

S_R MARINER

NAV-5A

INSTALLATION INSTRUCTIONS

Congratulations in choosing a high performance marine instrument and welcome to the growing family of SR Mariner product owners. Since our establishment in 1973, we have engineered our products to give you quality at a reasonable price.

To familiarize yourself with all the features and installation procedures please read the following instructions carefully.

If you still have any questions or comments please call your nearest dealer or call the factory at (716)693-5977 or write:

SR Instruments
600 Young Street
Tonawanda, NY 14150
Attn: Service Department

Before proceeding, please check for all necessary parts:

- | | | | |
|---|-----------|---|---|
| 1 | NAV-5Ast | - | main station |
| 1 | NAV-5Acdd | - | cockpit display or remote |
| 1 | CM-10 | - | combination mast unit |
| 1 | DT-10 | - | depth transducer |
| 1 | TR-10 | - | knot/log transmitter |
| 1 | C6507 | - | 65 foot-7 conductor cable with 2 connectors |
| 1 | C3507 | - | 35 foot-7 conductor cable with 1 connector |
| 1 | C3503 | - | 35 foot-3 conductor cable with 1 connector |
| 2 | TH-1 | - | thru hull fitting |
| 2 | DP-1 | - | dummy plug |
| 1 | ICW-5 | - | instrument cover for cockpit display |

IMPORTANT

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It is recommended that you temporarily hook up your SR MARINER equipment before installation so that you become familiar with its connections and system performance. **DO NOT CUT ANY CABLES**, but connect according to wiring diagram (fig.1). As you go through the steps, *be sure to verify functions and readings at both the station and cockpit*. See OPERATIONS for detailed modes and functions:

1. Press the SPEED button on the station to display reading. Spin the paddle wheel and the reading will be displayed.
2. Press the LOG button and continue spinning the paddle wheel until the log registers on station and cockpit.
3. Press the DEPTH button. Put the transducer over the side of the boat or in a pool of water (min.3-4 feet). If both the station and cockpit DEPTH displays read the same and is accurate, then adjust the alarm settings to set off the buzzer in the station and cockpit (details to operate alarms are found in OPERATIONS under ALARM).
4. Press the WIND button. Spin the cups of the mast unit and verify readings on both the station and cockpit WIND display.
5. Press the CLOSE HAUL button to turn off automatic closed haul and turn the wind vane through the full range scale. If that is good, then depress the button again to turn on the closed haul and slowly turn to 60 degrees (port then starboard) and lower case 'c' will indicate closed haul mode and the pointer will go to the blue inside scale and read 60 degrees. Rotate to 0 degrees and then check the other side.

If all functions perform satisfactorily, proceed with installation. If the system fails to perform, check all connections. If system still fails to perform check with your dealer for advice and/or replacement if needed.

I. DESCRIPTION OF THE NAV-10 SYSTEM

A. STATION - 8.5" x 5.0" x 2.0"

1. FUNCTIONS:

- a. A dot matrix display that can be switched to monitor water speed, log, wind speed, wind direction, or depth.
- b. Audible alarms for shallow and deep water.
- c. Speed - The ship's current speed through the water.
- d. Log - A permanent log of distance covered and a resettable log.
- e. Apparent wind speed - Wind speed as seen on the boat.
- f. Apparent wind direction - 360 degree digital display of the wind direction.
- g. Depth - Water depth displayed in feet, fathoms, or meters.

2. CONTROLS - The station has buttons that can toggle through all the functions and:

- a. Power on-off switch.
- b. Light control to adjust from minimum to maximum brightness or to off.
- c. Averaging controls for water speed, depth, wind speed, and apparent wind.
- d. Depth alarm set and audible alarm for shallow and deep.
- e. Apparent Wind - Closed Haul automatic switch.
- f. Reset for the trip log.

3. ADJUSTMENTS:

- a. Knots and log calibration.
- b. Apparent Wind calibration.
- c. Wind speed calibration.
- d. Depth gain adjustment.
- e. Depth keel offset adjustment.

B. COCKPIT DISPLAY - 12.0" x 5.5" x 1.0"

1. FUNCTIONS:

- a. Four multi-functional digital readouts and one analog pointer for a 360 degree display of apparent and true wind direction as well as a closed haul indicator.
- b. Speed - the ship's current speed through the water.
- c. Logs - a permanent total and a resettable.
- d. Wind speed from 0 to 75 kph (or mph).
- e. Depth from 2 to 300 feet (or converted to meters or fathoms) with audible alarms.

C. TECHNICAL DATA

1. POWER REQUIREMENT is 12VDC with:

- a. .5 amps with full intensity lighting
- b. .2 amps with lights off

2. SENSORS

- a. Depth transducer - 160 kilohertz(KHZ)
- b. Speed transmitter - 14400 pulses per nautical mile

II. INSTALLATION

A. NAVIGATIONAL STATION

The navigational station may be mounted on any convenient vertical bulkhead. It should be placed so that its connectors, switches, and calibration adjustments are accessible. Mount it using the dimensions or the template provided.

B. COCKPIT DISPLAY

1. Bulkhead Mounting:

Drill two 5/16" holes and one 3/4" hole according to measurements or the template drawing. Bolt the display with the 1/4" nuts and flat washers provided. Caulking should not be necessary unless the surface is curved or uneven.

2. Pedestal Mounting:

The factory stocks pods for the cockpit display if you choose to mount on a pedestal. The cable harness connector will pass through the inner diameter of the 1"OD tubing used with these pods.

C. SPEED AND DEPTH TRANSDUCERS:

The preferred position is where water is diverging around the hull and is free from turbulence and eddies. This is generally in the forward one-third of the hull in front of the keel and approximately one foot off the centerline. Generally the knot meter transmitter can be mounted on one side of the keel with depth transducer in a similar position on the opposite side of the keel. If due to access considerations, it is necessary to locate the depth transducer and knot meter transmitter on the same side on a fore and aft line, be sure to locate the depth transducer in front so that the turbulence created by the paddlewheel does not interfere with the depth sensor.

The depth transducer should be installed in a fairly flat area where degree of angle does not exceed 20 degrees. An alternate location is along side the keel two feet off the keel, ahead of amidships.

The thru hull fittings require a 2 1/8" hole with a 30 degree flange. SR Mariner provides a tool (THT) that drills and flares this hole in one operation. If this tool is not available locally contact the factory and arrangements can be made to rent one.

NOTE: MAXIMUM HULL THICKNESS FOR THRU HULL FITTING IS 1-1/4"

1. Thru the Hull:

Choose the location of the sensors and cut your holes for the thru-hull fittings. File a notch **FACING FORWARD** to seat the key way. The key way ensures proper orientation of the sensors for use and/or maintenance. After proper fit is secured, place bedding compound around the lip and body of the fitting where it will be in contact with the hull. Insert the thru-hull fitting and tighten the fitting nut by using a spanner wrench or a tap with a small wooden block against the nut to provide a snug fit. DO NOT OVER TIGHTEN!

2. Cemented to the Hull (for DEPTH ONLY):

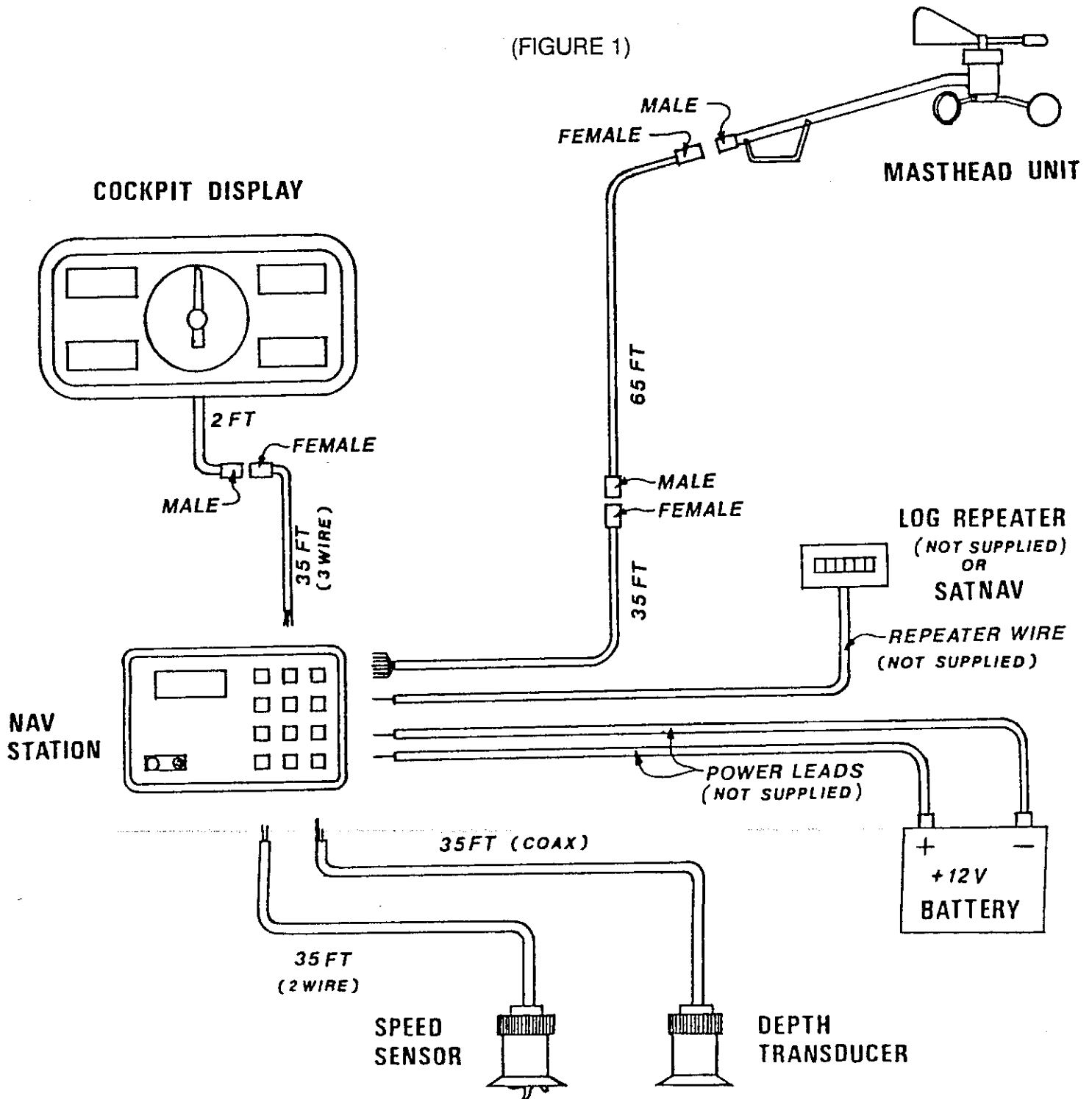
If your primary importance is for shallow water monitoring, the transducer may be cemented to the hull, thereby eliminating a hole through the hull. The position selected must not have airvoids, balsa fillers, etc. It is best to choose a location and make a small putty dam and fill it with water and put your transducer in it to see if a stable depth is indicated. At this point back off on the gain until reading becomes unstable to see how much reserve gain is available. Compare this gain setting with the transducer hung overboard: this will give an approximation of attenuation at the chosen location. If operation is suitable, clean the surface of the transducer with lacquer thinner to remove the anti-fouling paint. Clean the hull to remove grease and mold release. The transducer may be cemented with epoxy or fiberglass resin (stir the epoxy slowly). **THERE SHOULD BE NO AIR BUBBLES IN THE ADHESIVE BOND.**

D. MAST UNIT:

Mount the base for the mast unit assembly with four screws so that the mast pipe will point straight toward the bow. Run the free end of the 65 foot cable down or through the mast and splice it to the 2 foot length cable. It is preferred to solder the connections and use heat shrinkable sleeving, but if not convenient, use the crimp connectors provided. This will connect to the 4 pin plug of the cable harness also allowing a quick disconnect so you can unstep the mast.

NOTE: When the mast unit can not be mounted with pipe pointed forward, then the vane can be readjusted for other angles as follows- set the position of mast unit and then loosen the two set screws in the wind vane and remove vane. Turn the potentiometer shaft until the display reads 180 degrees. Carefully install vane pointing straight aft and tighten set screws. Check display for 10 and 90 degrees on port on starboard. If satisfactory, put Loctite or equivalent on set screws.

NOTE: THE CABLES MAY BE ALTERED TO ACCOMODATE INDIVIDUAL NEEDS EXCEPT FOR THE DEPTH CABLE.



III. OPERATION

A. MODES - The navigational unit contains four mode selection buttons; SPEED, LOG, WIND, and DEPTH. These buttons allow the user to step through each of the functions of the unit (the cockpit depth will display the proper mode of reading as the station does).

PRESS	DISPLAY	DESCRIPTION
SPEED	SPEED 5.6	The boat speed display is shown in 1/100 knot
LOG	LOG 124.7	The display shows the permanent log at 124.7 miles
LOG	TRIP 20.3	The display now shows the resettable log at 20.3 miles
WIND	AW SPEED 12	The display shows the apparent wind speed at 12 knots
WIND	APP WIND S 38	The display now shows the apparent wind direction at 38 degrees starboard
DEPTH	DEPTH FT 11.7	The depth display shows the current depth in feet
DEPTH	DEPTH M 31.3	The display now shows the current depth in meters
DEPTH	DEPTH FA 17.1	The display now shows the current depth in fathoms

B. ALARMS - The shallow alarm can be toggled on or off using the SHAL. ALARM button. The deep alarm uses DEEP ALARM. While in either alarm mode, the value can be set using the the SET button to initiate the process, then using the up/down arrow buttons.

SHAL. ALARM	SHAL OFF M 5.5	The display shows the shallow alarm is off, but set at 5.5 meters. Let's change that to feet first
DEPTH	DEPTH M 15.7	The depth meter is showing 15.7 meters of water. Now toggle through the modes
DEPTH	DEPTH FA 8.6	The depth meter is now showing 8.6 fathoms of water
DEPTH	DEPTH FT 51.6	The depth meter is now in feet. Let's go back to the shallow alarm
SHAL. ALARM	SHAL OFF FT18.0	The display shows the shallow alarm is off, but set at 18.0 ft. Notice that re-entering the shallow alarm mode did not toggle the on/off switch
SHAL. ALARM	SHALLOW FT18.0	The display shows the shallow alarm is now on and set at 18.0 feet
SET	SHALLOW FT18.0	The display shows the shallow alarm is still set at 18.0 feet. But we can now change the value
↑	SHALLOW FT18.1	Pressing the up or down arrow after SET causes the value to change. But only for values which can be changed (ie. not the log)
↑	SHALLOW FT20.0	Holding the up or down arrow button after set causes the value to keep changing to the desired value. The set mode will be exited when you press any button but the up or down arrow or SET button

C. AVERAGING - Each of the primary functions (SPEED, AWS, AW, and DEPTH) have an averaging period which can be varied to help make the displays fluctuate less.

PRESS	DISPLAY	DESCRIPTION
DEPTH	DEPTH FT 51.5	The display is now in the depth mode
AVG	DEPTH AVG 26 SEC	The depth meter averaging is 26 seconds. Let's reduce that
↑	DEPTH AVG 25 SEC	The depth meter averaging is now 25 seconds. Let's reduce that some more
↑	DEPTH AVG 15 SEC	Again by holding the up or down arrow button, the value will continue to be changed. You can leave this mode by pressing another button

D. RESET - The trip log can be reset by selecting the function and then pressing the button marked SET.

LOG	LOG 195.2	The display shows the permanent log at 195.2 miles
LOG	TRIP 78.4	The display now shows the resettable trip log at 78.4 miles
SET	TRIP 0.0	The trip is now reset and will count up from zero

E. AUTO CH - Pressing the CLOSE HAUL button will expand the analog wind direction pointer 3:1 in the range 0 to 60 degrees. When the scale is expanded a lower case 'c' will appear in the wind speed digital display of the cockpit. Pressing the close haul button again will turn off this function.

AUTO C.H.	CLOSE HAUL OFF	The display shows the automatic close haul is off
AUTO C.H.	CLOSE HAUL ON	The display now shows the automatic close haul is on

5. LIGHTS - The lights can be turned on or off using the LIGHTS button. The intensity can be changed by using SET and the arrow buttons while in the lights mode. (There are 7 intensities and off).

LIGHTS	LIGHTS OFF	The display shows that the lights are off
LIGHTS	LIGHTS ON 4	The display now shows the are on and at intensity 4

IV. CALIBRATION

The system is calibrated at the factory, however individual hull design, sensor placement, etc. may require slight readjustments for best accuracy. These adjustments are accessible behind the plastic plug on the top of the navigational station and using the potentiometers on the bottom or the proper buttons on the front.

A. LOG AND KNOTMETER: These units are calibrated together.

1. LOG - Probably the easiest way to calibrate the knot meter and log is to cover a measured distance, using charts or a LORAN to obtain the measure.
 - a. Remove the plastic cap on the *upper right hand corner* of the navigation station to allow access to the *calibrate switch* (CAL switch).
 - b. Enter the trip log mode using the LOG button.
 - c. Reset the trip log by using SET.
 - d. Cover the measured distance (a mile is good).
 - e. Press the CAL button (use the eraser of a pencil to press it).
 - f. Press and hold the up or down arrow button until the reading is the value it should be then release the arrow button. The log and knot meter are now set.
2. SPEED - The knot meter and log can also be set by using the speed mode. It is recommended that you use the motor on a calm day to get a smooth reading.
 - a. Uncover the CAL switch in the upper right hand corner of the station.
 - b. Enter the SPEED mode using the SPEED button.
 - c. While under way, press the CAL switch to enter the calibrate mode.
 - d. Use the up or down arrow buttons to adjust the speed to the proper value then release the arrow button. The log and knot meter are now calibrated.

NOTE: The use of high averaging values (40-60 sec) will make the job easier.

B. WIND: The wind functions are best calibrated on a calm day while under power. This ensures that the wind is less variable.

1. APPARENT WIND - While under power on a calm day:

- a. Uncover the CAL switch in the upper right hand corner of the station.
- b. Go to the speed mode by using the SPEED button and note the ship's speed.
- c. Go to the *apparent wind speed* mode by using the WIND button.
- d. Press the CAL switch using a pencil eraser.
- e. Change the value of the wind speed using the up/down arrow buttons to match boat speed.
- f. Release the arrow button and press WIND again to get to the *apparent wind direction*.
- g. Press the CAL button again to enter the CAL mode.
- h. Use the up/down arrow buttons to bring the wind direction to zero degrees (since we are making our own wind).
- i. Leave the CAL mode by pressing any button except the CAL or arrow buttons.

C. DEPTH: The best way to set the depth is by measuring with a weighted line near the point where the transducer is mounted.

1. CALIBRATION:

- a. Uncover the CAL switch.
- b. Enter the DEPTH mode - preferably the feet mode.
- c. Measure the depth with a lead line.
- d. Subtract keel length if you desire to have the depth measured from the keel.
- e. Press the CAL switch and use the up/down buttons to set the proper value.
- f. Leave the CAL mode by pressing any other button than up, down or CAL.

2. ADJUSTMENTS: If you are experiencing problems with the depth reading, there are two adjustments that can be made - the Shallow Gain Control and the Gain Control. ADJUST ONLY IF A PROBLEM EXISTS!

- a. Shallow Gain: When the transducer sends out its signal, it can receive a reflection from the keel, pilings, and other nearby objects before the reflection from the bottom. To eliminate the returns from these unwanted signals, the SHALLOW GAIN must be adjusted. For best results, start in 10-15 feet of water and turn the SHALLOW GAIN clockwise until the readings are substantially less than the actual depth. Now turn back counter clockwise until the readings return to the actual depth. Repeat this procedure while under way.
- b. Gain: The gain control is a manual override on the automatic gain control and is used to set the maximum gain. This control should be maximum clockwise initially. Sometimes electrical disturbances, turbulence or spurious reflections from the keel may cause unstable readings. If this occurs then turn the gain control counter clockwise slightly until the readings stabilize.

V. SERVICE:

A. SENDING UNITS: All units can be removed while the boat is in the water.

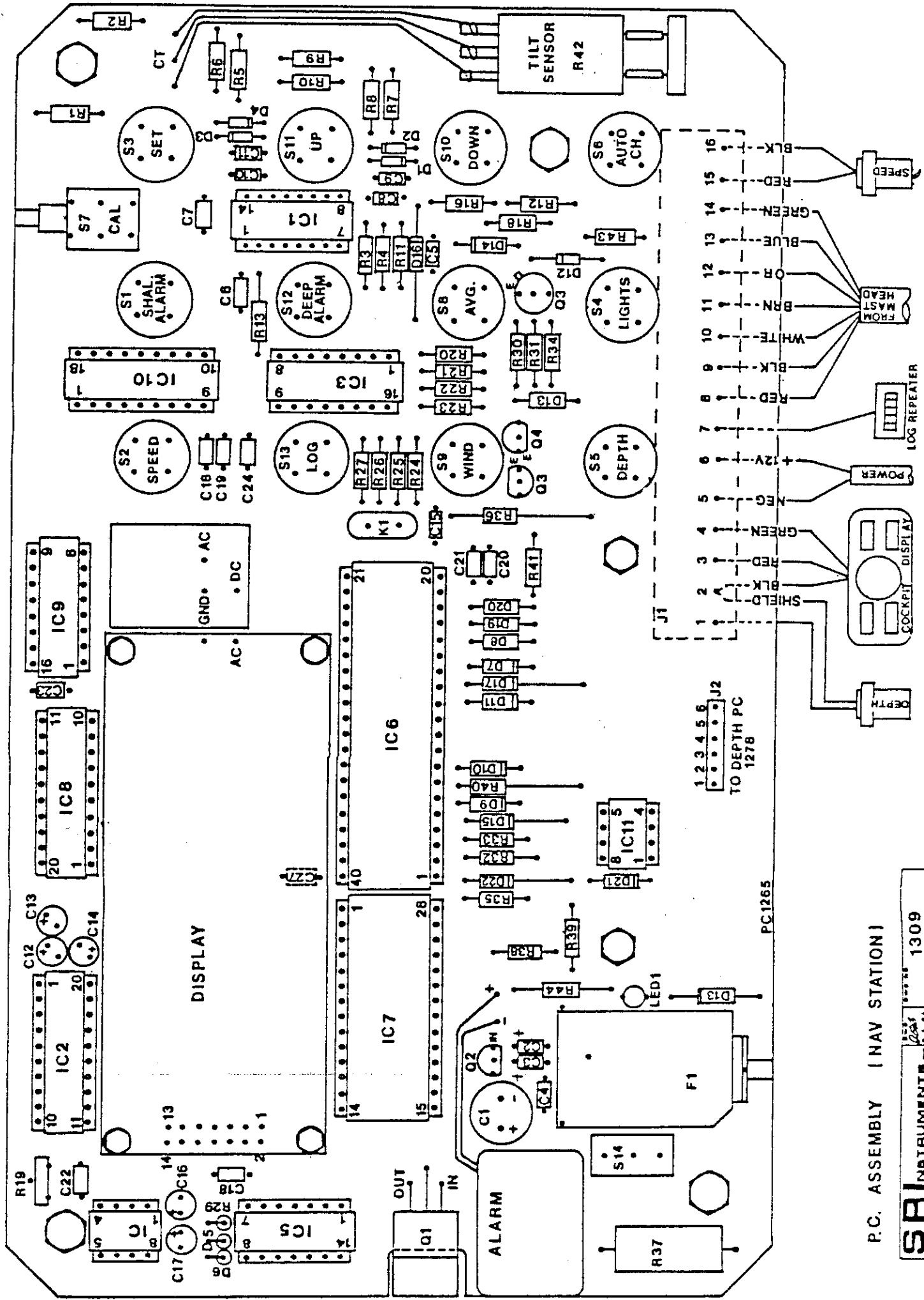
- 1.DT-10: The face of the transducer must be kept clean and have ONE coat of anti-fouling paint if installed thru-hull. To remove old paint use a lacquer thinner instead of abrasives or sand blasting otherwise you can damage the transducer.
- 2.TR-10: The paddle wheel should be clean and free of any growth. If it is necessary, a thin coat of anti-fouling paint can be applied to the paddle wheel and inside housing. This should keep off growth while not deterring the performance of the unit. Also to maintain good operation, lubricate the paddle wheel should be lubricated at least once a year.
- 3.CM-10: It is recommended to remove the mast unit when the boat is put in for storage, however it is not always convenient to do so, therefore cover the unit to protect it from the harsh elements.
The generator requires periodic lubrication, depending upon use and environment. We recommend a Teflon based lubricant.

If any problems or inquiries, please contact the factory at:

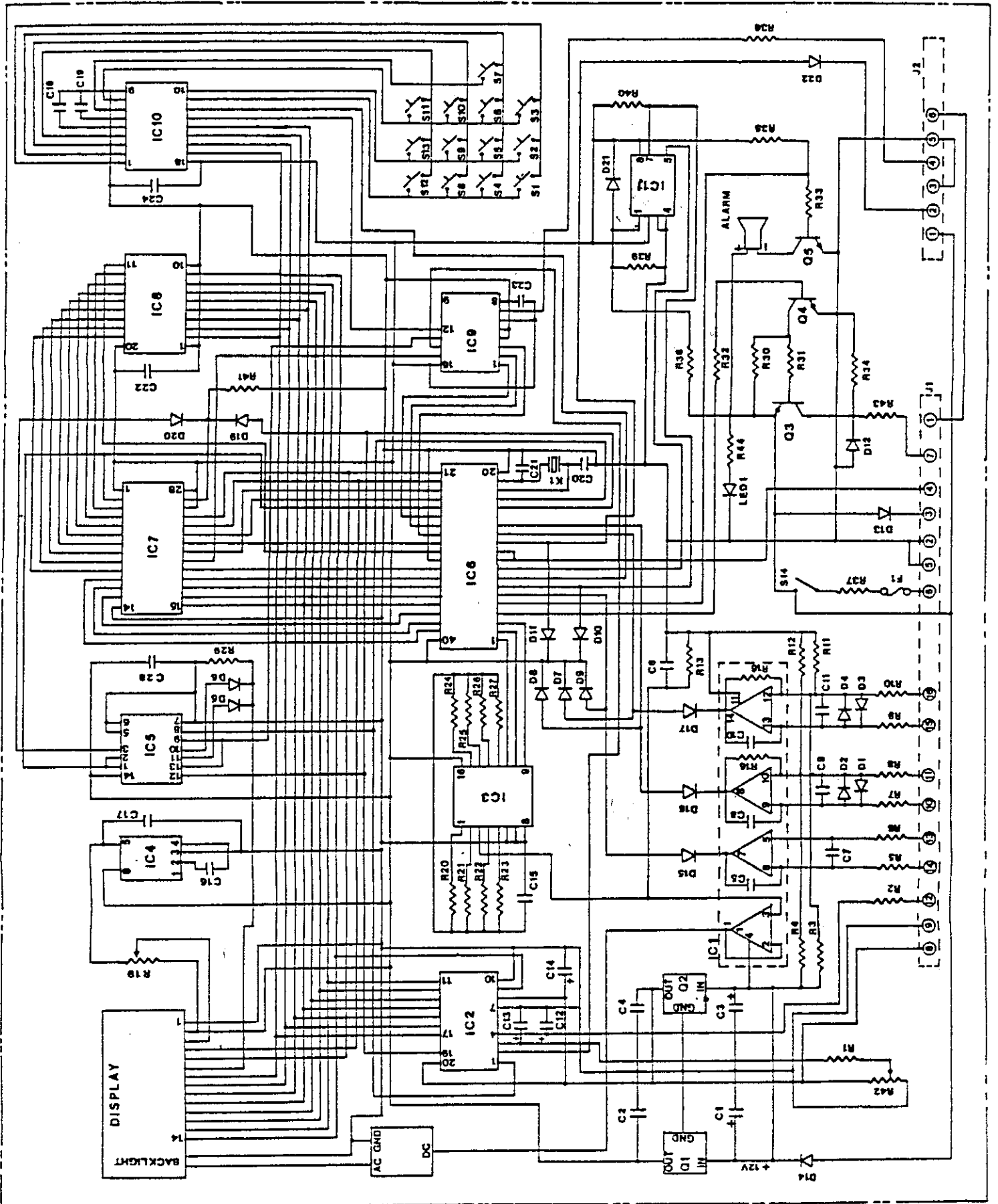
SR Instruments
600 Young Street
Tonawanda, NY 14150
(716)693-5977

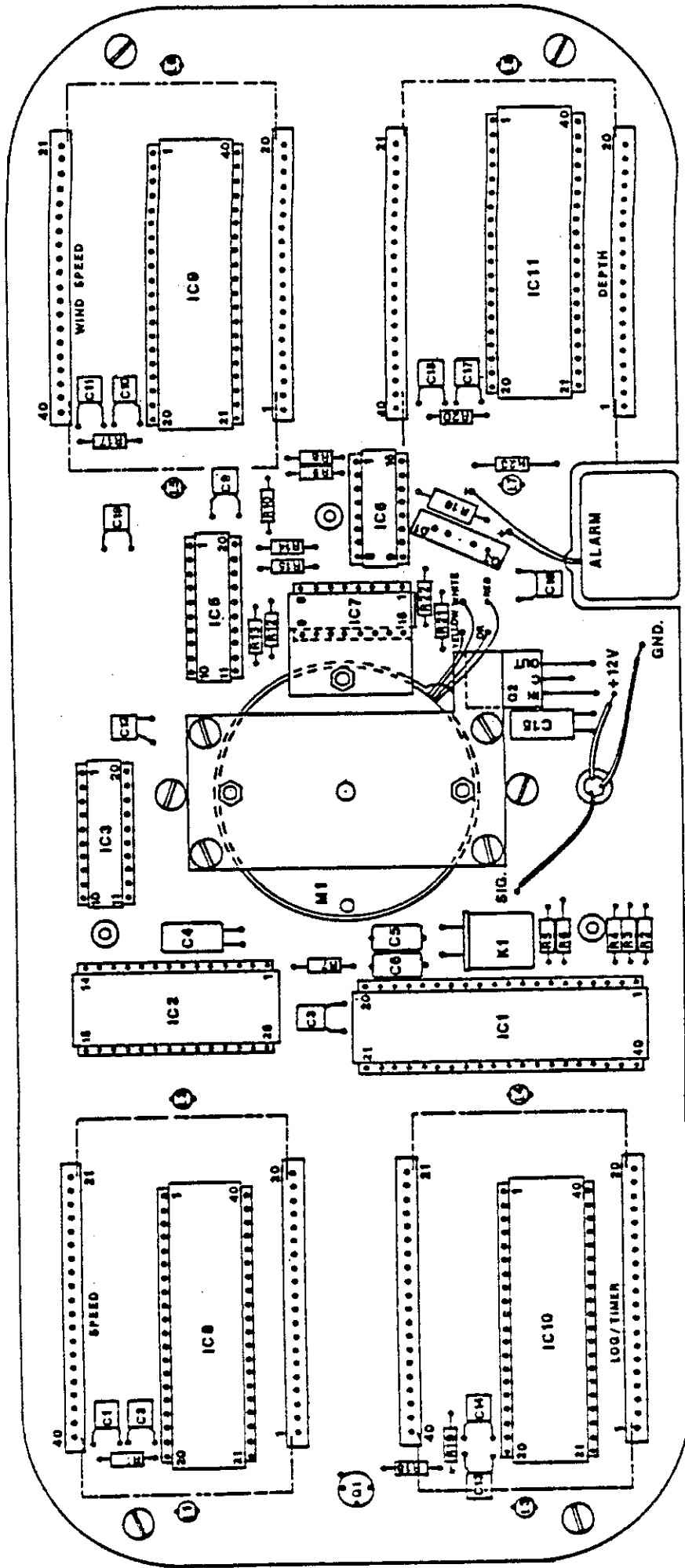
ACCESSORIES

WV	WIND VANE
122-123	1K POT FOR MAST UNIT
ICW-5	INSTRUMENT COVER FOR COCKPIT DISPLAY
AC	ANENOMETER CUPS AND HARDWARE
AG	ANENOMETER GENERATOR
CM-10	COMBINATION MAST UNIT
DT-10	DEPTH TRANSDUCER
TR-10	SPEED TRANSMITTER
TR-1R	IMPELLER AND PIN
TH-1	THRU HULL FITTING
DP-1	DUMMY PLUG



P.C. ASSEMBLY (NAV STATION)



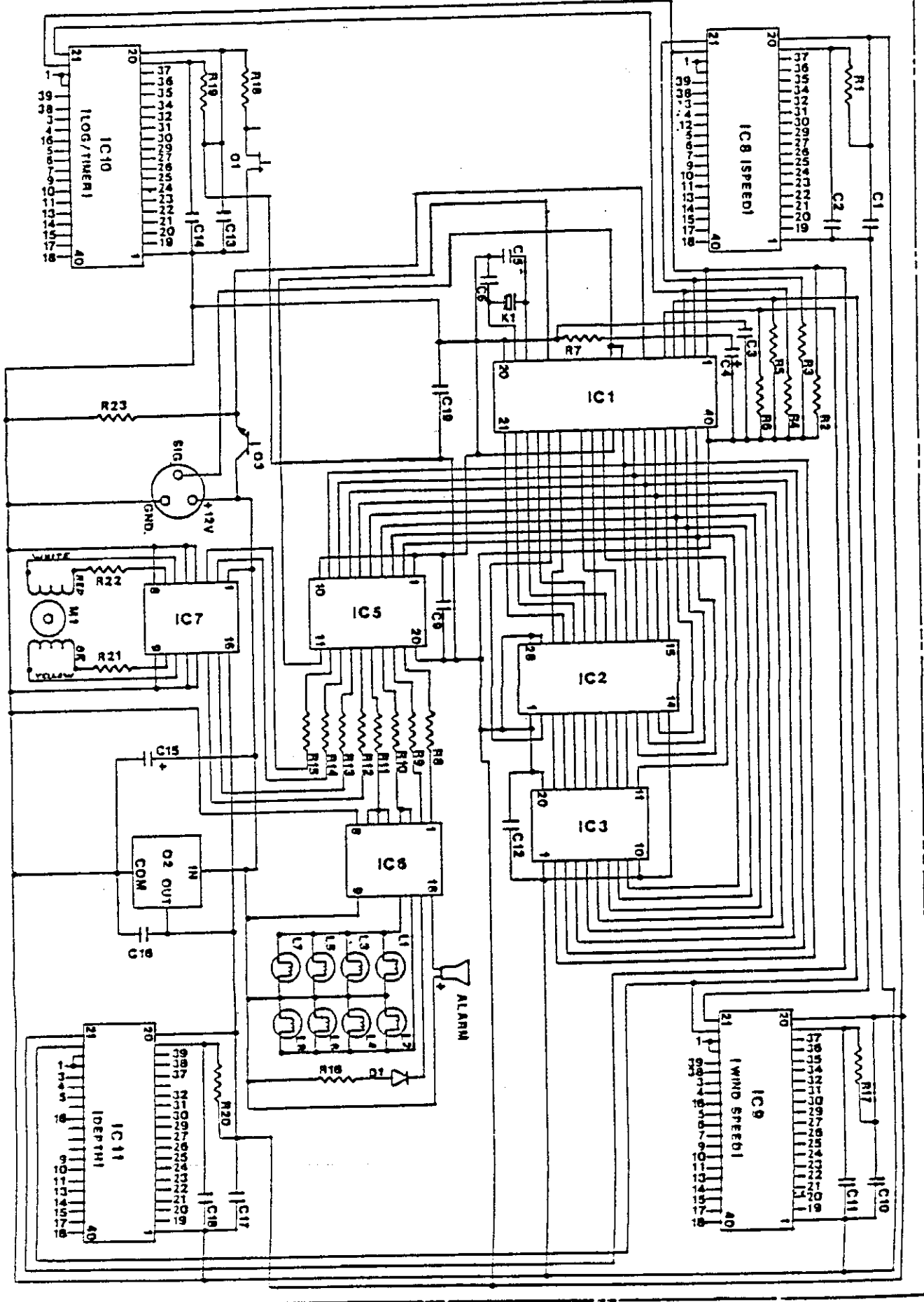


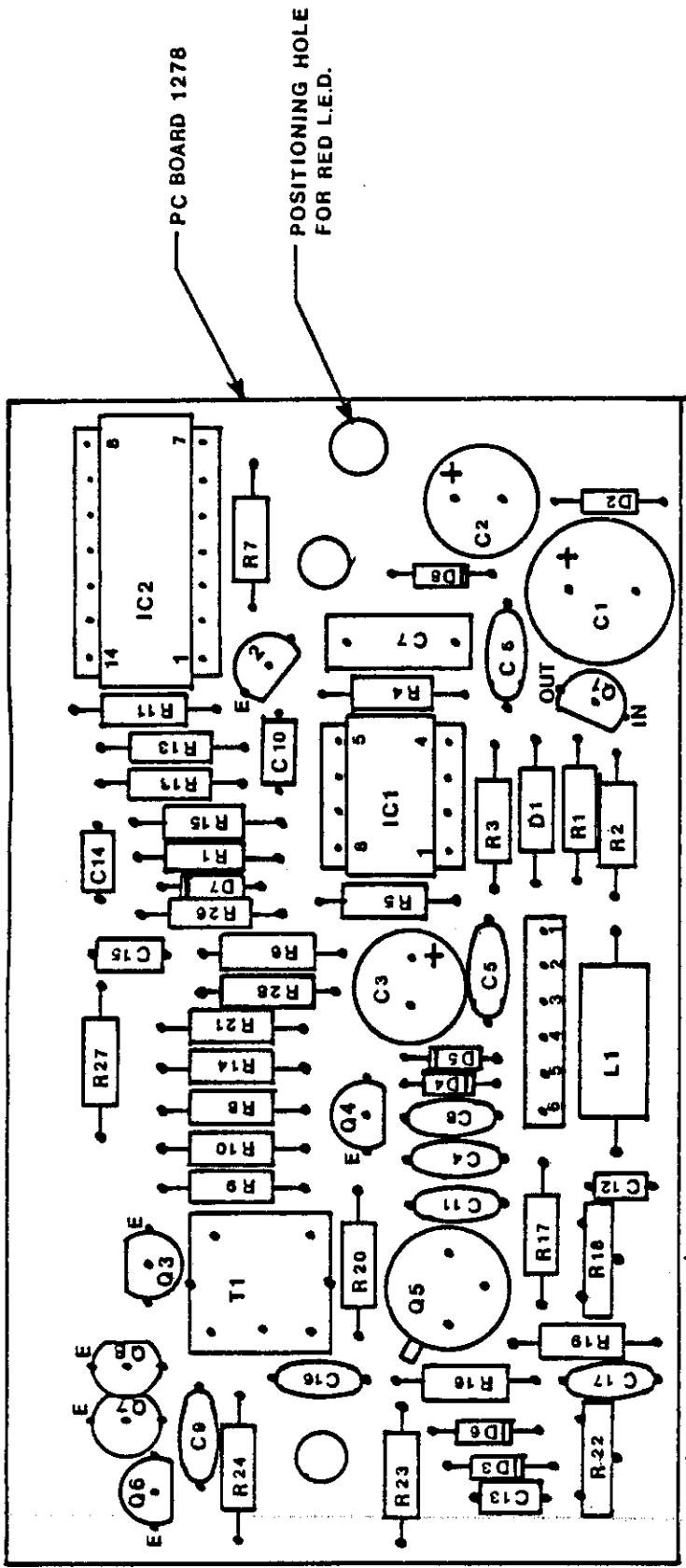
NAV - 5A

SRI INSTRUMENTS INC. 1312

PC ASSEMBLY (COCKPIT DISPLAY)

PC 1233



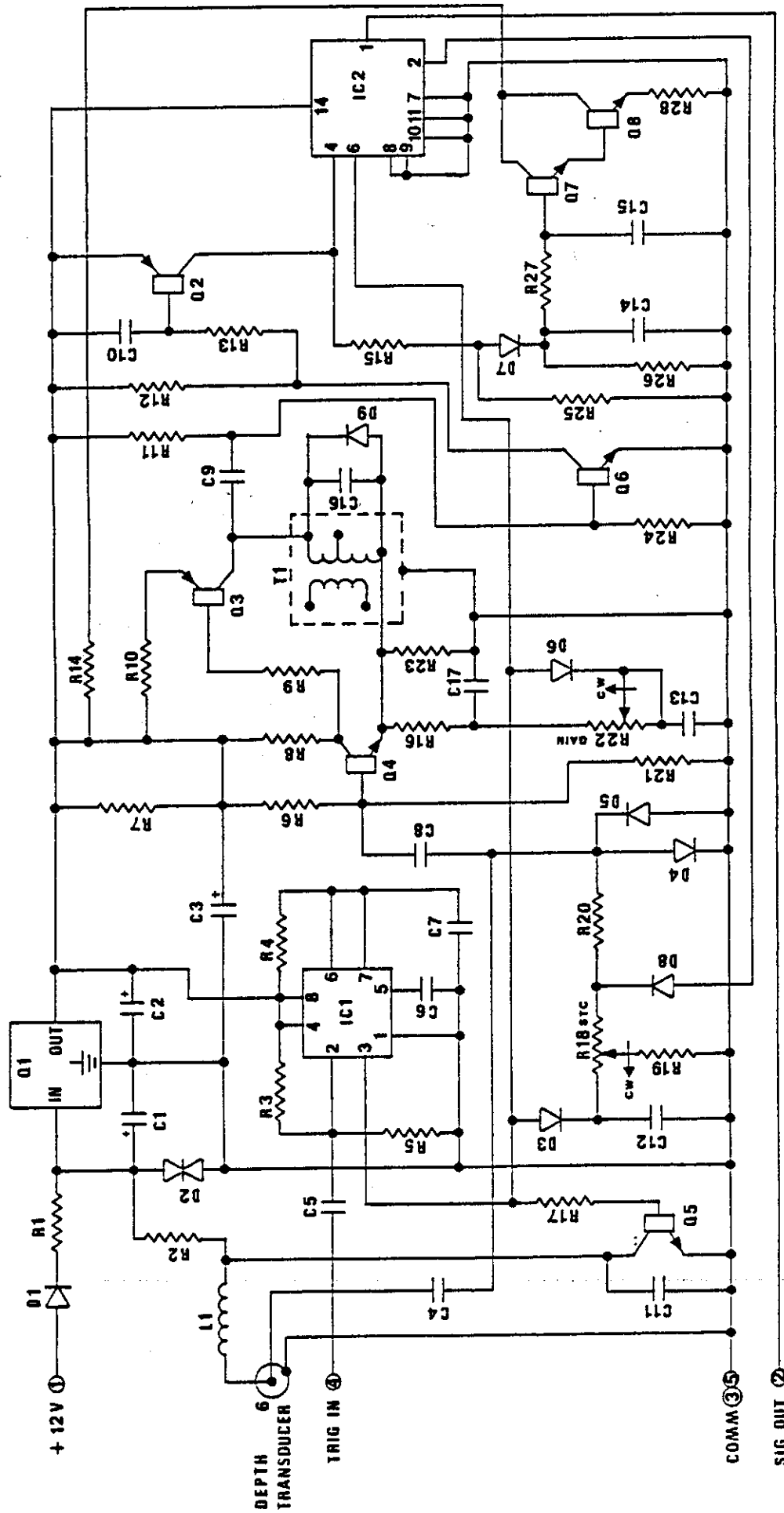


PC BOARD 1278

POSITIONING HOLE FOR RED L.E.D.

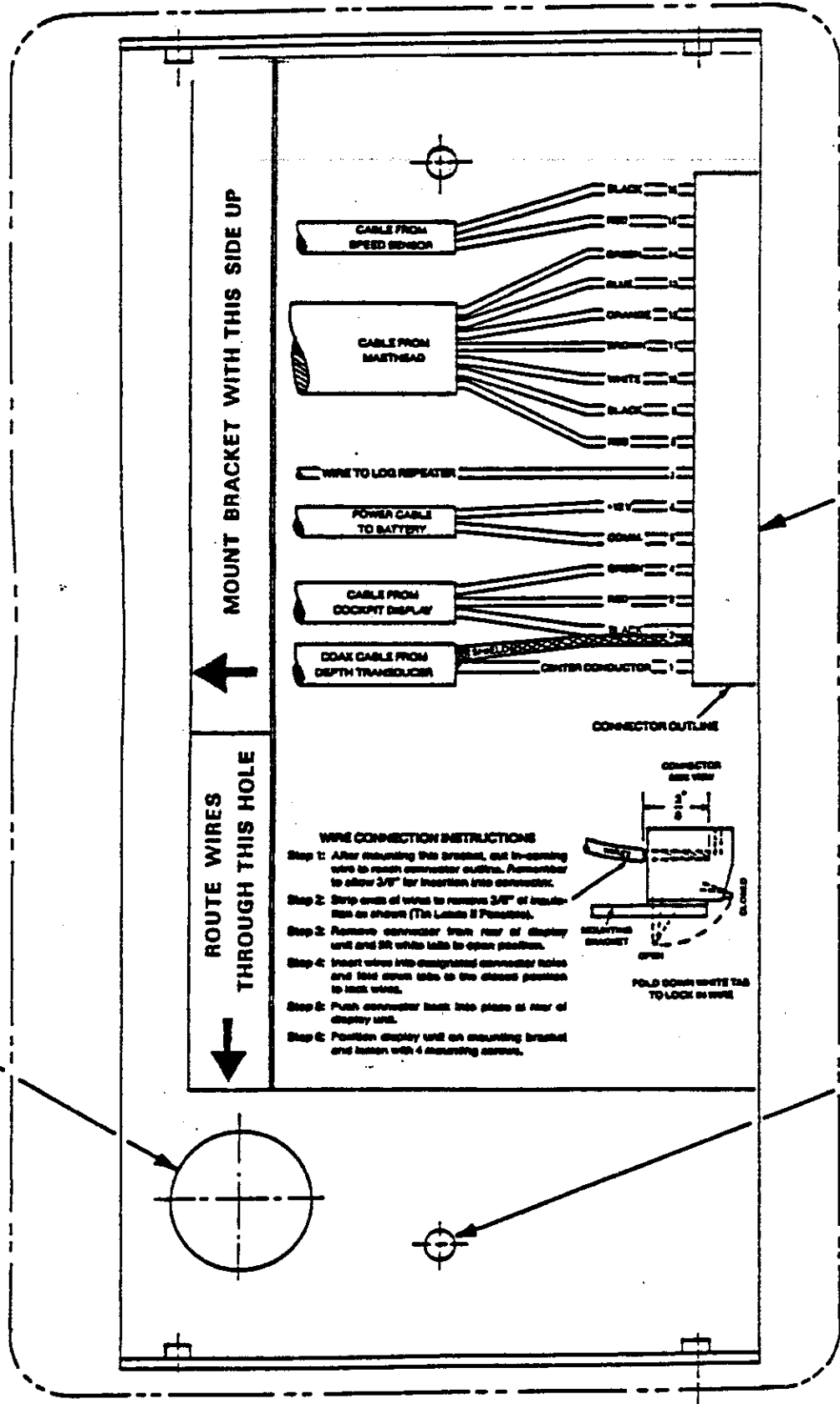
SHALLOW GAIN

GAIN



SCHEMATIC [DEPTH P.C. BOARD]

DRILL 1" HOLE IN MOUNTING SURFACE

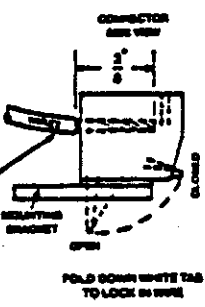


MOUNT BRACKET WITH THIS SIDE UP

ROUTE WIRES THROUGH THIS HOLE

WIRE CONNECTION INSTRUCTIONS

- Step 1: After mounting the bracket, cut incoming wire to match connector outline. Remember to allow 3/8" for insertion into connector.
- Step 2: Strip ends of wires to remove 3/8" of insulation as shown (The Labels of Parasites).
- Step 3: Remove connector from rear of display unit and set white tabs to open position.
- Step 4: Insert wires into designated connector holes and fold down tabs to the closed position to lock wires.
- Step 5: Push connector back into place at rear of display unit.
- Step 6: Position display unit on mounting bracket and fasten with 4 mounting screws.



MOUNTING BRACKET

OUTSIDE EDGE OF DISPLAY

BRACKET MOUNTING HOLES

USE FOUR 6-32 x 3/8 L SCREWS TO SECURE DISPLAY TO MOUNTING BRACKET