 6, 3 POS ROTARY SW ANTENNA HEIGHT (inches): 96

****ASF CORRECTION TECHNIQUE
N/A

****NOTCH FILTERS
FOUR INTERNAL, PRESET

****MICRO-PROCESSOR TYPE(S)
8085

****STATIONS TRACKED & HOW USED
MSTR & 4 SEC. TRACKED FOR EACH CHAIN.COMPUTATION FROM TWO SELECTED LOP'S.

****MULTI-CHAIN CAPABILITY
TWO CHAINS, SIMULTANEOUS

****CERTIFICATIONS
RTCM MPS

****DYNAMIC RANGE
110dB

****MAX. GDOP FOR LAT-LONG
N/A

****NOISE BANDWIDTH
28 kHz 40dB

****SENSITIVITY (u VOLTS)
10dB ABOVE 1uV/METER

****SNR FOR ACQUISITION
-12dB

****SNR FOR TRACK (MIN)
-20dB

****SNR FOR POSITION DISPLAY
-20dB

*****N1
INPUT VOLTAGE 10-40 V/120VAC

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # LC 360

INTERNATIONAL AVIONICS, INC.
6668 CUMMINGS PARK WORBURN MA 01801

PHONE 617-935-3000

LIST PRICE (USD): 2995.00 05/00/83 ADVERTISED PRICE (USD):

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 5.06 W(inches): 12.4 D(inches): 11 VOLUME(cu.in.): 690

WEIGHT (lb): 10 TEMP RANGE (deg F):

INPUT VOLTAGE: 12 POWER REQUIREMENT (Watts): 30

DISPLAY TYPE: 2 LOP LED 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 6 KEY + 8 POS ROTARY ANTENNA HEIGHT (inches): 96

****ASF CORRECTION TECHNIQUE
MANUALLY ENTERED + KNOWN LAT/LONG

****NOTCH FILTERS
FOUR INTERNAL; OPTIONAL, FOUR EXTERNAL

****MICRO-PROCESSOR TYPE(S)
TWO 8085

****STATIONS TRACKED & HOW USED
ALL TRACKED, TWO LOP MANUALLY SELECTED

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
RTCM-MPS

****DYNAMIC RANGE
105dB

****MAX. GDOP FOR LAT-LONG
NONE

****NOISE BANDWIDTH
19kHz 3dB, 40dB 25kHz

****SENSITIVITY (u VOLTS)
1uV/METER FOR TRACK

****SNR FOR ACQUISITION
-10dB

****SNR FOR TRACK (MIN)
-20dB

****SNR FOR POSITION DISPLAY
-20 dBN

*****M1
WAYPOINTS, 40 TRACK SPEED 40 KTS

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # LC 720 INTERNATIONAL AVIONICS, INC.
6668 CUMMINGS PARK WORBURN MA 01801

PHONE 617-935-3000

LIST PRICE (USD): 3995.00 05/07/83 ADVERTISED PRICE (USD): 3995.00 05/07/83

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 5.06 W(inches): 12.4 D(inches): 11.1 VOLUME(cu.in.): 696

WEIGHT (lb): 15 TEMP RANGE (deg F):

INPUT VOLTAGE: 10-40 POWER REQUIREMENT (Watts): 25

DISPLAY TYPE: 2 LOP LED 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 6, 8 POS ROTARY SW ANTENNA HEIGHT (inches): 96

****ASF CORRECTION TECHNIQUE
MANUALLY ENTERED

****NOTCH FILTERS
EXTERNAL NOTCH FILTERS OPTIONAL

****MICRO-PROCESSOR TYPE(S)
8085

****STATIONS TRACKED & HOW USED
MSTR & 4 SEC.FROM EACH CHAIN. POSITION FROM 2 SELECTED LOPS.

****MULTI-CHAIN CAPABILITY
TWO CHAINS, SIMULTANEOUS

****CERTIFICATIONS
UNKNOWN

****DYNAMIC RANGE
95dB

****MAX. GDOP FOR LAT-LONG
UNKNOWN

****NOISE BANDWIDTH
UNKNOWN

****SENSITIVITY (u VOLTS)
1uV/METER

****SNR FOR ACQUISITION
UNKNOWN

****SNR FOR TRACK (MIN)
-20dB

****SNR FOR POSITION DISPLAY
UNKNOWN

*****N1
SAME AS LC360 BUT 2 CHAIN (4 LOPS ON EACH CHAIN) WITH CROSS-CHAIN CAPABILITY

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # LC 1200 INTERNATIONAL AVIONICS, INC.
6668 CUMMINGS PARK WORBURN MA 01801

PHONE 617-935-3000

LIST PRICE (USD): ADVERTISED PRICE (USD): 14000.00 10/28/83

DESIGNED FOR: A [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 7.85 W(inches): 3.75 D(inches): 12.8 VOLUME(cu.in.): 375

WEIGHT (lb): 5.5 TEMP RANGE (deg F): -67,+122

INPUT VOLTAGE: 8-40 POWER REQUIREMENT (Watts): 25

DISPLAY TYPE: ALPHA-NUMERIC VAC. FLRSCN 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 16+FNCTNS, ROTARY SW ANTENNA HEIGHT (inches): 6.25

*****N1
DISPLAY UNIT 4.5(H), 6.75(W), 6.375(D). WEIGHT 3.3 LBS., ANTENNA 1.6 LBS

****ASF CORRECTION TECHNIQUE
MANUALLY ENTERED FROM KEYBOARD, DELTA TD OR KNOWN LAT-LONG

****NOTCH FILTERS
2 PRESET 2 AUTOMATIC

****MICRO-PROCESSOR TYPE(S)
TWO 8085

****STATIONS TRACKED & HOW USED
MASTER AND 4 SECONDARIES ON EACH SELECTED CHAIN. MASTER AND SECONDARY FOR SELECTED LOP MUST BE IN SAME CHAIN. TWO MANUAL

****MULTI-CHAIN CAPABILITY
TWO CHAINS, SIMULTANEOUS

****CERTIFICATIONS
WILL APPLY FOR TSO

****DYNAMIC RANGE
95dB

****MAX. GDOP FOR LAT-LONG
NO WARNING

****NOISE BANDWIDTH
19kHz 3dB 40dB 25kHz

****SENSITIVITY (u VOLTS)
1uV/METER

****SNR FOR ACQUISITION
-10dBWN

****SNR FOR TRACK (MIN)
-20dB

****SNR FOR POSITION DISPLAY
-20dB

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # COMBI LORAN 860 INTERNATIONAL MARINE INSTRUMS
40 SIGNAL RD. STAMFORD CN 06902

PHONE 203-357-8455

LIST PRICE (USD): 2495.00 ADVERTISED PRICE (USD): 1996.10 05/07/83

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 3.62 W(inches): 9.12 D(inches): 11 VOLUME(cu.in.): 363

WEIGHT (lb): 6 TEMP RANGE (deg F): 32+131

INPUT VOLTAGE: 11-45 POWER REQUIREMENT (Watts): 10

DISPLAY TYPE: 2-LOP LCD 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 15 +10 SEC FUN ANTENNA HEIGHT (inches): 6.25

****ASF CORRECTION TECHNIQUE
MANUALLY ENTERED

****NOTCH FILTERS
FOUR, FULLY-AUTOMATIC COMPUTER TUNED PLUS TWO OPTIONAL PRESET NOTCHES

****MICRO-PROCESSOR TYPE(S)
UNKNOWN

****STATIONS TRACKED & HOW USED

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
PART 2 RTCM MINIMUM PERFORMANCE SPECIFICATION

****DYNAMIC RANGE
110dB

****MAX. GDOP FOR LAT-LONG
UNKNOWN

****NOISE BANDWIDTH
WIDE

****SENSITIVITY (u VOLTS)
1uV

****SNR FOR ACQUISITION
LESS THAN 2 MINUTES AT 0dB

****SNR FOR TRACK (MIN)
-20dB

****SNR FOR POSITION DISPLAY
UNKNOWN

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # KING 8001 KING MARINE RADIO CORP
5320 140 AVE N CLEARWATER, FL 33520

PHONE 813-530-3411

LIST PRICE (USD): ADVERTISED PRICE (USD): 12/00/83

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 3.5 W(inches): 6.5 D(inches): 4.5 VOLUME(cu.in.): 102.4

WEIGHT (lb): 1.5 TEMP RANGE (deg F): 32-158

INPUT VOLTAGE: 11-40 POWER REQUIREMENT (Watts): 10

DISPLAY TYPE: LCD, 4 LINES, 7 DIG 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 25 KEY MEMBRANE ANTENNA HEIGHT (inches):

****ASF CORRECTION TECHNIQUE
AREA TABLE OR MANUALLY ENTERED, USA COAST, NORTHERN PACIFIC, JAPAN, MEDITER.,ALASKA

****STATIONS TRACKED & HOW USED
MASTER + 4 SECONDARIES, MASTER INDEPENDENCE

****NOTCH FILTERS
2 FIXED, 4 AUTOMATIC

****MICRO-PROCESSOR TYPE(S)
8085

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
RTCM MPS, CANADIAN DOT, FCC

****DYNAMIC RANGE
100 dB

****MAX. GDOP FOR LAT-LONG
NOT LIMITED

****NOISE BANDWIDTH
26 kHz, 3dB

****SENSITIVITY (u VOLTS)
5 uVOLTS

****SNR FOR ACQUISITION
-10 dB

****SNR FOR POSITION DISPLAY
-15 dB

****SNR FOR TRACK (MIN)
-15 dB

*****N1
TO BE INTRODUCED SPRING OF 1984, WILL INCLUDE SAUDI CHAIN

*****N2
MANUFACTURER CLAIMS EASE OF OPERATION IS A MAJOR FEATURE

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # ACCUFIX 500 MEGAPULSE, INC.
8 PRESTON COURT : BEDFORD, MA 01730

PHONE 617-275-2010

LIST PRICE (USD): 12/00/82 ADVERTISED PRICE (USD):

DESIGNED FOR: SM [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 5.7 W(inches): 12.6 D(inches): 13.2 VOLUME(cu.in.): 948

WEIGHT (lb): 17 TEMP RANGE (deg F): 32,+140

INPUT VOLTAGE: 10-40 POWER REQUIREMENT (Watts): 20

DISPLAY TYPE: 2LOP, LED 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 6 + EXPNDBL SEC FNCT ANTENNA HEIGHT (inches): 96

****ASF CORRECTION TECHNIQUE
NONE

****NOTCH FILTERS
2 INTERNAL, PLUS OPTIONAL EXTERNAL NOTCHES AS REQUIRED FOR PARTICULAR APPLICATION

****MICRO-PROCESSOR TYPE(S)
8085

****STATIONS TRACKED & HOW USED
MASTER PLUS 4 SECONDARIES, 2LOP DISPLAYED, ALL AVAILABLE FROM REMOTE DATA PORT

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
RTCM-MPS

****DYNAMIC RANGE
114dB

****MAX. GDOP FOR LAT-LONG
N/A

****NOISE BANDWIDTH
23kHz

****SENSITIVITY (u VOLTS)
3uV

****SNR FOR ACQUISITION
-15dB ATMOSPHERIC

****SNR FOR TRACK (MIN)
-23dB ATMOSPHERIC

****SNR FOR POSITION DISPLAY
LOSS OF SIGNAL WARNING AT -20dB ATMOSPHERIC

*****N1
ALL DATA OUTPUT THRU RS-232 PORT. FULL DUPLEX CONTROL/MONITORING THRU SECOND RS-232 PORT.

*****N2
UNIT WILL ACCEPT AND APPLY DIFFERENTIAL CORRECTIONS TO ALL TD OUTPUTS.

*****N3
RECEIVER ERROR SPECIFIED LESS THAN 25 NSEC OVER A WIDE RANGE OF OPERATING CONDITIONS.

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # ML-5000 PORTABLE MICROLOGIC
20801 DEARBORN,CHATSWORTH,CA. 91311

PHONE 213-998-1216

LIST PRICE (USD): 1895.00 01/01/83 ADVERTISED PRICE (USD): 1860.00 05/07/83

DESIGNED FOR: MA [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 8.8 W(inches): 10 D(inches): 4 VOLUME(cu.in.): 352

WEIGHT (lb): 9.46 TEMP RANGE (deg F): 23,+131

INPUT VOLTAGE: 10-18 POWER REQUIREMENT (Watts): 7-11

DISPLAY TYPE: 2-LOP LCD 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 10 +14 SEC FUN ANTENNA HEIGHT (inches): 52

****ASF CORRECTION TECHNIQUE
STORED CORRECTION POINTS, LINEAR INTERPOLATION

****NOTCH FILTERS
6 FIXED

****MICRO-PROCESSOR TYPE(S)
INTEL 8085

****STATIONS TRACKED & HOW USED
MASTER LUS 5 SECONDARIES, 2 SECONDARIES FOR LAT-LONG, STRONGEST SECONDARY,
ALSO AUTO SELECTION OF NEW GRI

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
MEETS RTCM CRITERIA

****DYNAMIC RANGE
90dB

****MAX. GDOP FOR LAT-LONG
NO MAX, COMPUTERIZED MODEL

****NOISE BANDWIDTH
20kHz

****SENSITIVITY (u VOLTS)
1 uV/METER

****SNR FOR ACQUISITION
-18dB

****SNR FOR TRACK (MIN)
-20dB

****SNR FOR POSITION DISPLAY
-18dB FOR WARNING

*****N1
5000 IS MARINE, 5000A IS AIRCRAFT, $2595 2 COUPLERS, $1695 2 OTHER COUPLERS.

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # ML-220 MICROLOGIC
20801 DEARBORN,CHATSWORTH,CA. 91311

PHONE 213-998-1216

LIST PRICE (USD): 2495.00 00/00/79 ADVERTISED PRICE (USD): 2495.00 02/15/82

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 5.5 W(inches): 12 D(inches): 11.5 VOLUME(cu.in.): 759

WEIGHT (lb): 11.5 TEMP RANGE (deg F): 25,+131

INPUT VOLTAGE: 10-18 POWER REQUIREMENT (Watts): 14

DISPLAY TYPE: 2-LOP LED 0-9 KEY PAD? N

NUMBER AND TYPE OF DATA KEYS: 3 SW, 5-10 POSITIONS ANTENNA HEIGHT (inches): 52

****ASF CORRECTION TECHNIQUE
NONE

****NOTCH FILTERS
2 MANUAL, 5 FIXED (2 IN ANTENNA COUPLER)

****MICRO-PROCESSOR TYPE(S)
INTEL 8085

****STATIONS TRACKED & HOW USED
MASTER PLUS 5 SECONDARIES, TD DISPLAY, DIRECT RANGE TO MASTER

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
CANADIAN MOT/DOC

****DYNAMIC RANGE
90dB

****MAX. GDOP FOR LAT-LONG
NO

****NOISE BANDWIDTH
22kHz

****SENSITIVITY (u VOLTS)
1uV/METER

****SNR FOR ACQUISITION
-18dB

****SNR FOR TRACK (MIN)
-20dB

****SNR FOR POSITION DISPLAY
N/A

*****N1
NOT CURRENTLY IN PRODUCTION

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # ML-320 *MICROLOGIC*
20801 DEARBORN,CHATSWORTH,CA. 91311

PHONE 213-998-1216

LIST PRICE (USD): 3395.00 00/00/00 ADVERTISED PRICE (USD): 3995.00 11/00/83

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): W(inches): D(inches): VOLUME(cu.in.): 759

WEIGHT (lb): 9 TEMP RANGE (deg F): 23,+131

INPUT VOLTAGE: 10-18 POWER REQUIREMENT (Watts): 18

DISPLAY TYPE: 2 LOP LED, LAT-LONG 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 1-10 PUSH BUTTON ANTENNA HEIGHT (inches): 52

****ASF CORRECTION TECHNIQUE
NO MANUAL CALIBRATION

****NOTCH FILTERS
3 INTERNAL, 2 COUPLER, 2 MANUAL

****MICRO-PROCESSOR TYPE(S)
INTEL 8085

****STATIONS TRACKED & HOW USED
MASTER PLUS 5 SECONDARY, 2 SECONDARIES FOR LAT-LONG, 1 GRI

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
CANADIAN MOT/RTCM

****DYNAMIC RANGE
90dB

****MAX. GDOP FOR LAT-LONG
NO MAX

****NOISE BANDWIDTH
22kHz

****SENSITIVITY (u VOLTS)
1uV/METER

****SNR FOR ACQUISITION
-18dB

****SNR FOR TRACK (MIN)
-20dB

****SNR FOR POSITION DISPLAY
-18dB FOR WARNING

*****N1
WAYPOINTS, 10

*****N2
RS232 OUTPUT TO COMPUTER/PRINTER, USER SELECTED THROUGH KEYBOARD,
SELECT BAUD LEVELS 300-9600

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # ML-3000 MICROLOGIC
20801 DEARBORN,CHATSWORTH,CA. 91311

PHONE 213-998-1216

LIST PRICE (USD): 1995.00 02/15/82 ADVERTISED PRICE (USD): 1695.00 05/07/83

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 5.2 W(inches): 9.7 D(inches): 11.4 VOLUME(cu.in.): 575

WEIGHT (lb): 9 TEMP RANGE (deg F): 23,+131

INPUT VOLTAGE: 10-18 POWER REQUIREMENT (Watts): 20

DISPLAY TYPE: 2-LOP LCD 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 10 +14 SEC FUN ANTENNA HEIGHT (inches): 52

****ASF CORRECTION TECHNIQUE
STORED CORRECTION POINTS, LINEAR INTERPOLATION

****NOTCH FILTERS
6 FIXED, 2 MANUAL, 2 IN COUPLER

****MICRO-PROCESSOR TYPE(S)
INTEL 8085

****STATIONS TRACKED & HOW USED
MASTER PLUS 5 SECONDARIES, 2 SECONDARIES FOR LAT-LONG, SINGLE GRI,
ALL SECONDARIES, AUTO CHANGE GRI, IAW LOCATION

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
CANADIAN MOT/RTCM

****DYNAMIC RANGE
96dB

****MAX. GDOP FOR LAT-LONG
NO MAX, BASELINE EXTENSION 20uSEC

****NOISE BANDWIDTH
UNKNOWN

****SENSITIVITY (u VOLTS)
1 uV/METER

****SNR FOR ACQUISITION
-18dB

****SNR FOR TRACK (MIN)
-20dB

****SNR FOR POSITION DISPLAY
-18dB FOR WARNING

*****NI
ACCESSORIES+ EXTERNAL ALARM (INTEGRAL), AUTOPILOT INTERFACE, PLOTTER,
FULL FUNCTION REMOTE UNIT

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # ML-4000 MICROLOGIC
20801 DEARBORN,CHATSWORTH,CA. 91311

PHONE 213-998-1216

LIST PRICE (USD): ADVERTISED PRICE (USD): 3495.00 05/07/83

DESIGNED FOR: A [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 3 W(inches): 6.25 D(inches): 12 VOLUME(cu.in.): 225

WEIGHT (lb): 5 TEMP RANGE (deg F): 5,+131

INPUT VOLTAGE: 10-16 POWER REQUIREMENT (Watts): 25

DISPLAY TYPE: 1-LOP INCANDESCENT 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 10 + 10 SEC FUN ANTENNA HEIGHT (inches): 19

****ASF CORRECTION TECHNIQUE
LAND/SEA

****STATIONS TRACKED & HOW USED
TRACKS ALL MASTER DEPENDENT, AUTO GRI, AUTO SEC, TRACKS 5 SECONDARIES, OPERATOR SELECTED

****SNR FOR ACQUISITION
-18dB SIMULATOR

****SNR FOR TRACK (MIN)
-24dB USCG DEFINITION

****MAX. GDOP FOR LAT-LONG
NO SOLUTION WITHIN 20uSEC OF EXTENDED BASE LINE

****NOTCH FILTERS
6 FIXED

****MICRO-PROCESSOR TYPE(S)
INTEL 8085

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
FAA IN PROGRESS

****DYNAMIC RANGE
96dB

****NOISE BANDWIDTH
20kHz

****SENSITIVITY (u VOLTS)
1 uV/METER

****SNR FOR POSITION DISPLAY
-16dB FOR WARNING

*****N1
INTERFACE WITH CDI

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # ML-2000N MICROLOGIC
20801 DEARBORN,CHATSWORTH,CA. 91311

PHONE 213-998-1216

LIST PRICE (USD): 1795.00 02/15/82 ADVERTISED PRICE (USD): 1395.00 11/00/83

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 3.5 W(inches): 8.8- D(inches): 12 VOLUME(cu.in.): 369

WEIGHT (lb): 7 TEMP RANGE (deg F): 23,+131

INPUT VOLTAGE: 10-18 POWER REQUIREMENT (Watts): 9

DISPLAY TYPE: 1-LOP LCD 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 9 +14 SEC FUN ANTENNA HEIGHT (inches): 60

****ASF CORRECTION TECHNIQUE
YES, MANUAL CALIBRATION

****NOTCH FILTERS
6 FIXED, 4 INTERNAL AND 2 IN COUPLER

****MICRO-PROCESSOR TYPE(S)
INTEL 8085

****STATIONS TRACKED & HOW USED
ALL TRACKED, 2 SECONDARIES FOR LAT-LONG, SINGLE GRI, ALL SECONDARIES AVAILABLE, 2 TRACKED

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
CANADIAN MOT

****DYNAMIC RANGE
90dB

****MAX. GDOP FOR LAT-LONG
NO MAX

****NOISE BANDWIDTH
20kHz

****SENSITIVITY (u VOLTS)
10

****SNR FOR ACQUISITION
-18dB

****SNR FOR TRACK (MIN)
-20dB

****SNR FOR POSITION DISPLAY
-18dB FOR WARNING

*****N1
ACCESSORY ML-20 EXTERNAL NOTCHES (2)

*****N2
N-FULL NAVIGATOR, SYSTEM NOT CURRENTLY IN PRODUCTION

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # ML-2000R MICROLOGIC
20801 DEARBORN,CHATSWORTH,CA. 91311

PHONE 213-998-1216

LIST PRICE (USD): 1295.00 02/15/82 ADVERTISED PRICE (USD): 1036.00 05/07/83

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 3.5 W(inches): 8.8- D(inches): 12 VOLUME(cu.in.): 369

WEIGHT (lb): 7 TEMP RANGE (deg F): 23,+131

INPUT VOLTAGE: 10-18 POWER REQUIREMENT (Watts): 9

DISPLAY TYPE: 1-LOP LCD 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 9 +14 SEC FUN ANTENNA HEIGHT (inches): 52

****ASF CORRECTION TECHNIQUE
NONE

****NOTCH FILTERS
6 FIXED

****MICRO-PROCESSOR TYPE(S)
INTEL 8085

****STATIONS TRACKED & HOW USED
ALL, TD DISPLAY, 1 GRI, ALL SECONDARIES

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
CANADIAN NOT

****DYNAMIC RANGE
90dB

****MAX. GDOP FOR LAT-LONG
N/A

****NOISE BANDWIDTH
20 kHz

****SENSITIVITY (u VOLTS)
10

****SNR FOR ACQUISITION
-18dB

****SNR FOR TRACK (MIN)
-20dB

****SNR FOR POSITION DISPLAY
-18dB FOR WARNING

*****N1
RECEIVER VERSION OF 2000N, NOT FULL FUNCTION NAVIGATOR, TD ONLY, HARDWARE GRI, NO WAYPOINTS

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # ML-4100 MICROLOGIC
20801 DEARBORN,CHATSWORTH,CA. 91311

PHONE 213-998-1216

LIST PRICE (USD): ADVERTISED PRICE (USD): 4495.00 05/07/83

DESIGNED FOR: A [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 6.7 W(inches): 3.7 D(inches): 11.9 VOLUME(cu.in.): 359

WEIGHT (lb): 4.5 TEMP RANGE (deg F): 5,+131

INPUT VOLTAGE: 10-16 POWER REQUIREMENT (Watts): 25

DISPLAY TYPE: 1-LOP INCANDESCENT 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 10 + 10 SEC FUN ANTENNA HEIGHT (inches): 19

****ASF CORRECTION TECHNIQUE
PROB. SEA WATER, BUT YES AND MANUALLY CAL.

****STATIONS TRACKED & HOW USED
TRACKS ALL MASTER DEPENDENT

****SNR ACQU
-18 DB SIMULATOR

****SNR FOR TRACK (MIN)
-24 DB USCG DEFINITION

****MAX. GDOP FOR LAT-LONG
NO SOLUTION WITHIN 20 USEC OF EXTENDED BASE LINE

****NOTCH FILTERS
6 FIXED, INTERNAL

****MICRO-PROCESSOR TYPE(S)
INTEL 8085

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
FAA IN PROGRESS

****DYNAMIC RANGE
96dB

****NOISE BANDWIDTH
20kHz

****SENSITIVITY (u VOLTS)
1 uV/METER

****SNR FOR POSITION DISPLAY
-16dB FOR WARNING

*****N1
SEPARATE CONTROL DISPLAY UNIT 5.8X3.8X2.9 (WHD), 1 POUND 5 OUNCES

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # ML-5000 BASIC MICROLOGIC
20801 DEARBORN,CHATSWORTH,CA. 91311

PHONE 213-998-1216

LIST PRICE (USD): 1495.00 01/01/83 ADVERTISED PRICE (USD): 1098.00 11/00/83

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 5.6 W(inches): 10 D(inches): 4 VOLUME(cu.in.): 224

WEIGHT (lb): 7.04 TEMP RANGE (deg F): 23,+131

INPUT VOLTAGE: 10-18 POWER REQUIREMENT (Watts): 7-11

DISPLAY TYPE: 2-LOP LCD 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 10 +14 SEC FUN ANTENNA HEIGHT (inches): 4

****ASF CORRECTION TECHNIQUE
MAP OF NORTH AMERICAN COASTLINE LINEAR INTERPOLATION

****NOISE BANDWIDTH
24 KHZ

****STATIONS TRACKED & HOW USED
TRACKS ALL 3 STATION SOLUTION

****NOTCH FILTERS
6 FIXED

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
NONE

****DYNAMIC RANGE
90dB

****MAX. GDOP FOR LAT-LONG
NO MAX

****SENSITIVITY (u VOLTS)
10

****SNR FOR ACQUISITION
-18dB

****SNR FOR TRACK (MIN)
-20dB

****SNR FOR POSITION DISPLAY
-18dB FOR WARNING

****MICRO-PROCESSOR TYPE(S)
INTEL 8085

*****N1
ML-5000A HAS TIME CONSTANTS ADJUSTED FOR A/C USE - $1,595. WITH P/A &250 kt. ANT $1,695

*****N2
WAYPOINTS, 59 TRACKING SPEED, 200KTS

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # C-MASTER X MIECO, div of LSA SCIENTIFIC
109 BEAVER CT. COCKEYSVILLE MD 21030

PHONE 301 667-4660

LIST PRICE (USD): 2595.00 09/00/83 ADVERTISED PRICE (USD): 2595.00 09/00/83

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 3.7 W(inches): 9.1 D(inches): 11 VOLUME(cu.in.): 370

WEIGHT (lb): 6 TEMP RANGE (deg F): 32,+122

INPUT VOLTAGE: 10-45 POWER REQUIREMENT (Watts): 15

DISPLAY TYPE: 2-LOP LCD 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 11 + 10 SEC. ON 0-9 ANTENNA HEIGHT (inches): 96

****ASF CORRECTION TECHNIQUE
MANUAL ENTRY OF DELTA TD OR LAT-LONG

****NOTCH FILTERS
4 AUTOMATIC

****MICRO-PROCESSOR TYPE(S)
TWO, 6502

****STATIONS TRACKED & HOW USED
MASTER AND ALL SECONDARIES, ALL USABLE SIGNALS COMBINED IN WEIGHTED SOLUTION

****MULTI-CHAIN CAPABILITY
AUTOMATIC HANDOFF TO BEST CHAIN FOR OPERATING AREA

****CERTIFICATIONS
RTCM-MPS PART2

****DYNAMIC RANGE
110dB

****NOISE BANDWIDTH
UNKNOWN

****SENSITIVITY (u VOLTS)
1uV

****SNR FOR ACQUISITION
UNKNOWN

****SNR FOR TRACK (MIN)
UNKNOWN

****SNR FOR POSITION DISPLAY
UNKNOWN

****MAX. GDOP FOR LAT-LONG
UNKNOWN

*****N1
REMOTE CONTROL UNIT 5x10.5x4.5 (HWD) WEIGHT 5.5 lbs.ONE REQUIRED FOR COMPLETE RECEIVER.

*****N2
RS232 COMMUNICATIONS BETWEEN RECEIVER CPU AND REMOTE CONTROL UNIT.

LORAN-C RECEIVER MANUFACTURERS DATE 04/10/84

MODEL # C-MASTER IV MICO, div of LSA SCIENTIFIC
109 BEAVER CT. COCKEYSVILLE MD 21030

PHONE 301 667-4660

LIST PRICE (USD): 1695.00 11/01/82 ADVERTISED PRICE (USD): 1295.00 05/07/83

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 5.5 W(inches): 9.12 D(inches): 11 VOLUME(cu.in.): 363

WEIGHT (lb): 6 TEMP RANGE (deg F): 32,+122

INPUT VOLTAGE: 11-45 POWER REQUIREMENT (Watts): 10

DISPLAY TYPE: 2_LOP LCD 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 11 + 10 SEC. ON 0-9 ANTENNA HEIGHT (inches):

****ASF CORRECTION TECHNIQUE
MANUALLY ENTERED DELTA TD

****NOTCH FILTERS
4 AUTOMATIC

****MICRO-PROCESSOR TYPE(S)
6502

****STATIONS TRACKED & HOW USED
ALL TRACKED, 2 SELECTED FOR TD

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
RTCM-MPS

****MAX. GDOP FOR LAT-LONG
UNKNOWN

****SENSITIVITY (u VOLTS)
1uV

****SNR FOR ACQUISITION
-10dB

****SNR FOR TRACK (MIN)
UNKNOWN

****SNR FOR POSITION DISPLAY
BLINKS AT PRESET SNR (UNKNOWN VALUE)

****DYNAMIC RANGE
110dB

****NOISE BANDWIDTH
WIDE

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # C-MASTER V MIECO, div of LSA SCIENTIFIC
109 BEAVER CT. COCKEYSVILLE MD 21030

PHONE 301 667-4660

LIST PRICE (USD): ADVERTISED PRICE (USD):

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): W(inches): D(inches): VOLUME(cu.in.):

WEIGHT (lb): TEMP RANGE (deg F):

INPUT VOLTAGE: POWER REQUIREMENT (Watts):

DISPLAY TYPE: 0-9 KEY PAD?

NUMBER AND TYPE OF DATA KEYS: ANTENNA HEIGHT (inches):

****ASF CORRECTION TECHNIQUE
UNKNOWN

****NOTCH FILTERS
UNKNOWN

****MICRO-PROCESSOR TYPE(S)
UNKNOWN

****STATIONS TRACKED & HOW USED
UNKNOWN

****MULTI-CHAIN CAPABILITY
UNKNOWN

****CERTIFICATIONS
UNKNOWN

****DYNAMIC RANGE
UNKNOWN

****MAX. GDOP FOR LAT-LONG
UNKNOWN

****NOISE BANDWIDTH
UNKNOWN

****SNR FOR ACQUISITION

****SNR FOR TRACK (MIN)
UNKNOWN

****SNR FOR POSITION DISPLAY
UNKNOWN

****SENSITIVITY (u VOLTS)
UNKNOWN

*****N1

*****N2

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # C-MASTER IV L/L MIECO, div of LSA SCIENTIFIC
109 BEAVER CT. COCKEYSVILLE MD 21030

PHONE 301 667-4660

LIST PRICE (USD): 2095.00 11/01/82 ADVERTISED PRICE (USD): 1539.00 05/07/83

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 3.62 W(inches): 9.12 D(inches): 11 VOLUME(cu.in.): 363

WEIGHT (lb): 6 TEMP RANGE (deg F): 32,+122

INPUT VOLTAGE: 11-45 POWER REQUIREMENT (Watts): 10

DISPLAY TYPE: 2_LOP LCD 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 11 + 10 SEC. ON 0-9 ANTENNA HEIGHT (inches):

****ASF CORRECTION TECHNIQUE
MANUALLY ENTERED, DELTA TD OR LAT-LONG

****NOTCH FILTERS
4 AUTOMATIC

****MICRO-PROCESSOR TYPE(S)
6502

****STATIONS TRACKED & HOW USED
ALL STATIONS TRACKED, 2 LOP USED FOR LAT-LONG

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
RTCM-MPS

****DYNAMIC RANGE
110dB

****NOISE BANDWIDTH
WIDE

****SENSITIVITY (u VOLTS)
1uV

****SNR FOR ACQUISITION
-10dB

****SNR FOR TRACK (MIN)
UNKNOWN

****SNR FOR POSITION DISPLAY
UNKNOWN

****MAX. GDOP FOR LAT-LONG
UNKNOWN

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # MAVL-1 MOTOROLA,INC.
1301 E. ALGONQUIN RD. SCHAUMBURG, IL, 60196

PHONE 312-576-5955

LIST PRICE (USD): ADVERTISED PRICE (USD):

DESIGNED FOR: L [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): W(inches): D(inches): VOLUME(cu.in.): 280

WEIGHT (lb): TEMP RANGE (deg F): -40,+185

INPUT VOLTAGE: 6-15 POWER REQUIREMENT (Watts): 12

DISPLAY TYPE: 600 BAUD DPSK MODEM 0-9 KEY PAD? N

NUMBER AND TYPE OF DATA KEYS: NONE ANTENNA HEIGHT (inches): 18

****ASF CORRECTION TECHNIQUE

****NOTCH FILTERS

****MICRO-PROCESSOR TYPE(S)

****STATIONS TRACKED & HOW USED

****MULTI-CHAIN CAPABILITY

****CERTIFICATIONS

****DYNAMIC RANGE

****MAX. GDOP FOR LAT-LONG

****NOISE BANDWIDTH

****SENSITIVITY (u VOLTS)

****SNR FOR ACQUISITION

****SNR FOR TRACK (MIN)

****SNR FOR POSITION DISPLAY

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # AUTOFIX 911 NAUTICAL ELECTRONICS CO.,INC.
7095 MILFORD INDUSTRIAL RD.,BALTIMORE,MD 20218

PHONE 301-484-3284

LIST PRICE (USD): 1995.00 ADVERTISED PRICE (USD): 1775.00 05/07/83

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 4.2 W(inches): 10.1 D(inches): 11 VOLUME(cu.in.): 466

WEIGHT (lb): TEMP RANGE (deg F): 10,+122

INPUT VOLTAGE: 10.5-50 POWER REQUIREMENT (Watts): 7.5

DISPLAY TYPE: 2-LOP 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 15 + SEC ON 9 ANTENNA HEIGHT (inches): 80

****ASF CORRECTION TECHNIQUE
6 USER ENTERED CALIBRATION POINTS

****NOTCH FILTERS
2 PRESET, 2 OPERATOR CONTROLLED

****MICRO-PROCESSOR TYPE(S)
UNKNOWN

****STATIONS TRACKED & HOW USED
MASTER PLUS 5 SECONDARIES. LAT-LONG COMPUTED FROM TWO SELECTED TD

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
USCG NPS-TYPE 1

****DYNAMIC RANGE
UNKNOWN

****MAX. GDOP FOR LAT-LONG
UNKNOWN

****NOISE BANDWIDTH
24kHz, 3dB

****SENSITIVITY (u VOLTS)
2uV

****SNR FOR ACQUISITION
-10dB

****SNR FOR TRACK (MIN)
UNKNOWN

****SNR FOR POSITION DISPLAY
UNKNOWN

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # AUTOFIX 921 NAUTICAL ELECTRONICS CO.,INC.
7095 MILFORD INDUSTRIAL RD.,BALTIMORE,MD 20218

PHONE 301-484-3284

LIST PRICE (USD): ADVERTISED PRICE (USD): 2595.00 05/07/83

DESIGNED FOR: A [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 4.2 W(inches): 10.1 D(inches): 11 VOLUME(cu.in.): 466

WEIGHT (lb): TEMP RANGE (deg F): 10,+122

INPUT VOLTAGE: 10.5-50 POWER REQUIREMENT (Watts): 7.5

DISPLAY TYPE: 2-LOP 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 15 + SEC ON 9 ANTENNA HEIGHT (inches):

****ASF CORRECTION TECHNIQUE
UNKNOWN

****NOTCH FILTERS
UNKNOWN

****MICRO-PROCESSOR TYPE(S)
UNKNOWN

****STATIONS TRACKED & HOW USED
UNKNOWN

****MULTI-CHAIN CAPABILITY
UNKNOWN

****CERTIFICATIONS
UNKNOWN

****DYNAMIC RANGE
UNKNOWN

****MAX. GDOP FOR LAT-LONG
UNKNOWN

****NOISE BANDWIDTH
UNKNOWN

****SENSITIVITY (u VOLTS)
UNKNOWN

****SNR FOR ACQUISITION
UNKNOWN

****SNR FOR TRACK (MIN)
UNKNOWN

****SNR FOR POSITION DISPLAY
UNKNOWN

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # AUTOFIX 911-A NAUTICAL ELECTRONICS CO.,INC.
7095 MILFORD INDUSTRIAL RD.,BALTIMORE,MD 20218

PHONE 301-484-3284

LIST PRICE (USD): 1995.00 ADVERTISED PRICE (USD): 1995.00 05/07/83

DESIGNED FOR: A [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 4.2 W(inches): 10.1 D(inches): 11 VOLUME(cu.in.): 466

WEIGHT (lb): TEMP RANGE (deg F): 10,+122

INPUT VOLTAGE: 10.5-50 POWER REQUIREMENT (Watts): 7.5

DISPLAY TYPE: 2-LOP 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 15 + SEC ON 9 ANTENNA HEIGHT (inches): 80

****ASF CORRECTION TECHNIQUE
6 USER ENTERED CALIBRATION POINTS

****NOTCH FILTERS
2 AUTOMATIC, 2 MANUAL

****MICRO-PROCESSOR TYPE(S)
UNKNOWN

****STATIONS TRACKED & HOW USED
MASTER PLUS 5 SECONDARIES. 2 LOP OPERATOR SELECTED FOR LAT-LONG

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
UNKNOWN

****DYNAMIC RANGE
UNKNOWN

****MAX. GDOP FOR LAT-LONG
UNKNOWN

****NOISE BANDWIDTH
24kHz, 3dB

****SENSITIVITY (u VOLTS)
2uV

****SNR FOR ACQUISITION
-10dB

****SNR FOR TRACK (MIN)
UNKNOWN

****SNR FOR POSITION DISPLAY
UNKNOWN

*****N1
THE 911A HAS BEEN MODIFIED FOR VFR AIRCRAFT OPERATION.

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL-# AUTOFIX 911 NAUTICAL ELECTRONICS CO.,INC.
7095 MILFORD INDUSTRIAL RD.,BALTIMORE,MD 20218

PHONE 301-484-3284

LIST PRICE (USD): 1995.00 ADVERTISED PRICE (USD): 1775.00 05/07/83

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 4.2 W(inches): 10.1 D(inches): 11 VOLUME(cu.in.): 466

WEIGHT (lb): TEMP RANGE (deg F): 10,+122

INPUT VOLTAGE: 10.5-50 POWER REQUIREMENT (Watts): 7.5

DISPLAY TYPE: 2-LOP 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 15 + SEC ON 9 ANTENNA HEIGHT (inches): 80

****ASF CORRECTION TECHNIQUE
6 USER ENTERED CALIBRATION POINTS

****NOTCH FILTERS
2 PRESET, 2 OPERATOR CONTROLLED

****MICRO-PROCESSOR TYPE(S)
UNKNOWN

****STATIONS TRACKED & HOW USED
MASTER PLUS 5 SECONDARIES. LAT-LONG COMPUTED FROM TWO SELECTED TD

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
USCG MPS-TYPE 1

****DYNAMIC RANGE
UNKNOWN

****MAX. GDOP FOR LAT-LONG
UNKNOWN

****NOISE BANDWIDTH
24kHz, 3dB

****SENSITIVITY (u VOLTS)
2uV

****SNR FOR ACQUISITION
-10dB

****SNR FOR TRACK (MIN)
UNKNOWN

****SNR FOR POSITION DISPLAY
UNKNOWN

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # ESZ-7000/N NAVIDYNE CORPORATION
11824 FISHING POINT DR, NEWPORT NEWS, VA, 23606

PHONE 804-874-4488

LIST PRICE (USD): ADVERTISED PRICE (USD): 2950.00 10/08/82

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 11.9 W(inches): 16.9 D(inches): 16.3 VOLUME(cu.in.): 3217

WEIGHT (lb): 32 TEMP RANGE (deg F): 32,+122

INPUT VOLTAGE: 10-40 POWER REQUIREMENT (Watts): 60

DISPLAY TYPE: CRT 13 LINES x 32 CHAR 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 13 2 WITH SEC. FUN ANTENNA HEIGHT (inches): 102

****ASF CORRECTION TECHNIQUE
UNKNOWN

****NOTCH FILTERS
2 INTERNAL FACTORY PRESET, 2 ADJUSTABLE

****MICRO-PROCESSOR TYPE(S)
Z-80

****STATIONS TRACKED & HOW USED
ALL AVAILABLE STATIONS ARE USED FOR POSITION COMPUTATION

****MULTI-CHAIN CAPABILITY
UNKNOWN

****CERTIFICATIONS
UNKNOWN

****DYNAMIC RANGE
GREATER THAN 110dB

****MAX. GDOP FOR LAT-LONG
UNKNOWN

****NOISE BANDWIDTH
UNKNOWN

****SENSITIVITY (u VOLTS)
LESS THAN 1uV

****SNR FOR ACQUISITION
-20dB

****SNR FOR TRACK (MIN)
-20dB

****SNR FOR POSITION DISPLAY
-20dB

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # RSZ-7000 NAVIDYNE CORPORATION
11824 FISHING POINT DR, NEWPORT NEWS, VA, 23606

PHONE 804-874-4488

LIST PRICE (USD): ADVERTISED PRICE (USD): 2950.00 10/08/82

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 11.9 W(inches): 16.9 D(inches): 16.3 VOLUME(cu.in.): 3217

WEIGHT (lb): 32 TEMP RANGE (deg F): 32,+122

INPUT VOLTAGE: 10-40 POWER REQUIREMENT (Watts): 60

DISPLAY TYPE: CRT 13 LINES x 32 CHAR 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 13 2 WITH SEC. FUN ANTENNA HEIGHT (inches): 102

****ASF CORRECTION TECHNIQUE

****NOTCH FILTERS

****MICRO-PROCESSOR TYPE(S)

****STATIONS TRACKED & HOW USED

****MULTI-CHAIN CAPABILITY

****CERTIFICATIONS

****DYNAMIC RANGE

****MAX. GDOP FOR LAT-LONG

****NOISE BANDWIDTH

****SENSITIVITY (u VOLTS)

****SNR FOR ACQUISITION

****SNR FOR TRACK (MIN)

****SNR FOR POSITION DISPLAY

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # ONI 7000 OFFSHORE NAVIGATION INC
5728 JEFFERSON HWY POB 23504,NEW ORLEANS,LA,70183

PHONE 504-733-6790

LIST PRICE (USD): 17900.00 06/00/82 ADVERTISED PRICE (USD): 20950.00 05/07/83

DESIGNED FOR: A [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 7.62 W(inches): 7.5 D(inches): 12.6 VOLUME(cu.in.): 887

WEIGHT (lb): 18.1 TEMP RANGE (deg F): -76,+170

INPUT VOLTAGE: 18-32 POWER REQUIREMENT (Watts): 60

DISPLAY TYPE: FIBER OPTIC 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 7 + 12 POS ROTARY ANTENNA HEIGHT (inches): 6.25

****ASF CORRECTION TECHNIQUE
FULLY AUTOMATIC WITH DYNAMIC STORED MODEL

****NOTCH FILTERS
THREE AUTOMATIC COMPUTER-CONTROLLED

****MICRO-PROCESSOR TYPE(S)
TWO, 6809

****STATIONS TRACKED & HOW USED
UP TO 8 STATIONS IN UP TO 4 CHAINS SIMULTANEOUSLY, CROSS-RATE RECEIVER

****CERTIFICATIONS
TSO, C-60A, STC FOR IFR

****DYNAMIC RANGE
127dB

****MAX. GDOP FOR LAT-LONG
N/A

****NOISE BANDWIDTH
35kHz, 3dB

****SENSITIVITY (u VOLTS)
10dB ABOVE 1uV/METER

****SNR FOR ACQUISITION
-12dB FIRST STATION ON CHAIN, -18dB FOR REMAINING STATIONS

****SNR FOR TRACK (MIN)
-18dB

****SNR FOR POSITION DISPLAY

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # ADL 81 RACAL-DECCA AVIONICS INC.
8841 MONRAD DR. : SILVER SPRING, MD. 21208

PHONE 301-585-7460

LIST PRICE (USD): 00/00/75 ADVERTISED PRICE (USD): 19000.00 09/06/83

DESIGNED FOR: A [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 7.63 W(inches): 4.9 D(inches): 12.6 VOLUME(cu.in.): 470

WEIGHT (lb): 15 TEMP RANGE (deg F): -67,+158

INPUT VOLTAGE: 115 POWER REQUIREMENT (Watts): 50

DISPLAY TYPE: INCANDESCENT 7-SEG, 2LOP 0-9 KEY PAD? N

NUMBER AND TYPE OF DATA KEYS: ROTARY SWITCHES ANTENNA HEIGHT (inches): NONE

****ASF CORRECTION TECHNIQUE
NONE

****NOTCH FILTERS
2 AUTOMATIC, OPTIONAL EXTERNAL AS REQUIRED

****MICRO-PROCESSOR TYPE(S)
NONE

****STATIONS TRACKED & HOW USED
MASTER PLUS 3 SECONDARIES, THREE TD OUTPUTS PROVIDED

****MULTI-CHAIN CAPABILITY
TWO CHAINS, ONE TD EACH CHAIN POSSIBLE

****CERTIFICATIONS
MIL-E-5400 CLASS II, MIL-I-461A

****DYNAMIC RANGE
120dB

****MAX. GDOP FOR LAT-LONG
N/A

****NOISE BANDWIDTH
23kHz, 3dB IN TRACK; 5kHz 3dB SEARCH

****SENSITIVITY (u VOLTS)
10uV/METER ASSUMING 5cm ANTENNA

****SNR FOR ACQUISITION
-6dB

****SNR FOR TRACK (MIN)
-20dB

****SNR FOR POSITION DISPLAY
UNKNOWN

*****N1
ASSOCIATED CONTROL BOX 5.75WX4.5HX4.125D, 2.5 POUNDS

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # ADL 82 RACAL-DECCA AVIONICS INC.
8841 MONRAD DR. : SILVER SPRING, MD. 21208

PHONE 301-585-7460

LIST PRICE (USD): 00/00/80 ADVERTISED PRICE (USD): 21000.00 09/06/83

DESIGNED FOR: A [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 7.63 W(inches): 4.9 D(inches): 12.6 VOLUME(cu.in.): 470

WEIGHT (lb): 15 TEMP RANGE (deg F): -57,+158

INPUT VOLTAGE: 115 POWER REQUIREMENT (Watts): 50

DISPLAY TYPE: *N1 0-9 KEY PAD? N

NUMBER AND TYPE OF DATA KEYS: *N1 ANTENNA HEIGHT (inches): NONE

****ASF CORRECTION TECHNIQUE
NONE

****NOTCH FILTERS
2 AUTOMATIC, OPTIONAL EXTERNAL AS REQUIRED

****MICRO-PROCESSOR TYPE(S)
NONE

****STATIONS TRACKED & HOW USED
MASTER PLUS 3 SECONDARIES, 3TD OUTPUTS PROVIDED

****MULTI-CHAIN CAPABILITY
TWO CHAINS, ONE TD EACH

****CERTIFICATIONS
MIL-E-5400 CLASS II, MIL-I-461A

****DYNAMIC RANGE
120dB, 100dB DIFFERENTIAL

****MAX. GDOP FOR LAT-LONG
N/A

****NOISE BANDWIDTH
23kHz 3dB TRACK, 5kHz -3dB SEARCH

****SENSITIVITY (u VOLTS)
10uV/METER ASSUMING 5 cm ANTENNA

****SNR FOR ACQUISITION
-6dB

****SNR FOR TRACK (MIN)
-20dB

****SNR FOR POSITION DISPLAY
UNKNOWN

*****N1
OPERATES WITH ASSOCIATED FLIGHT MANG SYSTEM. OUTPUT VIA MIL-1553 INTERFACE.

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # RDI-XXX RADAR DEVICES INC.
CALIFORNIA

PHONE

LIST PRICE (USD): ADVERTISED PRICE (USD):

DESIGNED FOR: [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): W(inches): D(inches): VOLUME(cu.in.):

WEIGHT (lb): TEMP RANGE (deg F):

INPUT VOLTAGE: 11-16 POWER REQUIREMENT (Watts): 12

DISPLAY TYPE: 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 26 ANTENNA HEIGHT (inches):

****ASF CORRECTION TECHNIQUE
MANUALLY ENTERED

****STATIONS TRACKED & HOW USED
MASTER + 4 SECONDARIES, AUTOMATIC SELECTION, MASTER INDEPENDENT

****NOTCH FILTERS
4 FIXED

****MICRO-PROCESSOR TYPE(S)
8085

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
UNKNOWN

****DYNAMIC RANGE
UNKNOWN

****MAX. GDOP FOR LAT-LONG
NOT LIMITED

****NOISE BANDWIDTH
UNKNOWN

****SENSITIVITY (u VOLTS)
UNKNOWN

****SNR FOR ACQUISITION
-15dB

****SNR FOR POSITION DISPLAY
-15dB

****SNR FOR TRACK (MIN)
-20 dB

*****N1
USED AS LORAN SENSOR IN INTEGRATED NAVIGATION SYSTEM

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # RAYNAV 7000 RAYTHEON MARINE COMPANY
676 ISLAND POND RD MANCHESTER NH 03103

PHONE 603 668 1600

LIST PRICE (USD): 4990.00 ADVERTISED PRICE (USD):

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 4.5 W(inches): 8.8 D(inches): 7.93 VOLUME(cu.in.): 314

WEIGHT (lb): 4 TEMP RANGE (deg F):

INPUT VOLTAGE: 10-40 POWER REQUIREMENT (Watts): 8

DISPLAY TYPE: 2xLOP LCD 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 14 ANTENNA HEIGHT (inches): 96

****ASF CORRECTION TECHNIQUE
UNKNOWN

****NOTCH FILTERS
4 COMPUTER CONTROLLED

****MICRO-PROCESSOR TYPE(S)
UNKNOWN

****STATIONS TRACKED & HOW USED
MASTER PLUS 5 SECONDARIES, COMPUTED FROM TWO LOP

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
UNKNOWN

****DYNAMIC RANGE
110dB

****MAX. GDOP FOR LAT-LONG
UNKNOWN

****NOISE BANDWIDTH
UNKNOWN

****SENSITIVITY (u VOLTS)
0.8uV

****SNR FOR ACQUISITION
UNKNOWN

****SNR FOR TRACK (MIN)
UNKNOWN

****SNR FOR POSITION DISPLAY
UNKNOWN

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # RAYNAV 750 RAYTHEON MARINE COMPANY
676 ISLAND POND RD MANCHESTER NH 03103

PHONE 603 668 1600

LIST PRICE (USD): 1895.00 ADVERTISED PRICE (USD): 1795.00 05/07/83

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 4.5 W(inches): 8.25 D(inches): 10.2 VOLUME(cu.in.): 378

WEIGHT (lb): 8.9 TEMP RANGE (deg F):

INPUT VOLTAGE: 10-45 POWER REQUIREMENT (Watts): 13

DISPLAY TYPE: 2xLOP LCD 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 6 + 5 SEC, 12 POS RO ANTENNA HEIGHT (inches): 108

****ASF CORRECTION TECHNIQUE
MANUALLY ENTERED

****NOTCH FILTERS
6 AUTOMATICALLY ADJUSTED

****MICRO-PROCESSOR TYPE(S)
UNKNOWN

****STATIONS TRACKED & HOW USED
MASTER PLUS 4 SECONDARIES, COMPUTES POSITION BASED ON TWO LOP

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
UNKNOWN

****DYNAMIC RANGE
110dB

****MAX. GDOP FOR LAT-LONG
UNKNOWN

****NOISE BANDWIDTH
UNKNOWN

****SENSITIVITY (u VOLTS)
1uV

****SNR FOR ACQUISITION
UNKNOWN

****SNR FOR TRACK (MIN)
UNKNOWN

****SNR FOR POSITION DISPLAY
UNKNOWN

*****N1
WAYPOINTS, 50 TRACK SPEED, 300 KTS

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # RAYNAV 6000 RAYTHEON MARINE COMPANY
676 ISLAND POND RD MANCHESTER NH 03103

PHONE 603-688-1600

LIST PRICE (USD): ADVERTISED PRICE (USD):

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 11.5 W(inches): 19.7 D(inches): 11 VOLUME(cu.in.): 2492

WEIGHT (lb): 25 TEMP RANGE (deg F):

INPUT VOLTAGE: 10-40 POWER REQUIREMENT (Watts): 45

DISPLAY TYPE: 2-LOP 0-9 KEY PAD? N

NUMBER AND TYPE OF DATA KEYS: 4-ROTARY SW'S ANTENNA HEIGHT (inches): 96

****ASF CORRECTION TECHNIQUE
UNKNOWN

****NOTCH FILTERS
2 MANUALLY ADJUSTED

****MICRO-PROCESSOR TYPE(S)
UNKNOWN

****STATIONS TRACKED & HOW USED
MASTER LUS 5 SECONDARIES, TWO LOP

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
UNKNOWN

****DYNAMIC RANGE
110dB

****MAX. GDOP FOR LAT-LONG
UNKNOWN

****NOISE BANDWIDTH
UNKNOWN

****SENSITIVITY (u VOLTS)
0.8uV

****SNR FOR ACQUISITION
UNKNOWN

****SNR FOR TRACK (MIN)
UNKNOWN

****SNR FOR POSITION DISPLAY
UNKNOWN

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # SI-TEX/KODEN 760 SI-TEX
POB 6700, CLEARWATER FLA, 33518
PHONE 813-535-4681

LIST PRICE (USD): 1795.00 06/00/83 ADVERTISED PRICE (USD): 1795.00 06/00/83

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): W(inches): D(inches): VOLUME(cu.in.): 199.6

WEIGHT (lb): 8 TEMP RANGE (deg F): 32,+122

INPUT VOLTAGE: 11-38 POWER REQUIREMENT (Watts): 6

DISPLAY TYPE: 2-LOP, LCD, LAT/LONG 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 6,+L',L/R FUNCT SCAN ANTENNA HEIGHT (inches):

****ASF CORRECTION TECHNIQUE
TD AND LAT-LONG, CALIMODE OR EQUIVALENT

****NOTCH FILTERS
2 FIXED, THREE AUTOMATIC

****SENSITIVITY (u VOLTS)
1 uV/METER, BEING UPGRADED

****MICRO-PROCESSOR TYPE(S)
UNKNOWN

****STATIONS TRACKED & HOW USED
ALL STATIONS, TD & LAT-LONG/GC COURSE COMPUTER

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
FCC, CANADA D.O.C., RTCM MPS 70

****DYNAMIC RANGE
105dB

****MAX. GDOP FOR LAT-LONG
NO

****NOISE BANDWIDTH
UNKNOWN

****SNR FOR ACQUISITION
UNKNOWN

****SNR FOR TRACK (MIN)
UNKNOWN

****SNR FOR POSITION DISPLAY
UNKNOWN

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # SI-TEX/KODEN 787 SI-TEX
POB 6700, CLEARWATER FLA, 33518
PHONE 813-535-4681

LIST PRICE (USD): 1095.00 02/01/83 ADVERTISED PRICE (USD): 629.00 05/07/83

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 6.5 W(inches): 5.5 D(inches): 3 VOLUME(cu.in.): 107.3

WEIGHT (lb): 3 TEMP RANGE (deg F): 32,+122

INPUT VOLTAGE: 11-15 POWER REQUIREMENT (Watts): 6

DISPLAY TYPE: 2-LOP, LCD 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 6,+2,L/R FUNCT SCAN ANTENNA HEIGHT (inches): N/A

****ASF CORRECTION TECHNIQUE
NONE

****NOTCH FILTERS
2 FIXED, ONE OPTIONAL

****SENSITIVITY (u VOLTS)
5uV/METER

****MICRO-PROCESSOR TYPE(S)
UNKNOWN

****STATIONS TRACKED & HOW USED
MASTER PLUS 4 SECONDARIES, 2 TD DISPLAYED

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
FCC, CANADA D.O.C.

****MAX. GDOP FOR LAT-LONG
UNKNOWN

****NOISE BANDWIDTH
UNKNOWN

****SNR FOR ACQUISITION
UNKNOWN

****SNR FOR TRACK (MIN)
UNKNOWN

****SNR FOR POSITION DISPLAY
UNKNOWN

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # SI-TEX/KODEN 787C SI-TEX
POB 6700, CLEARWATER FLA, 33518
PHONE 813-535-4681

LIST PRICE (USD): 1395.00 02/01/83 ADVERTISED PRICE (USD): 899.00 05/07/83

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 6.5 W(inches): 5.5 D(inches): 3 VOLUME(cu.in.): 107.3

WEIGHT (lb): 3 TEMP RANGE (deg F): 32,+122

INPUT VOLTAGE: 11-15 POWER REQUIREMENT (Watts): 6

DISPLAY TYPE: 2-LOP, LCD 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 6,+2,L/R FUNCT SCAN ANTENNA HEIGHT (inches): N/A

****ASF CORRECTION TECHNIQUE
MANUALLY ENTERED AT KNOWN LOCATION AND TD-ANY LOCATION

****NOTCH FILTERS
2 FIXED 1 OPTIONAL

****MICRO-PROCESSOR TYPE(S)
UNKNOWN

****STATIONS TRACKED & HOW USED
ALL STATIONS, TD AND LAT-LONG

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
FCC, CANADA D.O.C., RTCM MPS 70

****DYNAMIC RANGE
105dB

****MAX. GDOP FOR LAT-LONG
UNKNOWN

±J****NOISE BANDWIDTH
UNKNOWN

****SENSITIVITY (u VOLTS)
LESS THAN 5uV/METER

****SNR FOR ACQUISITION
UNKNOWN

****SNR FOR TRACK (MIN)
UNKNOWN

****SNR FOR POSITION DISPLAY
UNKNOWN

*****N1
WAYPOINTS, 8 TRACK SPEED, 40 KTS

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # SI-TEX/KODEN 717 SI-TEX
POB 6700, CLEARWATER FLA, 33518
PHONE 813-535-4681

LIST PRICE (USD): 2995.00 05/07/83 ADVERTISED PRICE (USD): 1995.00 11/00/83

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 6.4 W(inches): 10.5 D(inches): 10.7 VOLUME(cu.in.): 719

WEIGHT (lb): 12.5 TEMP RANGE (deg F): 32,+122

INPUT VOLTAGE: 11-40 POWER REQUIREMENT (Watts): 16

DISPLAY TYPE: 2-LOP,1-NAV,INFO LCD,2L/L 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 7,+S-SEC,+12 ROT,1TG ANTENNA HEIGHT (inches): N/A

****ASF CORRECTION TECHNIQUE
MANUAL-FOR ANY OR ALL TD, MANUAL-AT KNOWN LOCATION

****NOTCH FILTERS
4 AUTOMATIC, 1 PRESET 88kHz

****MICRO-PROCESSOR TYPE(S)
UNKNOWN

****STATIONS TRACKED & HOW USED
ALL STATIONS, TD

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
FCC, CANADA D.O.C.

****DYNAMIC RANGE
80dB

****MAX. GDOP FOR LAT-LONG
UNKNOWN

****NOISE BANDWIDTH
UNKNOWN

****SENSITIVITY (u VOLTS)
LESS THAN 2uV/METER

****SNR FOR ACQUISITION
UNKNOWN

****SNR FOR TRACK (MIN)
UNKNOWN

****SNR FOR POSITION DISPLAY
UNKNOWN

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # TL-838 SIMRAD, INC
2215 N.W. MARKET ST., SETTLE, WA 98107

PHONE 206-733-1334

LIST PRICE (USD): ADVERTISED PRICE (USD):

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 4.9 W(inches): 12.6 D(inches): 12.6 VOLUME(cu.in.): 777

WEIGHT (lb): 13.2 TEMP RANGE (deg F):

INPUT VOLTAGE: 12-36 POWER REQUIREMENT (Watts): 26

DISPLAY TYPE: 2-LOP LED 0-9 KEY PAD? N

NUMBER AND TYPE OF DATA KEYS: ROTARY SW'S ANTENNA HEIGHT (inches): 120

****DYNAMIC RANGE
110 DB

****STATIONS TRACKED & HOW USED
MASTER DEPENDENT

****ASF CORRECTION TECHNIQUE
NONE NO CALIBRATION CAPABILITY

****SENSITIVITY (u VOLTS)
1 uV/M

****SNR FOR ACQUISITION
UNKNOWN

****SNR FOR TRACK (MIN)
UNKNOWN

****SNR FOR POSITION DISPLAY
UNKNOWN

****NOTCH FILTERS
4 ADJUSTABLE, 2 PRESET

****MICRO-PROCESSOR TYPE(S)
UNKNOWN

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
RTCM-70 PART 2 MPS

****MAX. GDOP FOR LAT-LONG
N/A

****NOISE BANDWIDTH
UNKNOWN

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # TL-856 SIMRAD, INC
2215 N.W. MARKET ST., SETTLE, WA 98107
PHONE 206-733-1334

LIST PRICE (USD): ADVERTISED PRICE (USD):

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 6.2 W(inches): 12.6 D(inches): 12.6 VOLUME(cu.in.): 984

WEIGHT (lb): 14.3 TEMP RANGE (deg F):

INPUT VOLTAGE: 12-36 POWER REQUIREMENT (Watts): 29

DISPLAY TYPE: 2-LOP LED 0-9 KEY PAD? N

NUMBER AND TYPE OF DATA KEYS: 6-THUMB + 3 ROTARY ANTENNA HEIGHT (inches): 120

****ASF CORRECTION TECHNIQUE
NONE NO MANUAL CALIB.

****STATIONS TRACKED & HOW USED
MASTER DEPENDENT TRACKS 2 SECONDARIES

****NOTCH FILTERS
4 TUNEABLE, 2 PRESET

****MICRO-PROCESSOR TYPE(S)
UNKNOWN

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
RTCM-70 PART 2 MPS

****DYNAMIC RANGE
110dB

****MAX. GDOP FOR LAT-LONG
UNKNOWN

****NOISE BANDWIDTH
UNKNOWN

****SENSITIVITY (u VOLTS)
1uV

****SNR FOR ACQUISITION
UNKNOWN

****SNR FOR TRACK (MIN)
UNKNOWN

****SNR FOR POSITION DISPLAY
UNKNOWN

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # CLX-95 SRD LABS
381 McGLINCEY LN. CAMPBELL CA 95008

PHONE

LIST PRICE (USD): 1795.00 10/00/81 ADVERTISED PRICE (USD): 00/00/00

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 2.5 W(inches): 6.25 D(inches): 10.5 VOLUME(cu.in.): 164

WEIGHT (lb): 6 TEMP RANGE (deg F): 32,+122

INPUT VOLTAGE: 11-16 POWER REQUIREMENT (Watts): 14

DISPLAY TYPE: 15 LEDS 0-9 KEY PAD? N

NUMBER AND TYPE OF DATA KEYS: 6 + 6 SEC FUNCT. ANTENNA HEIGHT (inches): 96

****ASF CORRECTION TECHNIQUE
MANUALLY ENTERED AT KNOWN POINT. LINEAR APPROXIMATION TO GRID

****NOTCH FILTERS
4 FIXED

****MICRO-PROCESSOR TYPE(S)
8085

****STATIONS TRACKED & HOW USED
MASTER PLUS 4 SECONDARIES, AUTO OR MANUAL SELECTION

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
UNKNOWN

****CERTIFICATIONS
UNKNOWN

****MAX. GDOP FOR LAT-LONG
NOT LIMITED

****SENSITIVITY (u VOLTS)
UNKNOWN

****SNR FOR ACQUISITION
-10dB

****SNR FOR TRACK (MIN)
-16dB

****SNR FOR POSITION DISPLAY
ERROR INDICATION -10dB

****NOISE BANDWIDTH
UNKNOWN

*****N1
$295 PRICE ADVERTISED AS "OVER-STOCKED" OFFERING

*****N2
WAYPOINTS, 99 TRACK SPEED, 99 KTS

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # L-NAV 25 SRD LABS
381 McGLINCEY LN. CAMPBELL CA 95008

PHONE

LIST PRICE (USD): 995.00 01/01/83 ADVERTISED PRICE (USD): 995.00 01/01/83

DESIGNED FOR: A [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 2.5 W(inches): 6.25 D(inches): 10.5 VOLUME(cu.in.): 164

WEIGHT (lb): 3 TEMP RANGE (deg F): 32,+122

INPUT VOLTAGE: 11-16 POWER REQUIREMENT (Watts): 11

DISPLAY TYPE: 15 LEDS 0-9 KEY PAD? N

NUMBER AND TYPE OF DATA KEYS: 6 + 6 SEC FUNCT. ANTENNA HEIGHT (inches):

****SNR FOR ACQUISITION
-10dB

****SNR FOR TRACK (MIN)
-16dB

****ASF CORRECTION TECHNIQUE
MANUALLY ENTERED USES LOCAL GRADIENTS AND TD CORRECTION

****STATIONS TRACKED & HOW USED
TRACKS MASTER AND TWO SECONDARIES

****NOTCH FILTERS
6 FIXED

****MICRO-PROCESSOR TYPE(S)
8085

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
NONE

****MAX. GDOP FOR LAT-LONG
NOT LIMITED

****NOISE BANDWIDTH
UNKNOWN

****SENSITIVITY (u VOLTS)
UNKNOWN

****DYNAMIC RANGE
UNKNOWN

****SNR FOR POSITION DISPLAY
ERROR INDICATION -10dB

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # MLX SRD LABS
381 McGLINCEY LN. CAMPBELL CA 95008

PHONE

LIST PRICE (USD): 995.00 01/01/83 ADVERTISED PRICE (USD): 995.00 01/01/83

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 2.5 W(inches): 6.25 D(inches): 10.5 VOLUME(cu.in.): 164

WEIGHT (lb): 3 TEMP RANGE (deg F): 32,+122

INPUT VOLTAGE: 11-16 POWER REQUIREMENT (Watts): 11

DISPLAY TYPE: 15 LEDS 0-9 KEY PAD? N

NUMBER AND TYPE OF DATA KEYS: 6 + 6 SEC FUNCT. ANTENNA HEIGHT (inches): 96

****SNR FOR ACQUISITION
-10dB

****SNR FOR TRACK (MIN)
-16dB

****ASF CORRECTION TECHNIQUE
MANUALLY ENTERED USES LOCAL GRADIENTS AND TD CORRECTION

****STATIONS TRACKED & HOW USED
TRACKS MASTER AND TWO SECONDARIES

****NOTCH FILTERS
4 PRESET

****MICRO-PROCESSOR TYPE(S)
8085

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
NONE

****MAX. GDOP FOR LAT-LONG
NOT LIMITED

****NOISE BANDWIDTH
UNKNOWN

****SENSITIVITY (u VOLTS)
UNKNOWN

****DYNAMIC RANGE
UNKNOWN

****SNR FOR POSITION DISPLAY
ERROR INDICATION, -10dB

LORAN-C RECEIVER MANUFACTURERS DATE 04/10/84

MODEL # TDL-711A TELEDYNE SYSTEMS COMPANY
19601 NORDHOFF STREET NORTHRIDGE, CA 91324

PHONE 213-886-2211

LIST PRICE (USD): 14950 01/01/83 ADVERTISED PRICE (USD): 12000.00 02/01/84

DESIGNED FOR: A [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 7.62 W(inches): 7.5 D(inches): 12.6 VOLUME(cu.in.): 720

WEIGHT (lb): 12 TEMP RANGE (deg F): -67,+170

INPUT VOLTAGE: 18-32 POWER REQUIREMENT (Watts): 40

DISPLAY TYPE: GAS DISCHARGE 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 16 +ROTARY SW. ANTENNA HEIGHT (inches): 16.5

****ASF CORRECTION TECHNIQUE
MANUAL INPUT

****NOTCH FILTERS
2 MANUAL + OPTIONAL EXTERNAL AS REQUIRED

****MICRO-PROCESSOR TYPE(S)
PPS4

****STATIONS TRACKED & HOW USED
MASTER + 4 SECONDARIES. MANUAL SELECTION, RECEIVER ADVISES BEST

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
STC, TSO IN PROCESS

***DYNAMIC RANGE
UNKNOWN

****NOISE BANDWIDTH
UNKNOWN

****SENSITIVITY (u VOLTS)
10uV

****SNR FOR TRACK (MIN)
UNKNOWN

****SNR FOR POSITION DISPLAY
UNKNOWN

****MAX. GDOP FOR LAT-LONG
N/A

*****N1
CDU 4.5(H) X 5.75(W) X 6.5(D) 3 LBS

AD-A144 199 A SURVEY OF STATE-OF-THE-ART LORAN-C RECEIVERS(U) 2/2
TRANSPORTATION SYSTEMS CENTER CAMBRIDGE MA
F D MACKENZIE ET AL. JUN 84 DOT-TSC-CG-84-1
UNCLASSIFIED DOT-CG-N-1-84 DTRS57-83-C-0029 F/G 17/7 NL

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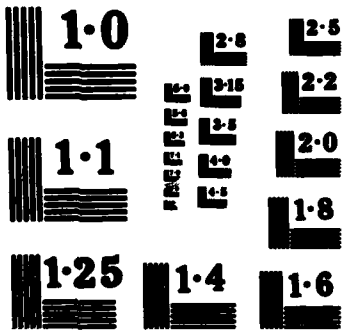
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LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # TI 9900 TEXAS INSTRUMENTS
MARINE PROD. POB 405 MS 3438 LEWISVILLE TX 75067

PHONE 214-462-5220

LIST PRICE (USD): 3895.00 11/01/82 ADVERTISED PRICE (USD): 1499.00 05/07/68

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 3.4 W(inches): 9.7 D(inches): 12.5 VOLUME(cu.in.): 412

WEIGHT (lb): 9 TEMP RANGE (deg F): 32,+122

INPUT VOLTAGE: 11-16 POWER REQUIREMENT (Watts): 16

DISPLAY TYPE: 2TD OR L/L,GAS DSCHRG 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 20PB,18 SEC FNCT ANTENNA HEIGHT (inches): 102

****ASF CORRECTION TECHNIQUE
DIRECT CALIBRATION FROM KNOWN POSITION,OR MANUAL INPUT OF KNOWN ASF CORRECTION.

****NOTCH FILTERS
4 FACTORY PRESET FOR AREA OF OPERATION

****MICRO-PROCESSOR TYPE(S)
TMS 9900

****STATIONS TRACKED & HOW USED
ALL IN CHAIN, USER SELECTED PAIR FOR LAT-LONG CONVERSION

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
MPS TYPE 1, PART 2 OF RTCM-70

****DYNAMIC RANGE
90dB, 10uV TO 300mV

****MAX. GDOP FOR LAT-LONG
N/A

****SENSITIVITY (u VOLTS)
N/A

****SNR FOR ACQUISITION
-13dB, -10dB PREFERRED FOR ACCURACY

****SNR FOR TRACK (MIN)
-15dB

****SNR FOR POSITION DISPLAY
-15dB

****NOISE BANDWIDTH
N/A

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # TI 9900N TEXAS INSTRUMENTS
MARINE PROD. POB 405 MS 3438 LEWISVILLE TX 75067

PHONE 214-462-5220

LIST PRICE (USD): 2295.00 11/01/82 ADVERTISED PRICE (USD): 1836.00 05/07/83

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 3.4 W(inches): 9.7 D(inches): 12.5 VOLUME(cu.in.): 412

WEIGHT (lb): 9 TEMP RANGE (deg F): 32,+122

INPUT VOLTAGE: 11-16 POWER REQUIREMENT (Watts): 16

DISPLAY TYPE: 2 LOP GAS DISCHRG 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 20PB,18 SEC FNCT ANTENNA HEIGHT (inches): 102

****ASF CORRECTION TECHNIQUE
DIRECT CALIBRATION FROM KNOWN POSITION, OR MANUAL INPUT OF KNOWN ASF CORRECTION.

****NOTCH FILTERS
2 FACTORY PRESET FOR OPERATIONAL AREA PLUS 2 USER ADJUSTED FROM FRONT PANEL

****MICRO-PROCESSOR TYPE(S)
TMS9900

****STATIONS TRACKED & HOW USED
ALL STATIONS IN CHAIN, USER SELECTED PAIR FOR LAT-LONG CONVERSION

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
MPS TYPE 1, PART 2 OF RTCM-70

****DYNAMIC RANGE
90dB, 10uV TO 300mV

****MAX. GDOP FOR LAT-LONG
N/A

****NOISE BANDWIDTH
N/A

****SENSITIVITY (u VOLTS)
N/A

****SNR FOR ACQUISITION
-13dB, -10dB PREFERRED FOR ACCURACY

****SNR FOR TRACK (MIN)
-15dB

****SNR FOR POSITION DISPLAY
-15dB

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # TI 5000 TEXAS INSTRUMENTS
AVIONIC PROD. POB 405 MS 3438 LEWISVILLE TX 75067

PHONE 214-462-5220

LIST PRICE (USD): ADVERTISED PRICE (USD): 3495.00 11/00/83

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): W(inches): D(inches): VOLUME(cu.in.):

WEIGHT (lb): TEMP RANGE (deg F):

INPUT VOLTAGE: 10-40 POWER REQUIREMENT (Watts):

DISPLAY TYPE: 5X7 DOT MATRIX 0-9 KEY PAD?

NUMBER AND TYPE OF DATA KEYS: ANTENNA HEIGHT (inches):

****ASF CORRECTION TECHNIQUE
Y-PROBABLY SEAWATER, CAN USE MANUAL UPDATE/CAL.

****STATIONS TRACKED & HOW USED
RECEIVES TDS FROM LC

****NOTCH FILTERS
NA

****MICRO-PROCESSOR TYPE(S)
TMS9995 (?)

****MULTI-CHAIN CAPABILITY
NA

****CERTIFICATIONS
UNKNOWN

****DYNAMIC RANGE
NA

****MAX. GROP FOR LAT-LONG
NA

****NOISE BANDWIDTH
NA

****SENSITIVITY (u VOLTS)
NA

****SNR FOR ACQUISITION
NA

****SNR FOR POSITION DISPLAY
NA

****SNR FOR TRACK (MIN)
NA

*****N1
TYPICAL ARRANGEMENT TO INTERFACE WITH 9900/9000 OR SOMETHING TAKES TC ,
CONVERTS TO LOPS, COMPARES WITH SAT NAV, KALMAN FI

*****N2
SAT NAV AUGMENTED WITH LORAN-C

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # TI 9000A TEXAS INSTRUMENTS
MARINE PROD. POB 405 MS 3438 LEWISVILLE TX 75067

PHONE 214-462-5220

LIST PRICE (USD): 995.00 11/01/82 ADVERTISED PRICE (USD): 749.00 05/07/83

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 3.4 W(inches): 9.7 D(inches): 12.5 VOLUME(cu.in.): 412

WEIGHT (lb): 9 TEMP RANGE (deg F): 32,+122

INPUT VOLTAGE: 11-16 POWER REQUIREMENT (Watts): 18

DISPLAY TYPE: AUT/SEQ 4LOP, GAS DSCHRG 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 20 PB ANTENNA HEIGHT (inches): 102

****NOTCH FILTERS
4 FACTORY TUNED NOTCHES SET FOR AREA OF OPERATION

****ASF CORRECTION TECHNIQUE
MANUAL, WITH CHARTS OR AUTOMATIC WITH TI5000 LORSAT(TM) INTEGRATED NAVIGATION SYSTEM

****MICRO-PROCESSOR TYPE(S)
TMS 9900

****STATIONS TRACKED & HOW USED
ALL IN CHAIN, DIRECT READOUT OF TD

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
N/A

****DYNAMIC RANGE
90dB, 10uV TO 300mV

****MAX. GROP FOR LAT-LONG
N/A

****NOISE BANDWIDTH
N/A

****SENSITIVITY (u VOLTS)
N/A

****SNR FOR ACQUISITION
-13dB, -10dB PREFERRED FOR ACCURACY

****SNR FOR TRACK (MIN)
-13dB

****SNR FOR POSITION DISPLAY
N/A

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # TI 9900N TEXAS INSTRUMENTS
MARINE PROD. POB 405 MS 3438 LEWISVILLE TX 75067

PHONE 214-462-5220

LIST PRICE (USD): 1395.00 11/01/82 ADVERTISED PRICE (USD): 1349.00 05/07/83

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 3.4 W(inches): 9.7 D(inches): 12.5 VOLUME(cu.in.): 412

WEIGHT (lb): 9 TEMP RANGE (deg F): 32,+122

INPUT VOLTAGE: 11-16 POWER REQUIREMENT (Watts): 18

DISPLAY TYPE: AUT/SEQ 4LOP, GAS DSCHRG 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 20 PB ANTENNA HEIGHT (inches): 102

****ASF CORRECTION TECHNIQUE
MANUAL, WITH CHARTS, OR AUTOMATIC WITH TI5000 LORSAT(TM) INTEGRATED NAVIGATION SYSTEM

****NOTCH FILTERS
2 FACTORY TUNED NOTCHES SET FOR AREA OF OPERATION PLUS 2 EXTERNAL USER TUNED NOTCHES

****MICRO-PROCESSOR TYPE(S)
TMS 9900

****STATIONS TRACKED & HOW USED
ALL IN CHAIN, DIRECT READOUT OF TD

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
LORAN MRS

****DYNAMIC RANGE
90dB, 10uV TO 300mV

****MAX. GDOP FOR LAT-LONG
N/A

****NOISE BANDWIDTH
N/A

****SENSITIVITY (u VOLTS)
N/A

****SNR FOR ACQUISITION
-13dB, -10dB PREFERRED FOR ACCURACY

****SNR FOR TRACK (MIN)
-13dB

****SNR FOR POSITION DISPLAY
N/A

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # TI 9000S TEXAS INSTRUMENTS
MARINE PROD. POB 405 MS 3438 LEWISVILLE TX 75067
PHONE 214-462-5220

LIST PRICE (USD): 1295.00 11/01/82 ADVERTISED PRICE (USD): 1036.00 05/07/83

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 3.4 W(inches): 9.7 D(inches): 12.5 VOLUME(cu.in.): 412

WEIGHT (lb): 8.6 TEMP RANGE (deg F): 32,+122

INPUT VOLTAGE: 11-16 POWER REQUIREMENT (Watts): 18

DISPLAY TYPE: AUT/SEQ 4TD, GAS DSCHRG 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 20 PB ANTENNA HEIGHT (inches): 102

****ASF CORRECTION TECHNIQUE
MANUAL WITH CHARTS OR AUTOMATIC WITH TI5000 LORSAT(TM) INTEGRATED NAVIGATION SYSTEM

****NOTCH FILTERS
4 FACTORY TUNED NOTCHES SET FOR AREA OF OPERATION

****MICRO-PROCESSOR TYPE(S)
TMS9900

****STATIONS TRACKED & HOW USED
ALL IN CHAIN, DIRECT READOUT OF TD

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
N/A

****DYNAMIC RANGE
90dB, 10uV TO 300mV

****MAX. GDOP FOR LAT-LONG
N/A

****NOISE BANDWIDTH
N/A

****SENSITIVITY (u VOLTS)
N/A

****SNR FOR ACQUISITION
-13dB, -10dB PREFERRED FOR ACCURACY

****SNR FOR TRACK (MIN)
-13dB

****SNR FOR POSITION DISPLAY
N/A

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # TI 9100 TEXAS INSTRUMENTS
AVIONIC PROD. POB 405 MS 3438 LEWISVILLE TX 75067

PHONE 214-462-5220

LIST PRICE (USD): ADVERTISED PRICE (USD): 7995.00 11/01/82

DESIGNED FOR: A [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 3.25 W(inches): 6.25 D(inches): 11.6 VOLUME(cu.in.): 235

WEIGHT (lb): 6.7 TEMP RANGE (deg F): 5,+131

INPUT VOLTAGE: 11-33 POWER REQUIREMENT (Watts): 24

DISPLAY TYPE: 2TD OR L/L,GAS DSCHRG 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 20PB,SBC FN 18 ANTENNA HEIGHT (inches): 21

****ASF CORRECTION TECHNIQUE
DIRECT CALIBRATION AT KNOWN POSITION OR MANUAL INPUT OF KNOWN ASF CORRECTION

****NOTCH FILTERS
AUTOMATIC

****MICRO-PROCESSOR TYPE(S)
TMS9901

****STATIONS TRACKED & HOW USED
ALL STATIONS IN CHAIN, AUTO SELECT OF TRIAD INCLUDING MASTER-INDEPENDENT OPERATION

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
TSO C60A, MULTIPLE STC, IFR CERTIFIED FOR US NATIONAL AIRSPACE, LORAN-C COVERAGE AREA

****DYNAMIC RANGE
N/A

****MAX. GDOP FOR LAT-LONG
N/A

****NOISE BANDWIDTH
N/A

****NOISE BANDWIDTH
N/A

****SNR FOR ACQUISITION
-13dB, -10dB PREFERRED FOR ACCURACY

****SNR FOR TRACK (MIN)
-15dB

****SNR FOR POSITION DISPLAY
-13dB

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # TI 9900SP TEXAS INSTRUMENTS
MARINE PROD. POB 405 MS 3438 LEWISVILLE TX 75067

PHONE 214-462-5220

LIST PRICE (USD): 2395.00 11/01/82 ADVERTISED PRICE (USD): 1995.00 05/07/83

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 3.4 W(inches): 9.7 D(inches): 12.5 VOLUME(cu.in.): 412

WEIGHT (lb): 9 TEMP RANGE (deg F): 32,+122

INPUT VOLTAGE: 11-16 POWER REQUIREMENT (Watts): 16

DISPLAY TYPE: 2TD OR L/L,GAS DSCHRG 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 20PB, 18SEC FNCT ANTENNA HEIGHT (inches): 102

****ASF CORRECTION TECHNIQUE
DIRECT CALIBRATION FROM KNOWN POSITION, MANUAL INPUT OF KNOWN ASF CORRECTION OR AUTOMATIC W

ITH TI5000 LORSAT(TM) INTEGRATE

****NOTCH FILTERS
4 FACTORY PRESET FOR OPERATIONAL AREA

****MICRO-PROCESSOR TYPE(S)
TMS 9900

****STATIONS TRACKED & HOW USED
ALL IN CHAIN, USER SELECTED PAIR FOR LAT-LONG CONVERSION

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
MPS TYPE 1, PART 2 OF RTCM-70

****DYNAMIC RANGE
90dB, 10uV TO 300mV

****MAX. GDOP FOR LAT-LONG
N/A

****NOISE BANDWIDTH
N/A

****SENSITIVITY (u VOLTS)
N/A

****SNR FOR ACQUISITION
-13dB, -10dB PREFERRED FOR ACCURACY

****SNR FOR TRACK (MIN)
-15dB

****SNR FOR POSITION DISPLAY
-15dB

*****M1
WAYPOINTS, 10 TRACK SPEED, 40 KTS

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # TI 9900SPN TEXAS INSTRUMENTS
MARINE PROD. POB 405 MS 3438 LEWISVILLE TX 75067

PHONE 214-462-5220

LIST PRICE (USD): 2795.00 11/01/82 ADVERTISED PRICE (USD): 2495.00 05/07/83

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 3.4 W(inches): 9.7 D(inches): 12.5 VOLUME(cu.in.): 412

WEIGHT (lb): 9 TEMP RANGE (deg F): 32,+122

INPUT VOLTAGE: 11-16 POWER REQUIREMENT (Watts): 16

DISPLAY TYPE: 2TD OR L/L,GAS DSCHRG 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 20PB, 18 SEC FNCT ANTENNA HEIGHT (inches): 102

****ASF CORRECTION TECHNIQUE
DIRECT CALIBRATION FROM KNOWN POSITION, MANUAL INPUR OF KNOWN ASF CORRECTION OR AUTOMATI WI

TH TIS000 LORSAT(TM) INTEGRATED

****NOTCH FILTERS
2 FACTORY PRESET FOR OPERATIONAL AREA PLUS 2 USER ADJUSTED FROM FRONT PANEL

****MICRO-PROCESSOR TYPE(S)
TMS9900

****STATIONS TRACKED & HOW USED
ALL IN CHAIN, USER SELECTED PAIR FOR LAT-LONG CONVERSION

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
MPS TYPE 1, PART 2 OF RTCM-70

****DYNAMIC RANGE
90dB, 10uV TO 300mV

****MAX. GROP FOR LAT-LONG
N/A

****NOISE BANDWIDTH
N/A

****SENSITIVITY (u VOLTS)
N/A

****SNR FOR ACQUISITION
-13dB, -10dB PREFERRED FOR ACCURACY

****SNR FOR TRACK (MIN)
-15dB

****SNR FOR POSITION DISPLAY
-15dB

*****M1
WAYPOINTS, 10 TRACK SPEED, 40 KTS

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # TI 9900NS TEXAS INSTRUMENTS
MARINE PROD. POB 405 MS 3438 LEWISVILLE TX 75067

PHONE 214-462-5220

LIST PRICE (USD): 1695.00 11/01/82 ADVERTISED PRICE (USD): 1356.00 05/07/83

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 3.4 W(inches): 9.7 D(inches): 12.5 VOLUME(cu.in.): 412

WEIGHT (lb): 8.6 TEMP RANGE (deg F): 32,+122

INPUT VOLTAGE: 11-16 POWER REQUIREMENT (Watts): 18

DISPLAY TYPE: AUT/SEQ 4TD, GAS DSCHRG 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 20 ANTENNA HEIGHT (inches): 102

****ASF CORRECTION TECHNIQUE
MANUAL WITH CHARTS OR AUTOMATIC WITH TI5000 LORSAT(TM) INTEGRATED NAVIGATION SYSTEM

****NOTCH FILTERS
2 FACTORY PRESET FOR AREA OF OPERATION, 2 USER TUNED FROM FRONT PANEL

****MICRO-PROCESSOR TYPE(S)
TMS 9900

****STATIONS TRACKED & HOW USED
ALL IN CHAIN, DIRECT READOUT OF TD

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
N/A

****DYNAMIC RANGE
90dB, 10uV TO 300mV

****MAX. GDOP FOR LAT-LONG
N/A

****NOISE BANDWIDTH
N/A

****SENSITIVITY (u VOLTS)
N/A

****SNR FOR ACQUISITION
-13dB, -10dB PREFERRED FOR ACCURACY

****SNR FOR TRACK (MIN)
-13dB

****SNR FOR POSITION DISPLAY
N/A

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # TI 91 TEXAS INSTRUMENTS
AVIONIC PROD. POB 405 MS 3438 LEWISVILLE TX 75067

PHONE 214-462-5220

LIST PRICE (USD): 10950.00 05/07/83 ADVERTISED PRICE (USD): 00/00/00

DESIGNED FOR: A [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 7.1 W(inches): 4.9 D(inches): 13 VOLUME(cu.in.): 476

WEIGHT (lb): 9.1 TEMP RANGE (deg F): -40,+158

INPUT VOLTAGE: 11-33 POWER REQUIREMENT (Watts): 28

DISPLAY TYPE: 2TD OR L/L,GAS DSCHRG 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 20PB,SEC FN 18 ANTENNA HEIGHT (inches): 21

****ASF CORRECTION TECHNIQUE
DIRECT CALIBRATION AT KNOWN POSITION OR MANUAL INPUT OF ASF CORRECTION

****NOTCH FILTERS
AUTOMATIC

****MICRO-PROCESSOR TYPE(S)
TMS9901

****STATIONS TRACKED & HOW USED
ALL STATIONS IN CHAIN, AUTO SELECT OF TRIAL INCLUDING MASTER-INDEPENDENT OPERATION

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
TSO C60A, MULTIPLE STC & IFR FOR US NATIONAL AIRSPACE, LORAN-C COVERAGE AREA

****DYNAMIC RANGE
N/A

****MAX. GDOP FOR LAT-LONG
N/A

****NOISE BANDWIDTH
N/A

****SENSITIVITY (u VOLTS)
N/A

****SNR FOR ACQUISITION
-13dB,-10dB PREFERRED FOR ACCURACY

****SNR FOR TRACK (MIN)
-15dB

****SNR FOR POSITION DISPLAY
-13dB

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # TI 9000NS TEXAS INSTRUMENTS
MARINE PROD. POB 405 MS 3438 LEWISVILLE TX 75067

PHONE 214-462-5220

LIST PRICE (USD): 1695.00 11/01/82 ADVERTISED PRICE (USD): 1356.00 05/07/83

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 3.4 W(inches): 9.7 D(inches): 12.5 VOLUME(cu.in.): 412

WEIGHT (lb): 8.6 TEMP RANGE (deg F): 32,+122

INPUT VOLTAGE: 11-16 POWER REQUIREMENT (Watts): 18

DISPLAY TYPE: AUT/SEQ 4TD, GAS DSCHRG 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 20 ANTENNA HEIGHT (inches): 102

****ASF CORRECTION TECHNIQUE
MANUAL WITH CHARTS OR AUTOMATIC WITH TI5000 LORSAT(TM) INTEGRATED NAVIGATION SYSTEM

****NOTCH FILTERS
2 FACTORY PRESET FOR AREA OF OPERATION, 2 USER TUNED FROM FRONT PANEL

****MICRO-PROCESSOR TYPE(S)
TMS 9900

****STATIONS TRACKED & HOW USED
ALL IN CHAIN, DIRECT READOUT OF TD

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
N/A

****DYNAMIC RANGE
90dB, 10uV TO 300mV

****MAX. GDOP FOR LAT-LONG
N/A

****NOISE BANDWIDTH
N/A

****SENSITIVITY (u VOLTS)
N/A

****SNR FOR ACQUISITION
-13dB, -10dB PREFERRED FOR ACCURACY

****SNR FOR TRACK (MIN)
-13dB

****SNR FOR POSITION DISPLAY
N/A

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # TRIMBLE 100A TRIMBLE NAVIGATION
1077 INDEPENDENCE AVE MOUNTAIN VIEW CA 94043

PHONE 415-962-9893

LIST PRICE (USD): 5195.00 01/06/82 ADVERTISED PRICE (USD): 3595.00 00/09/82

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 5 W(inches): 10.8 D(inches): 12.1 VOLUME(cu.in.): 653.4

WEIGHT (lb): 12 TEMP RANGE (deg F): 32,+122

INPUT VOLTAGE: 11-30 POWER REQUIREMENT (Watts): 20

DISPLAY TYPE: 1 LOP LCD 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 6 + SECONDARY ON 16 ANTENNA HEIGHT (inches): 96

****ASF CORRECTION TECHNIQUE
AUTOMATIC via CONDUCTIVITY MAP, N.AMERICAN MEDITERRANEAN. MANUAL CORRECTIONS MAY BE INSERTE
D

****NOTCH FILTERS
4 AUTOMATIC SOFTWARE TUNED HARDWARE

****MICRO-PROCESSOR TYPE(S)
6809/6802

****STATIONS TRACKED & NOW USED
ALL TRACKED, 4TH STATION USED TO RESOLVE AMBIGUITY

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
NONE

****DYNAMIC RANGE
110dB

****MAX. GDOP FOR LAT-LONG
NO LIMITATION

****NOISE BANDWIDTH
UNKNOWN

****SENSITIVITY (u VOLTS)
10uV

****SNR FOR ACQUISITION
-16 TO -20dB

****SNR FOR TRACK (MIN)
-16 TO -20dB

****SNR FOR POSITION DISPLAY
-16 TO -20dB

LORAN-C RECEIVER MANUFACTURERS DATE 02/10/84

MODEL # TRIMBLE 200 TRIMBLE NAVIGATION
1077 INDEPENDENCE AVE MOUNTAIN VIEW CA 94043

PHONE 415-962-9893

LIST PRICE (USD): 00/00/00 ADVERTISED PRICE (USD): 2995.00 01/06/82

DESIGNED FOR: M [(M)arine, (A)ircraft, (S)urvey/monitor, (T)iming, (L)and, (O)ther]

H(inches): 5 W(inches): 10.8 D(inches): 12.1 VOLUME(cu.in.): 653.4

WEIGHT (lb): 12 TEMP RANGE (deg F): 32,+122

INPUT VOLTAGE: 11-30 POWER REQUIREMENT (Watts): 17

DISPLAY TYPE: 2 LOP FLOR. 0-9 KEY PAD? Y

NUMBER AND TYPE OF DATA KEYS: 6 + SECONDARY ON 16 ANTENNA HEIGHT (inches): 96

****ASF CORRECTION TECHNIQUE
AUTOMATIC BASED ON CONDUCTIVITY MAP N. AMERICAN MEDITERRANEAN.

****STATIONS TRACKED & HOW USED
TRACKS ALL STATIONS. AUTOMATIC STATION SELECTION. 3 STATION SOLUTION. USES FORTH TO ELIMINA
TE AMBIGUITY.

****NOTCH FILTERS
FOUR AUTOMATIC. SOFTWARE TUNED HARDWARE NOTCHES

****MICRO-PROCESSOR TYPE(S)
2, 6802 IN TRACKER 6809 FOR NAVIGATION FUNCTIONS.

****MULTI-CHAIN CAPABILITY
NO

****CERTIFICATIONS
NONE

****DYNAMIC RANGE
110dB

****MAX. GDOP FOR LAT-LONG
NO LIMITATION

****NOISE BANDWIDTH
UNKNOWN

****SENSITIVITY (u VOLTS)
10uV

****SNR FOR ACQUISITION
-16 TO -20dB

****SNR FOR ACQUISITION
-16 TO -20dB

****SNR FOR POSITION DISPLAY
-16 TO -20dB

*****MI
LOGO KEY IS A SPECIAL FUNCTION DISPLAY KEY

REFERENCES

[1]L.M. DePalma, et. al., Proceedings of the 10th Annual Technical Symposium, Wild Goose Association, 21-23 October 1981, San Diego.

[2]R.M. Passi, "On Some Aspects of OMEGA Windfinding," Journal of Applied Meteorology, Vol. 14 No. 8, Dec. 1975, pp 1499-1502.