DIGIPLOT®

DIGIPLOT - The World's Most Advanced Automatic Radar Plotting Aid

Iotron's radar processing results in the world's brightest digital radar picture. Superimposed plotted vectors are automatically presented on the display in another, even brighter color. This bright, two-color display is uniquely DIGIPLOT. It is brighter than any conventional marine radar and provides the watch officer with the best possible plotted radar picture.

DIGIPLOT is the only fully automatic radar plotting aid that accepts electrical inputs from any type of radar, gyrocompass, and speedlog. The radar signal is digitized and then analyzed by a patented discriminator which separates ship echoes from receiver noise, sea clutter, and land return by measuring the size of each radar echo. The selection process used is similar to the one used by a ship's watch officer when he is viewing a radar PPI display and deciding which echoes to plot manually. Range and bearing data of the closest 200 ship-sized echoes are continually analyzed and the plotted results of the 20 or 40 closest echoes are displayed with vectors indicating target course and speed in either a true or relative plot. The number of plotted targets depends on the DIGIPLOT model selected. Ship vectors, shown in orange, are non-smearing and are presented on top of a brighter than normal green radar picture. Buoys and other stationary echoes can be immediately identified because their plot has no vector. In contrast, all moving echoes have vectors which indicate the distance travelled in the time interval selected. In true plot the operator can see other vessels' aspect, and in either true or relative plot, the other vessels' maneuvers can be detected shortly after they are begun. The value of seeing all the closest radar echoes simultaneously plotted on the display is that it permits the watch officer to decide for himself, as he does on a clear day, which targets are critical.

DIGIPLOT provides a digital readout of the range and bearing, course and speed, and CPA distance and Time-to-CPA for any target. The desired target is selected by using a joystick to position a flashing marker directly over an echo's position on the display. By selecting a known fixed-point as a target, the values displayed for course and speed provide the "set" and "drift" of own ship. In pilotage waters, range and bearing values of known fixed points can be continuously displayed for direct plotting on a navigation chart.

The real advantage of fully automatic target acquisition and plotting is that minimum operator involvement is required. DIGIPLOT uniquely indicates when a radar echo is first automatically acquired and plotting has commenced. Each target is marked with a small broken circle for 3 minutes to indicate to the ship's watch officer that full tracking accuracy has not yet been achieved. A past history plot of 4 positions over 8 minutes on all tracked echoes can be displayed on demand. DIGIPLOT will give a timely warning of an impending close quarters situation for any desired combination of CPA distance and Time-to-CPA by sounding an audio alarm, showing a flashing red light, and indicating which target violated the alarm settings.

DIGIPLOT provides complete information for rapidly evaluating trial collision avoidance maneuvers and their predicted consequences. For models having the optional dynamic true motion trial maneuver capability, own ship maneuvering characteristics are built-in. The predicted situation during maneuver will be displayed in quick time (which is 30 times faster than the actual maneuver). Trial delay time allows a delayed turn to be displayed.

A built-in static 11 target training display allows for easy familiarization with all DIGIPLOT controls and can be used in port or at sea when there is no need to plot actual radar echoes.

DIGIPLOT incorporates a self check feature which assures that the operator will know when there is a loss of incoming signals from the radar or when internal faults are detected by the self test routine. Routine maintenance and most repairs can be easily performed by the ship's officers. Troubleshooting procedures are fully described in the Operation and Maintenance Manual for repair-by-replacement" of faulty printed circuit boards. In addition, Iotron provides a worldwide service organization of factory trained specialists to perform repairs beyond the capability of the ship's officers.

DIGIPLOT is contained in a sealed console which does not require a special environment. Because it is a single piece of equipment that is easily handled and installed, it can be retrofitted on existing ships during an in-port turnaround. DIGIPLOT's special construction and the use of individually tested solid state electronics in assembly greatly increases the reliability. Every unit is tested at high temperature for 200 hours prior to delivery. Each unit is also vibration tested in full operating condition, which assures the highest operational availability and reduces maintenance and repair. The use of the highest quality electronic components and extensive testing makes it possible for Iotron to offer the broadest extended equipment guarantee in the marine industry. Four and five year guarantees covering all parts and labor are available with the purchase of recommended spares kits.

DIGIPLOT OPTIONS

NAV-LINES (Standard with Model RR)

NAV-LINES use the recognized navigation technique of parallel index lines to insure the safety of a ship in coastal waters without obtaining a conventional fix. Under many conditions this technique is more certain and easier to use. It permits the radar presentation to be used in conjunction with the conventional visual piloting method of establishing a plot of predetermined danger bearings and distances. With the NAV-LINES control, as shown, the watch officer can easily store ten preplanned pairs of charted guidelines in DIGIPLOT memory. These can then be recalled and displayed later with each pair properly positioned and north referenced. The use of parallel index lines as a radar piloting procedure is speeded-up, simplified, and made more accurate. NAV-LINES provide a simple, easy-to-use integrated plotting aid that does not introduce any new methodology that must be learned. It continuously defines safe waters and shows the viewer "where the ship ought to be" and the course to steer to avoid hazards.

DYNAMIC TRIAL MANEUVER (Standard with Model RR)

Dynamic Trial shows the true motion display of a course and/or speed change which includes own ship dynamics. The potential maneuver is observed on the DIGIPLOT display and digital data readout in "quick" time (30 times faster than real time). Setting trial delay time allows display of a turn starting 1 to 9 minutes in the future.

RPM SPEED CONVERTER

This small, rugged, easily installed speed indicator receives its input from the main shaft tachometer. It provides automatic speed readout to bridge personnel and a standard 200 pulse per nautical mile output signal for use with automatic radar plotting aids and radio navigation equipment. The unit can be either mounted separately, as shown, or flush mounted in a ship control console.

ALARMS

FAULT-ALARM
Indicator lights and audio alarm sounds when self check indicates fault.

CPA ALARM
Indicator lights and audio alarm sounds when any target violates CPA/TCPA setting.

RADAR DISPLAY CONTROLS

RADAR SELECT
For choosing display of normal video or quantized video.

BRILLIANCE
For setting radar sweep intensity.

VIDEO GAIN
For setting received radar video signal strength.

RANGE RING BRILLIANCE
For controlling brightness of range rings.

HEADING MARK
To momentarily suppress the dashed heading line.

DISPLAY

A standard PPI picture is displayed. Acquired targets are shown by small circles over each ship-sized radar echo. On true plot, moving targets have vectors whose direction indicate course and predicted future position. On relative plot the vectors show target relative motion in relation to own ship. Own ship position is shown with a small circle and vector in the center of the display. An own ship's heading mark indicator and a dashed radar heading mark line are provided. A crossed line on the heading mark indicator, like a plus sign, shows the computer saturation when occurring and the requirement for anticlutter.

ACQUISITION SELECT
For choosing automatic/manual acquisition or manual acquisition only.

ANTI-CLUTTER
For reducing and eliminating sea clutter.

DISPLAY ILLUMINATION
For setting target vector intensity.

PANEL ILLUMINATION
For controlling switch and panel nomenclature lighting.

HISTORY
For showing past positions of all tracked targets.

MINIMUM ACQUISITION RANGE
For setting desired minimum automatic target acquisition range.

LOST TARGET

ALARM/DELETE
Button flashes and there is 30 second visual alarm when tracked target is lost. Delete allows alarm to be disabled.

CPA ALARM CONTROLS

CPA DISTANCE
For setting Closest Point of Approach (CPA) distance for alarm.

TIME TO CPA
For setting Time-to-CPA for alarm.

AUDIO OFF
Turns off audio alarm. CPA alarm indicator lights and alarming target or targets are visually indicated until they no longer violate the alarm settings.

An audio alarm and CPA alarm light are automatically activated based on a comparison of computed CPA and Time-to-CPA with control limits set by the operator. This computation and comparison is performed for every target on each radar scan.

GYRO SET
For setting initial gyr
heading is set on TR
wheel prior to pressi

TRIAL MANEU

TRIAL DELAY
For setting trial delay
Model RR.)

TRIAL SPEED
For setting trial mane

TRIAL COURSE
For setting trial mane

STATIC/DYNAMIC
For choosing type o
sentation.

TRIAL
For displaying trial m

yro input. The ship's
TRIAL COURSE thumb-
sing button.

UVER CONTROLS

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neuver speed.

neuver course

of trial maneuver pre-

maneuver situation.

INPUT SPEED
For choosing automatic or manual speed input.

SHIP'S SPEED
For setting own ship's speed.

VECTOR DISPLAY CONTROLS

MODE
For choosing North-up or Ship's Head-up.

PLOT
For choosing True or Relative vectors.

RANGE MILES
For choosing display scale of 3, 6, 12, or 24 miles.

VECTOR LENGTH - MINUTES
For adjusting vector length from 0 to 69 minutes. The circle on each echo and own ship indicates present position. Vector length indicates the projected future position for the selected time.

POWER
Circuit breaker to turn equipment ON/OFF.

LINE CONTROL

Line rotation and translation controls position two separate limit lines on the display. These two lines eliminate automatic and manual acquisition and plotting in selected areas and reduce spurious targets due to land radar echoes.

TARGET SELECTOR

ACQUIRE/DELETE
For manually acquiring or deleting targets selected using the joystick.

TAG/MARK
Tag provides for reading range and bearing, course and speed, and CPA/TCPA of a target selected using the joystick. Mark provides for navigation point auto-positioning (Man Overboard position indication) and reading range and bearing and CPA/TCPA of any fixed point using the joystick.

TARGET & OWN SHIP DATA
Digital Data Readout of selected pairs of target data *Range and Bearing, Course and Speed, CPA and TCPA* or own ship *Course and Speed.*

JOYSTICK
For positioning of flashing symbol on the display.

TARGET
For choosing the digital readout of selected data on any target.

OWN SHIP
For choosing the digital readout of own ship's course and speed.

NAV-LINES

ON/OFF
For displaying navigation lines.

DIRECTION
For setting direction of each selected pair of navigation lines.

RANGES
For setting range of each selected pair of navigation lines.

LINE SELECTOR
For selecting any one or two pairs of navigation lines from a total of ten pairs.

DIGIPLOT incorporates over ten years of evolutionary development and continuous improvement derived from extensive use at sea. Nothing has been spared to make DIGIPLOT the best ARPA available.

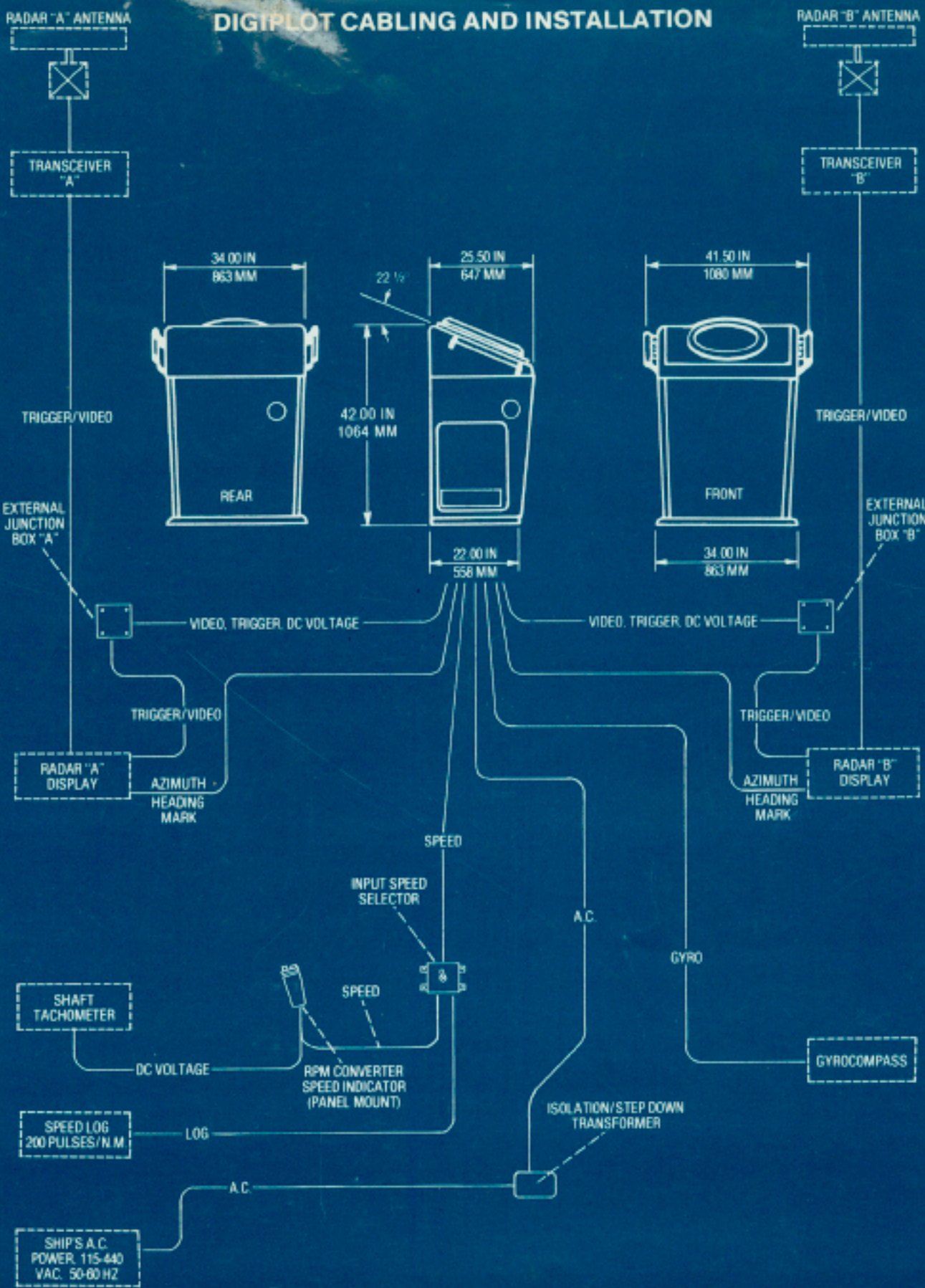
Unique DIGIPLOT features:

- **OPERATES WITH *ANY* MANUFACTURER'S MARINE RADAR** - eliminates the cost of replacing radars.
- **FULLY AUTOMATIC *'HANDS OFF'* TARGET ACQUISITION** - eliminates *operational limitations of fixed and variable Guard Rings.*
- **TRACKS AND DISPLAYS UP TO 40 TARGETS SIMULTANEOUSLY**-Target capacity depends on model selected.
- **SYSTEM CAN BE USED IN CONFINED WATERS** - target acquisition, tracking, and plotting accuracy not affected by *number of echoes on the same bearing.*
- **BRIGHT TWO-COLOR PPI DISPLAY** - eliminates confusion between radar echoes and vectors.
- **PROVIDES A BACK UP RADAR DISPLAY** - increases radar availability and operational safety.
- **SIMPLE TO OPERATE** - dedicated radar type controls greatly reduce operator training requirements.
- **COMPUTER CONTROLLED CLUTTER REJECTION** - for target tracking at close range.
- **SUPERIOR NOISE REJECTION** - three pulse correlated quantized video.
- **COMPLETELY TIME VARIABLE TRUE AND RELATIVE VECTORS** - allow easy determination of points of possible collision.
- **CONTINUOUS DIGITAL TARGET DATA READ-OUT** - no interruptions due to own ship or target maneuvers.
- **STATIC AND DYNAMIC TRIAL MANEUVER CAPABILITY** - including own ship's maneuvering characteristics.
- **AUTO-POSITIONING NAVIGATION MARK** - continuously indicates a "marked" geographic position for man overboard and set and drift determination when piloting.
- **'BUILT-IN' TRAINING DISPLAY** - for easy on-board operator training.
- **OPTIONAL NAV-LINES FOR ANTI-STRANDING** - simple, operator controlled, pre-planned parallel index navigation lines.
- **GUARANTEE** - covers all parts and labor for one year after installation. Extended guarantee up to five years with purchase of recommended spare parts.
- **EXPANDS TO A *FUEL SAVING* INTEGRATED BRIDGE SYSTEM** - with the addition of **DIGIPILOT/DIGINAV** fully adaptive autopilot and automatic navigation system.

DIGIPLOT MODEL RR ARPA

ALL DIGIPLOT Models comply with U.S. Department of Commerce MARAD Collision Avoidance System Specifications for Merchant Ship Construction and are Guaranteed to fully meet U.S. Coast Guard regulations issued in compliance with U.S. Public Law 95-474 and IMCO Performance Standards for Automatic Radar Plotting Aid.

DIGIPLOT CABLING AND INSTALLATION



iotron

SYSTEMS DESIGNED FOR SAILORS

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