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this is NANCY

BUREAU OF SHIPS
NAVSHIPS 250-222-10

NAVY DEPARTMENT

BUREAU OF SHIPS

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Washington, 1 November 1945

1. NAVSHIPS 250–222–10 is the introductory publication on all NAN or NANCY equipment. It is classified CONFIDENTIAL and is not registered.

2. Effective upon receipt, it completely supersedes and replaces the secret and registered publication "General NAN Manual, Ships–13."

3. The superseded publication, "Ships–13," must be destroyed by burning in accordance with instructions given in Chapter X, Section 4, of RPS 4 (B), and report of destruction made on Form RPS 2.

E. L. COCHRANE
Vice Admiral, U. S. N.,
Chief, Bureau of Ships.

This is Nancy

NAVSHIPS 250-222-10
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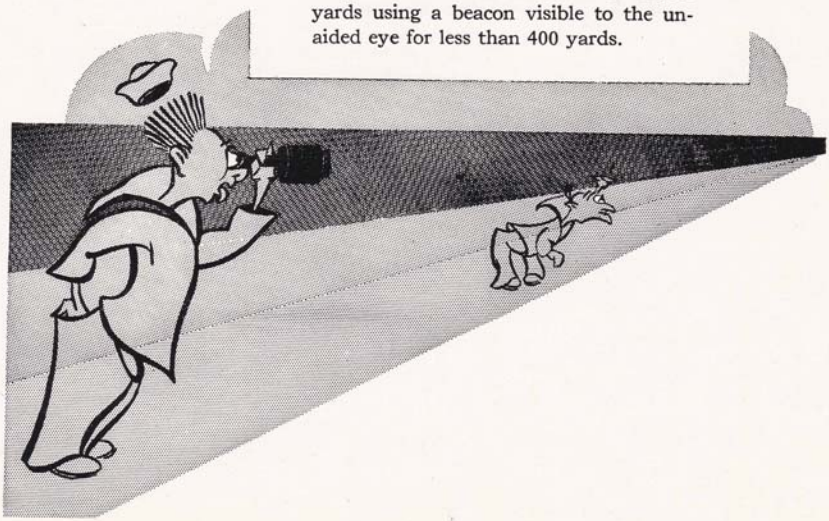
CONTENTS

RECORD OF CORRECTIONS

Change No.	Date Entered	Signature of Officer

NANCY HAS PENETRATING EYES . . . .

eyes that see at night what unaided eyes cannot see. Eyes that enable you to cut down your signal searchlight to a scarcely visible glow and still get the message across, accurately and securely. Eyes that allow you to contact "All Ships" at distances in excess of 12,000 yards using a beacon visible to the unaided eye for less than 400 yards.



WHAT NANCY IS . . . .

"NANCY" is the familiar name applied to equipment used for night signaling, recognition and reconnaissance, recently developed by the Navy under the technical code-name, "NAN".

It includes searchlights and beacons which produce what we shall call at first "invisible light" . . . . plus receivers to transform this "invisible light" into images you can see or sounds you can hear.

A type of equipment which *produces* or transmits "invisible light" is referred to as a NANCY *Source*. The type used to *detect* or receive "invisible light" is designated as a NANCY *receiver*.

HOW NANCY CAN SERVE YOU....

NANCY sees signals at night which neither you nor the enemy can. She's your "friend in need" after dark.

NANCY renders *visual* communications at night virtually *invisible*, and far more secure than ever before.

NANCY provides an entirely new, highly secure means of night signaling, reconnaissance, recognition, navigation, station keeping and beach marking . . . . a method which appears fantastic the first time you see it used, but one which is fundamentally simple in design and operation.

On nights of normal visibility, NANCY can receive "Invisible" flashing light signals up to horizon distances. She can see and recognize shore-line contours at ranges in excess of 1,000 yards, objects the size of a lifeboat approximately 500 yards away, and objects the size of a swimmer or floating mine more than 200 yards away.

NANCY provides an entirely new method of night challenge and reply for the fleet . . . . she can guide you to a beach, or through a harbor, or help you keep station in formation at night . . . . . *without violation of radio silence or black-out conditions!*

YOU'VE NEVER SEEN A WAVE LIKE NANCY . . . .

To understand what happens when NANCY goes on watch, let's consider WAVES.

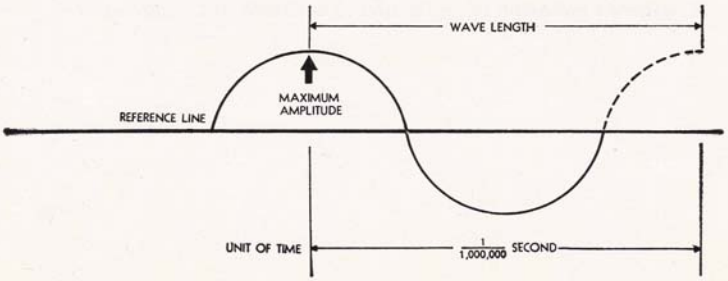
No . . . . not the kind of waves you have taken over the bow . . . . not the kind they sell at beauty shops for about the same price as a slightly used, second-hand Captain's gig. . . . . and not the kind that wear the Navy uniform.

The kind of waves we are concerned with are the waves that go out from your radio antenna . . . . the kind you feel as heat . . . . or see as light . . . . or know as X-rays, Gamma Rays or Cosmic Rays.

Unlike *sound* waves, which consist of alternate piling-up and thinning out of air molecules (or, as the scientists say, "alternate condensations and rarefactions") . . . . radio, heat, light, X, Gamma and Cosmic waves are believed to be electrical "fields" traveling through space. These waves need no special medium (like air) for transmission, and will travel through a vacuum. Such rays are called ELECTROMAGNETIC WAVES.

One complete series of changes in a wave of this type . . . . from the time it begins to build up to "peak" intensity or amplitude, and then falls back to a "contra-peak", and finally returns back up to zero . . . . one such complete series of changes is called a CYCLE.

By means of a simple chart, we can picture the CYCLE of an electromagnetic wave.



The FREQUENCY of a wave is the number of cycles occurring within a set period of time, such as one second. So, if the time required to complete the wave cycle we have pictured is one millionth of a second . . . then this wave would make 1,000,000 cycles over a full, one second period. The FREQUENCY of the particular wave we have chosen is therefore 1,000,000 cycles per second (or one megacycle).

The WAVE LENGTH of a wave is the distance between "crests" of two successive cycles . . . a factor that can easily be determined when we know the SPEED at which the wave travels.

Thus if we know that a wave with a frequency of 1,000,000,000 cycles per second, travels 1,000,000,000 feet per second . . . by 5th grade arithmetic we can divide one billion by one billion and determine that its WAVE LENGTH is 1 foot.

The simple WAVE LENGTH formula is:

$$\text{WAVE LENGTH} = \frac{\text{Speed}}{\text{Cycles}}.$$

Experiment long ago established that *light* waves travel at the rate of approximately 186,000 miles per second . . . or nearly 1,000,000,000 feet per second (as shown in our example). The SPEED appearing in our formula is therefore always constant . . . always 1,000,000,000 feet per second when we are referring to *light* waves.

Knowing this, we get a very obvious, easy-to-understand relationship between FREQUENCIES and WAVE LENGTHS. When FREQUENCIES increase, WAVE LENGTHS decrease. To say the same thing in another way: light waves of *high* frequencies are waves of *short* wave length, and light waves of *low* frequencies are waves of *long* wave length. To say the same thing in still another way: the FREQUENCY of a light wave varies *inversely* as its WAVE LENGTH.

The FREQUENCIES of *light* waves are extremely high as compared with those of *sound* and *radio* waves. Consequently, when we begin substituting actual examples in our formula, we get all bogged down in BIG figures, like this:

$$\textbf{WAVE LENGTH} = \frac{\textbf{1,000,000,000 feet per second}}{\textbf{25,000,000,000,000 cycles per second}} = \textbf{.00004 feet}$$

Obviously, these are figures that are too large and unwieldy to deal with . . . and you can't visualize them in your mind anyway. So . . . in referring to frequencies of light waves, scientists usually express them in terms of cycles to a certain "power." So don't let 10 to the 16th power scare you if you see it used in referring to the frequency of NANCY radiation. All it means is that the frequency is "1" with 16 zeros behind it . . . or 10,000,000,000,000,000 cycles per second . . . .written 10^{16}.

1 cycle equals one complete period of a wave.
1 kilocycle equals 1,000 cycles.
1 megacycle equals 1,000 kilocycles, or 1,000,000 cycles.
10^9 cycles equal 1,000 megacycles or 1,000,000,000 cycles.

Likewise, in referring to WAVE LENGTHS of light waves, we choose to express them in smaller units than "feet". A common unit of WAVE LENGTH is the "Micron" (expressed by the Greek character *mu*, which is written *u*). And still another common unit of WAVE LENGTH is the "Angstrom" (written Å). Here is how these units are developed:

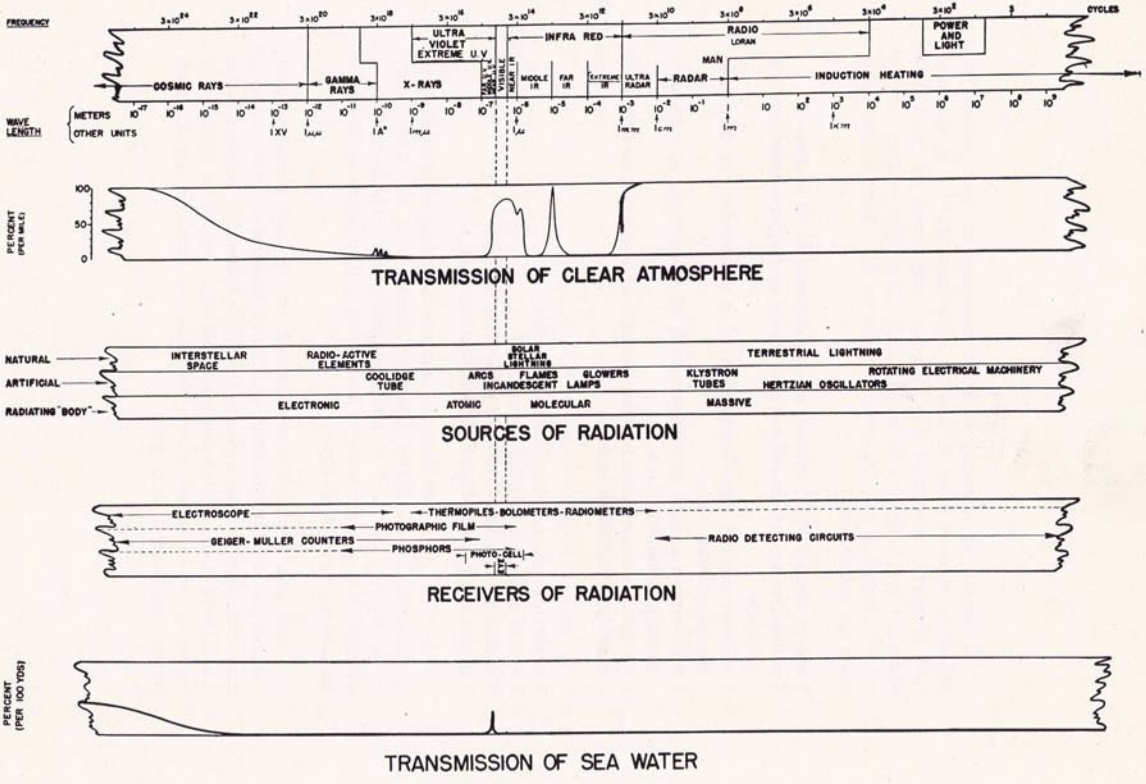
1 meter equals 39.37 inches, or approximately 40 inches.
1 millimeter equals one-thousandth of a meter, or approximately .04 inch.
1 micron equals one-thousandth of a millimeter, or approximately .00004 inch.
1 millimicron equals one-thousandth of a micron, or approximately .00000004 inch.
1 Angstrom equals one ten-thousandth of a micron, or approximately .000000004 inch.

To present the same table in a different way:
1 meter equals 1,000 millimeters (mm).
1 meter equals 1,000,000 microns (*u*).
1 meter equals 1,000,000,000 millimicrons (M*u*).
1 meter equals 10,000,000,000 Angstroms (A.)

We have presented these few statements leading up to a definition of FREQUENCY and WAVE LENGTH, because it is the FREQUENCY or the WAVE LENGTH of an electromagnetic wave which determines whether it is a radio wave, a heat wave, a light wave, an X-ray, a gamma ray, or a cosmic ray.

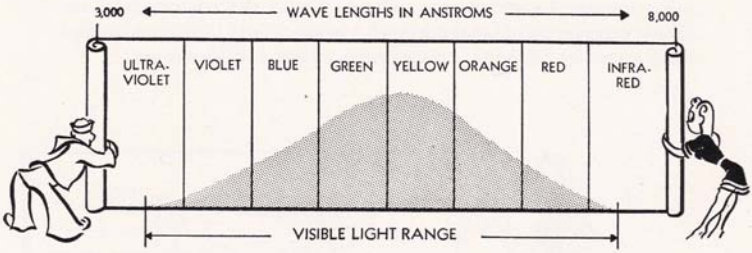
And now that you have learned (or at least refreshed your memory) of what FREQUENCY and WAVE LENGTH are, the following chart will show you at a glance that light waves fall between radar and X-rays in the electromagnetic spectrum. And from light waves, we can go on to explain where the waves of "invisible" light, which NANCY sources emit, come from.

ELECTRO- MAGNETIC SPECTRUM

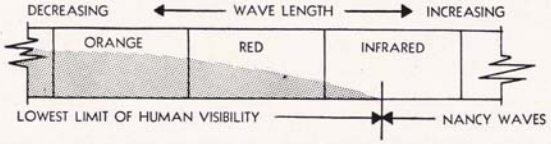


Now, let's put that part of the chart of electromagnetic waves marked "visible" under a microscope to get a more detailed picture:

CHART (OR SPECTRUM) OF LIGHT WAVES



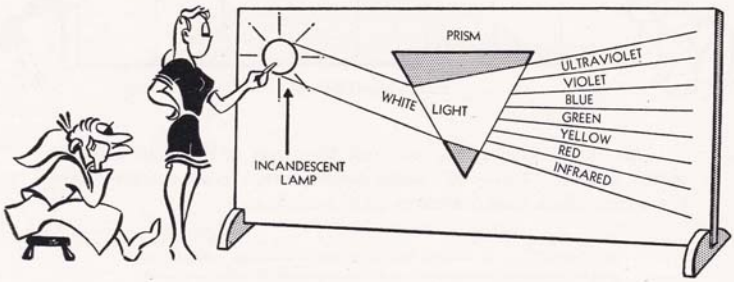
And now, once again, let's put that part of the chart of *light waves* marked "Infra-red" under magnification to see exactly where the waves which NANCY sources emit come from:



NANCY sources emit invisible rays which fall above the wave length range of light which the human eye is capable of seeing, and just below the wave length range of heat waves.

Since "light," by definition, is a form of radiant energy that acts on the eye and makes things visible . . . . obviously, there can't be such a thing as "invisible light." Consequently, as we get into a technical discussion of NANCY equipment, we can no longer continue to refer to NANCY'S INVISIBLE rays as "invisible light." NANCY rays actually are *not* light waves . . . . nor are they heat waves . . . . but fall just between the two.

White light, such as sunlight, firelight, or light from an ordinary incandescent electric light bulb is a combination of light waves of many frequencies and colors. This is vividly demonstrated by the simple experiment of breaking down a beam of light into its individual light waves by means of a glass prism. Here's what you get:



Nature sometimes does this for you on those rare occasions when droplets of moisture in the air transform the sun's rays into a rainbow.

Consequently, we can use an ordinary electric light to produce NANCY rays, and ONLY NANCY rays, if we use a "filter" to completely remove all the *visible* light rays that are produced. This is exactly what is done in NANCY sources. This is accomplished by covering any standard or specially constructed searchlight or beacon with a specially designed, visually opaque, glass or plastic NANCY filter, through which *only* NANCY rays can pass.

ELEMENTARY CHARACTERISTICS OF NANCY WAVES

1. NANCY waves, like visible light waves, travel in a straight line, at a rate of 186,000 miles per second.

2. At wave lengths of about 4000 to 8000 Angstroms, light waves are visible to the human eye as colors, or as white light, which is a combination of waves of *all* wave lengths. NANCY waves, however, are waves whose wave lengths are *longer* than 8000 Angstroms, and just beyond the range of visibility.

3. As we move up the scale of *light waves* toward those of very longest wave length, we approach, and begin to get over into the *heat wave range*.

These three points are the basis for an intelligent understanding of NANCY's capabilities.

The fact that NANCY waves travel in a straight line clearly explains why NANCY'S range is limited to the horizon . . . . and why NANCY sources should be mounted as high as possible on your ship.

The fact that NANCY rays have wave lengths just above those of visible, red light waves demonstrates why (when you get within 400 yards of a NANCY source) you may see a faint red glow with the unaided eye.

The fact that NANCY rays have wave lengths just below those of heat waves explain why (when you get close to a NANCY source) you feel *heat* on your cheek where you would expect to see *light*.

HERE'S HOW NANCY OPERATES . . . .

The way NANCY transmits and receives rays you can't see may be compared to the way a radio transmits sounds you can't hear until they are reproduced by a receiver.

In the one instance, the radio transmitter sends out a radio frequency wave to a receiver which converts it into a sound wave at a frequency within your hearing range.

In a similar manner, some types of NANCY equipment send out waves that are beyond the visible light range to a receiver which converts them into light waves *within* the visible range. Like a CW or A–1 radio emission, which sends out a keyed radio wave at one set frequency and amplitude . . . . some NANCY sources emit key or shutter interrupted invisible waves of constant intensity.

Other NANCY equipment, however, like modified CW, or A–2 radio emissions, call for impressing a *sound* wave pattern on the basic "carrier" wave, varying its amplitude by a process known as "modulation."

And still another type of NANCY equipment of advanced design, like A–3 radio emissions, "modulates" a carrier beam in such a way as to permit voice reproduction at the receiving end.

Thus, NANCY'S characteristics are easy to understand. As a signalman, or a technician . . . . you've seen her type before. She operates similarly to equipment with which you have long been familiar.

NANCY'S FAMILY ALBUM

NANCY SOURCES

All NANCY sources consist of some type of electric light, a special NANCY filter and a power supply. Naturally, there are many supplementary components and refinements in some of the more highly developed models . . . but, fundamentally, all you need to produce NANCY radiation is light, power and a filter, and these are the only components common to ALL sources.

NANCY sources may be grouped according to their function or use, as follows:

1. **Signal Searchlights, including the standard Navy 8" and 12" equipment with the addition of a filter-lens and hood.**
2. **Beacons, to serve purposes similar to those of shipboard broadcast lights with which you are already well acquainted.**
3. **Beachmarkers, provided chiefly in portable models with portable power supplies.**
4. **Specialized Equipment, including the Type Dog System of modulated code transmission, and the Type Easy System of voice modulated transmission.**

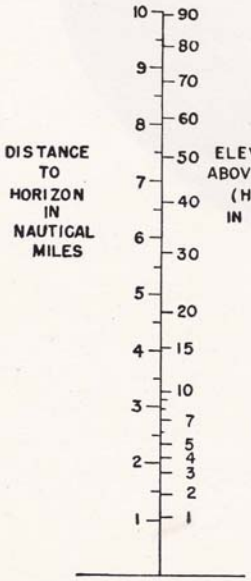
For other purposes it may be desirable to group NANCY sources according to their tactical purposes, as follows:

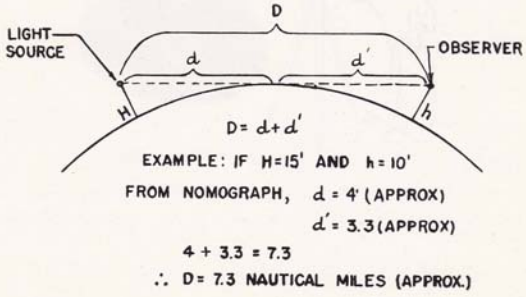
1. **Amphibious.** **Type H-1, 8" searchlight wtih filter-lens and hood.**
   Type X-9A and X-9B beacons.
   Type X portable beach-marker.
   Type X-7 dual-mounted course-marker.
   Type X-8 dual-mounted beach-marker.
2. **Shipborne.** **Type H, 12" searchlight with filter-lens and hood.**
   Type X-2A 180-degree beacon.
   Type X-3A 180-degree beacon.
   Type X-12 beacon, or point-of-train light.
   Type D System of Code transmission
   Type E System of voice transmission.

Photographs and pertinent facts about available production models of NANCY gear are presented on the pages which follow. But PLEASE NOTE, with regard to operational data on individual models . . . this equipment is adversely affected by fog, haze and rain in much the same way as your regular, visual, daytime signaling equipment is affected. It is a well established scientific fact that yellow fog lights do not penetrate the atmosphere any better than white lights . . . and that they are actually inferior to white lights, since some light is absorbed by the yellow filter. The same explanation applies to NANCY sources. The range of a NANCY source is reduced by adverse weather conditions to approximately the same degree as the range of a white light of comparable intensity. In conditions of very bad visibility, NANCY equipment may be rendered virtually inoperative.

The ranges given for various types of NANCY equipment on the pages which follow are no more than rough approximations, and are for *flashing* signals under *average* weather conditions. "Pick-up" should be effected at ranges considerably beyond those given . . . provided your source and receiver are mounted sufficiently high above the water to raise the beam of radiation over the curvature of the earth to the range desired.

Here is a scale and easy-to-use formula for determining minimum mounting heights for the equipment at various ranges up to 10 miles.





TYPE H–1 HOOD FOR 8-INCH SIGNALING SEARCHLIGHT

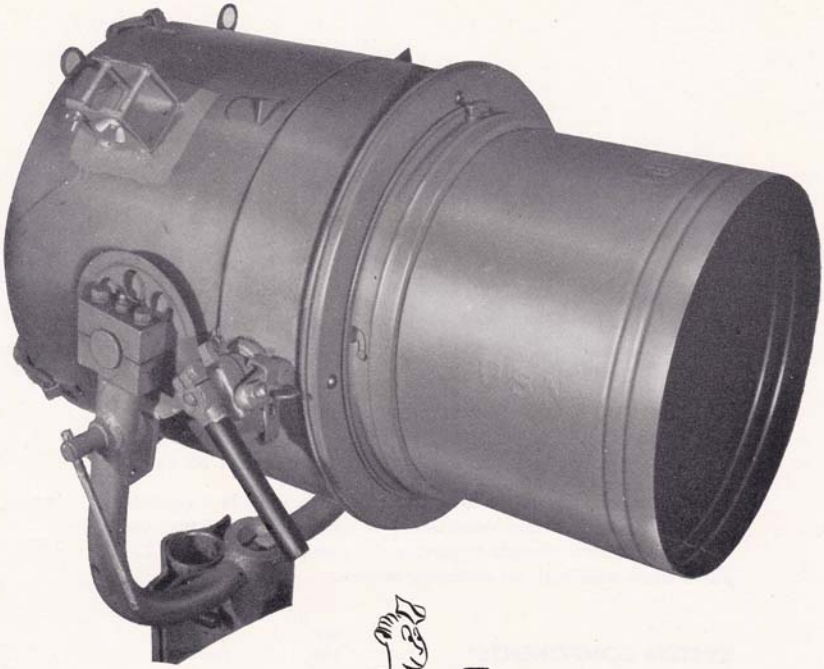
Type H–1 NANCY gear consists of a NANCY filter-lens and hood for mounting to the #97103 Navy 8″ searchlight. It is particularly designed for use by Beach Parties, and on LCC's, AGC's and APA's . . . for signaling and recognition.

The H–1 is flashed electrically through a manual key. Operating voltage required is 13, and is supplied either by storage batteries or a portable gasoline generator. Total power required is 86 watts.

Communicating range to be expected with Type H–1 equipment (under average weather conditions) is approximately 7,000 yards, when used with a phosphor receiver . . . and approximately 12,000 yards when used with an electronic receiver.

SYSTEM COMPONENTS*	Wt. Lbs.	Overall Dimensions (in inches)
(1) Navy 8" Searchlight	**20**	**12 x 11 x 21**
(2) Receiver Clamp	**Negligible**	**1 x 2 x 2½**
(3) Type H–1 Hood	**4**	**10½ x 12 x 8½**
(4) Type H–1 Filter-Lens	**1**	**8 dia.**
(5) Image-forming receiver of any type		

***The number of systems allowed per vessel range from 1 to 10 depending on the class of vessel.**



TYPE H HOOD FOR 12-INCH SIGNALING SEARCHLIGHT

Type H NANCY gear consists of a NANCY filter-lens and hood for mounting to the standard Navy 12" searchlight. It is used on both major and minor war vessels for signaling and reconnaissance.

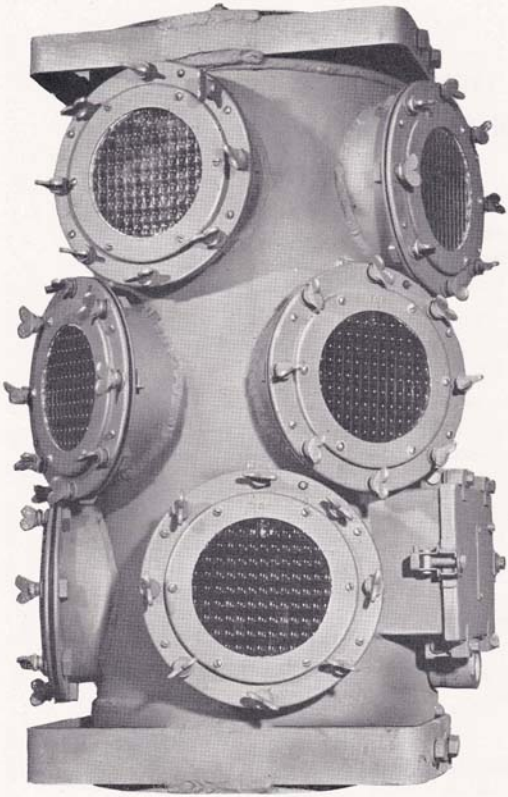
The Type H is shutter operated, and uses ship's power at 115 volts AC or DC. Total power required is 1,000 watts. Minimum mounting height is 30 feet.

Signaling range to be expected (under average weather conditions) is approximately 11,000 yards, when used with a phosphor receiver . . . . and approximately 16,000 yards when used with an electronic receiver.

For additional information on installation and operation of Type H gear, request the "Type H Photo Manual" from the Bureau of Ships.

SYSTEM COMPONENTS*	*Wt. Lbs.*	*Overall Dimensions (in inches)*
(1) Navy 12" Searchlight	**140**	**27 x 22 x 20**
(2) 1 Spare Parts Box	**5**	**14 x 14 x 2**
(3) Receiver Clamp	**Negligible**	**3 x 2 x 1**
(4) Type H Hood	**10**	**11 x 15 (dia.)**
(5) Image-forming Receiver of any type		

***The number of systems per vessel ranges from 1 to 10 depending on the class of vessel.**



TYPE X-2A BEACON SYSTEM

Type X-2A NANCY gear is a 6-lamp beacon which covers a 180 degree sector. One unit is required for port and a second unit for starboard installation for 360-degree coverage. It is used for recognition and communications on major war vessels. (BB, CA, CB, CL, CVB, CVL, CVE, CV, AD, AGC, AGC(R), AP, APA.)

The equipment uses ship's power (115 volts AC or DC) and requires a total of 1,800 watts per beacon. Each of the six lamps of the beacon is a PAR-46, NANCY #NL-1048, 300-watt sealed beam unit, rated for 200 hours of steady burning. Mounting height of the beacon should be at least 40 feet above water.

Communicating range to be expected (under average weather conditions) is approximately 6,000 yards, when used with a phosphor receiver . . . . and approximately 9,000 yards when used with an electronic receiver.

For further details of X-2A equipment, request the X-2A Manual (NAVSHIPS 250-222-15) from the Bureau of Ships.

SYSTEM COMPONENTS	*Wt. Lbs.*	*Overall Dimensions (in inches)*
(1) Two X-2A Beacons	**220**	**30 x 15 dia.**
(2) Control Panel	**51**	**20 x 16 x 7**
(3) Relay	**42**	**19 x 18 x 6**
(4) Manual Key	**10**	**5 x 6 dia.**
(5) Selector Switch	**5**	**8 x 5 x 4**
(6) Automatic Keyer*	**143**	**22 x 36 x 12**
(7) Image-forming receiver of any type		

*Optional equipment.

TYPE X–3A BEACON SYSTEM

The X–3A NANCY source is a single-light, 180 degree beacon used for recognition and communications on auxiliary and combatant ships, landing ships, patrol, and district craft. Two units per vessel are required for 360 degree, "All Ships" coverage.

The equipment uses ship's power (115 volts AC or DC). The beacon uses a Type T–20 NANCY #NL–1013 medium bipost, 300-watt lamp, rated for 200 hours of steady use.

Communicating range to be expected (under average weather conditions) is approximately 2,000 yards, when used with a phosphor receiver . . . and approximately 4,000 yards when used with an electronic receiver.

For additional details on installation and operation of the equipment refer to publications issued with the gear.

SYSTEM COMPONENTS	*Wt. Lbs.*	*Overall Dimensions (in inches)*
(1) Two X–3A Beacons	**30**	**12 x 10 dia.**
(2) Control Panel	**14**	**11 x 12 x 6**
(3) Manual Key	**2**	**$5\frac{1}{2}$ x $5\frac{1}{2}$ x $5\frac{1}{2}$**
(4) Selector Switch	**2**	**5 x 6 x 4**
(5) Cutout Switch	**1**	**2 x 2 x 2**
(6) Automatic Keyer* (AC or DC)		**11 x 12 x 9**
(7) Spare Parts Box		
(8) Image-forming receiver of any type		

*Optional equipment.

TYPE X–9A and X–9B BEACON SYSTEMS

X–9A and X–9B NANCY sources are 360 degree beacons for recognition and communications on small landing craft. The X–9B is simply a larger, improved model of the X–9A. Both may be automatically or manually keyed, or used as a steady "position light."

Total power required by the source is 96 watts, delivered by ship's power at a potential of either 12 or 24 volts DC, as outlined below. A 96 watt, Type G–16½ lamp, NANCY #NL–1005 is used in the case of the 12 volt power supply. A 96 watt, #NL–1000 lamp is used with the 24 volt power supply.

Communicating range of this equipment, when used with a phosphor receiver and under average weather conditions, is approximately 900 yards. When used with an electronic receiver, this range is extended to approximately 2,000 yards (under average weather conditions).

24-V SYSTEM COMPONENTS	Wt. Lbs.	Overall Dimensions (in inches)
(1) X–9A or X–9B beacon	3	7 x 6 dia.
(2) Control Keyer	20	13 x 11 x 7
(3) Manual Key	7	8 x 5 x 5
(4) Selector Switch	1	3 x 3 x 4
(5) Spare Parts Box	10	13 x 6 x 6
(6) NANCY image-forming receiver of any type		

12–V SYSTEM COMPONENTS		
(1) X–9A or X–9B beacon	3	7 x 6 dia.
(2) Manual Key	5	5 x 6 x 6
(3) Keyer Mounting Bracket	1	14 x 2 x 2
(4) Receptacle	2	3 x 3 x 3
(5) Selector Switch	2	3 x 3 x 4
(6) Spare Parts Box	10	13 x 6 x 6
(7) NANCY image-forming receiver of any type		

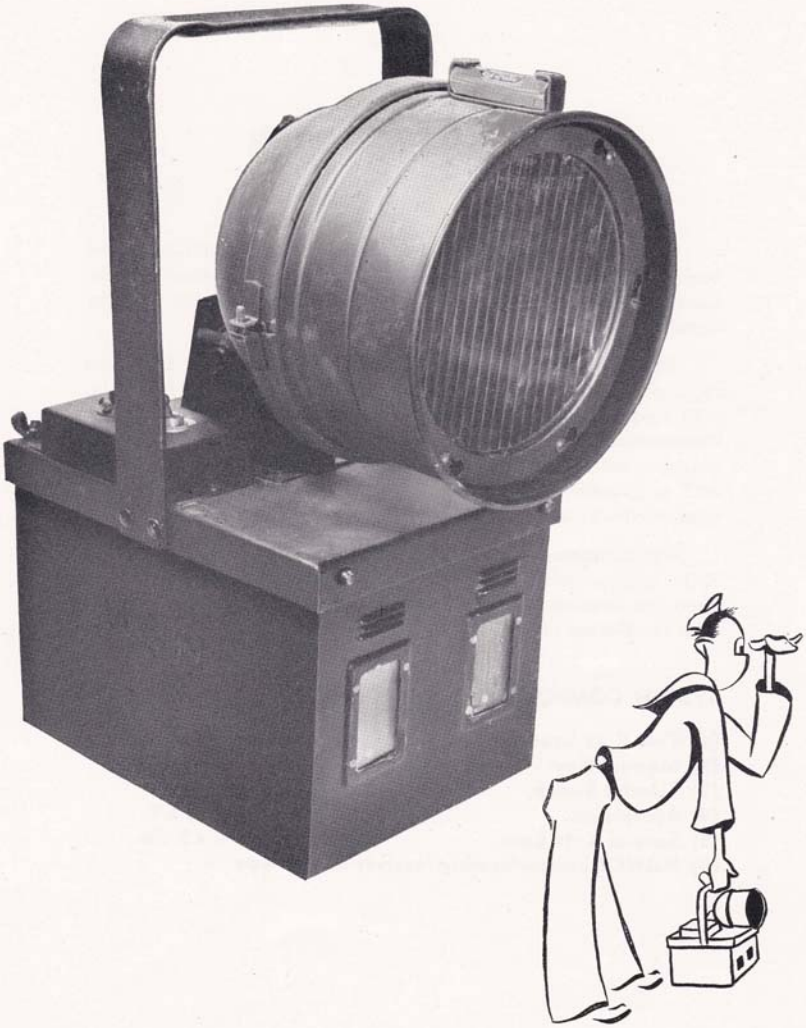
TYPE X-12 BEACON SYSTEM

The X-12 NANCY source is a 360 degree, manually keyed beacon used by combatant vessels, landing craft, patrol vessels, auxiliaries and district craft as a point-of-train indicator, and for signaling.

The equipment uses ship's power (115 volts AC or DC), and requires 500 watts. The lamp itself is NANCY Number NL-1014, with medium bi-post base, rated for 200 hours of steady burning. Communicating range to be expected from X-12 equipment, under average weather conditions, is approximately 1,500 yards when used with a phosphor receiver . . . and approximately 4,000 yards when used with an electronic receiver.

For additional details on installation and operation of Type X-12 equipment, refer to publications issued with the gear, or request the Manual of Instructions for Type X-12 NANCY beacon from the Bureau of Ships.

SYSTEM COMPONENTS	*Wt. Lbs.*	*Overall Dimensions (in inches)*
(1) Two X-12 beacons	**40**	**12 x 7 dia.**
(2) Manual Key	**5**	**5 x 5 x 4**
(3) Selector Switch	**2**	**5 x 5 x 4**
(4) Receptacle	**2**	**4 x 4 x 2**
(5) Special X-12 Cam	**.1**	**½ x 3 dia.**
(6) NANCY image-forming receiver of any type		



TYPE X BEACHMARKER

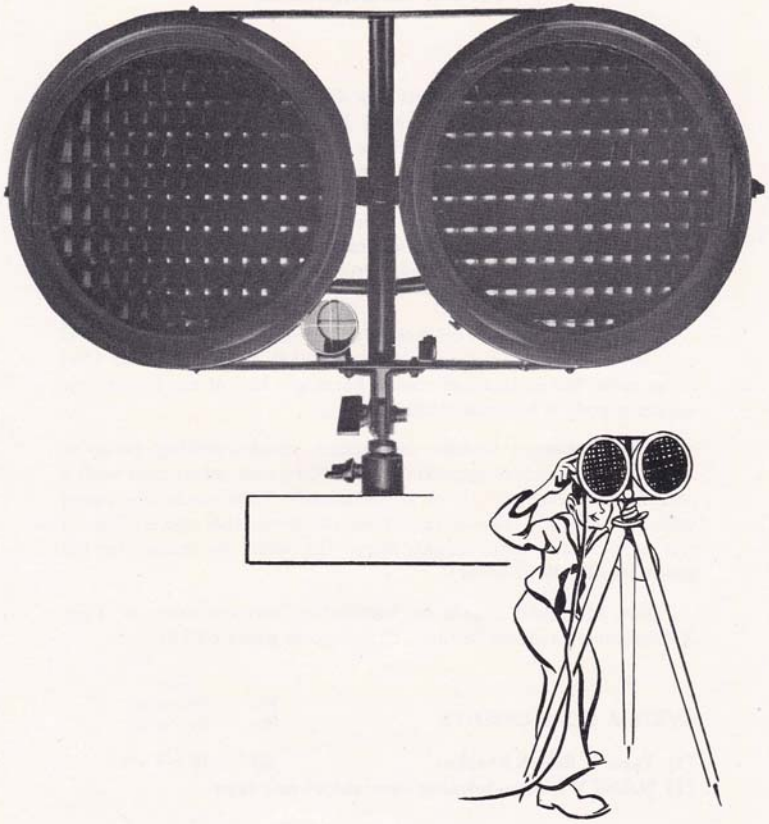
Type X NANCY equipment is a directionally beamed, portable source adapted from the standard Navy (Stock No. 17–L–7765) damage-control lantern. It emits a steady ray for beachmarking, or may be manually keyed for recognition and communications. In emergencies, the gear may be used aboard landing craft, but it has extremely narrow vertical coverage which requires absolutely level mounting for successful operation. By turning the lens 90 degrees, however, it might have limited use in hand-held signaling aboard ship.

The gear is powered by three Navy 17–L–9507 lead acid (2-volt) cells in series, and employs a 40-watt, PAR–46 NANCY #NL–1040 lamp, rated for 50 hours of steady burning. Life of the batteries is approximately 4 hours of steady use.

Under average weather conditions, communicating range of Type X equipment is approximately 4,000 yards, when used with a phosphor receiver . . . . or approximately 7,000 yards when used with an electronic receiver (provided, of course, that the equipment can be mounted high enough above the water to utilize the full sensitivity of the receiver).

For additional details on installation and operation of Type X Equipment, request "Ships–11" from your nearest RPIO.

SYSTEM COMPONENTS	*Wt. Lbs.*	*Overall Dimensions (in inches)*
(1) Type X Beach Marker	**20**	**15 x 9 x 7**
(2) NANCY image-forming receiver of any type		



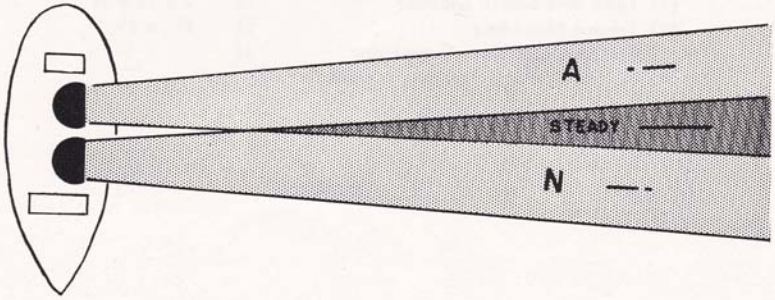
TYPE X–8 BEACHMARKER

Type X–8 NANCY equipment is a dual-head, tripod mounted, directionally beamed portable light used on the beach both as a marker and for communications. It can be set up as a steady position signal or manually keyed.

The marker uses two 86-watt sealed beam lamps (Mazda #4563) each rated for 50 hours of steady burning. The equipment is powered by a portable gas generator that weighs only 145 pounds, and holds sufficient fuel in its main and reserve tanks for approximately 10 hours of continuous operation.

Under average weather conditions, communicating range to be expected from Type X–8 equipment is approximately 6,000 yards, when used with a phosphor receiver . . . . and approximately 9,000 yards when used with an electronic receiver.

SYSTEM COMPONENTS	*Wt. Lbs.*	*Overall Dimensions (in inches)*
(1) Type X–8 Beach Marker	**15**	**7 x 12 x 21**
(2) Tripod Mounting	**15**	**$5\frac{3}{4}$ x $5\frac{3}{4}$**
(3) Portable Gasoline Generator	**45**	
(4) NANCY image-forming receiver of any type		



TYPE X-7 COURSE MARKER

Type X–7 NANCY gear consists of a dual-head, tripod mounted, directionally beamed course marker originally designed for installation on landing craft directly below the YL radio antenna, its purpose being to guide smaller landing craft and auxiliaries to a beach. It beams out a steady "on course" signal down a narrow central sector, plus "A" and "N", left-of-course and right-of-course signals.

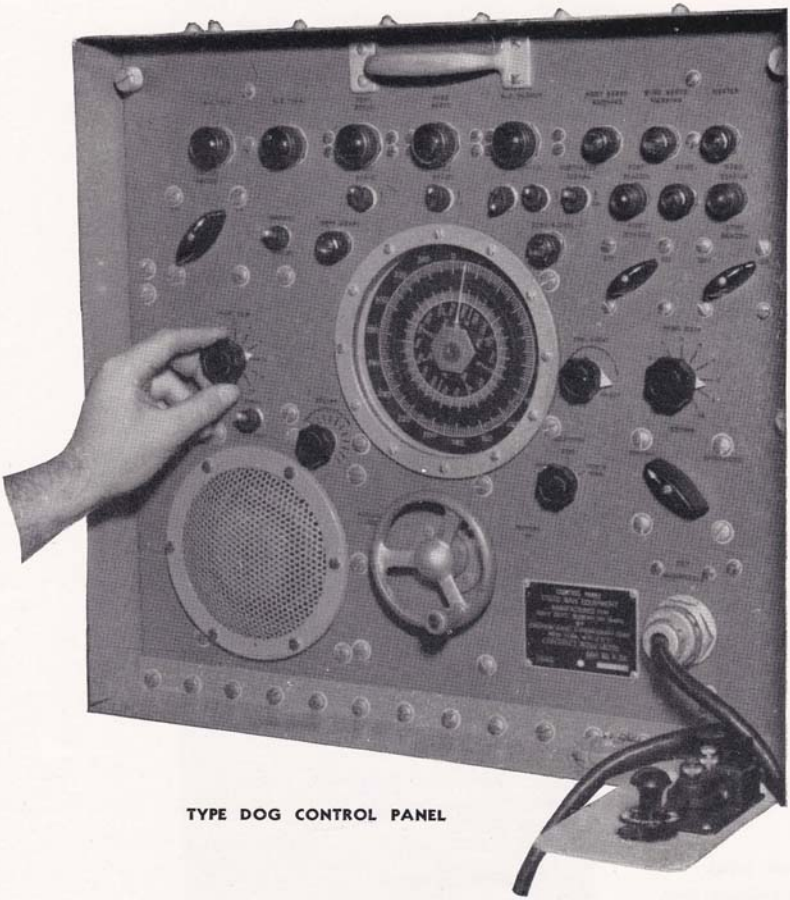
The course marker uses ship's power (115 volts AC or DC). The Source element consists of two 300 watt sealed beam lamps (Mazda #4568), each rated for 100 hours of continuous use.

Under average weather conditions, the useful range of X–7 equipment is approximately 12,000 yards when used with a phosphor receiver, and approximately 16,000 yards when used with an electronic receiver.

For additional details on installation and operation of X–7 equipment, request "Ships–16" from your nearest RPIO.

SYSTEM COMPONENTS	*Wt. Lbs.*	*Overall Dimensions (in inches)*
(1) Type X–7 Course Marker	**15**	**7 x 12 x 21**
(2) Tripod Mounting	**15**	**5¾ x 5¾ x 58**
(3) Receptacle Box	**3**	**3¾ x 4½ x 4½**
(4) Pulsator	**29**	**6½ x 8½ x 12**
(5) NANCY image-forming receiver of any type		

TYPE DOG BEACON



TYPE DOG CONTROL PANEL

TYPE DOG
SCANNING AND
RECEIVING HEAD

THE TYPE D SYSTEM

The Type Dog System consists of from two to eight beacons (depending on the model used) and two gyro-stabilized, servo-controlled receiving heads. The equipment is designed for recognition and communication between major war vessels (DEs and above). Minimum mounting height is 40 feet above water. Ship's power (115-volt AC and DC) is used by the system.

The earlier model Type D source is a 360-degree beacon which uses a 500-watt, medium bi-post tungsten lamp. (NANCY #L–1010). Two beacons per vessel are required for 360-degree coverage without interference from the ship's superstructure.

The new, improved, D2 beacon consists of a bank of fifteen, 10-watt, 230-volt incandescent lamps, each of which has a fine, tungsten filament that permits considerably faster keying than is possible with the D source. Eight beacons of this type are required per vessel for 360-degree coverage.

Both the D and the D2 sources emit a modulated wave which can be reproduced at the receiving end either as flashing light or audible oscillation.

Advantages of the Type D System include: (1) greater speed of call-up and communication, and (2) below deck operation.

Under average weather conditions, communicating range of the Type D system is approximately 10,000 yards.

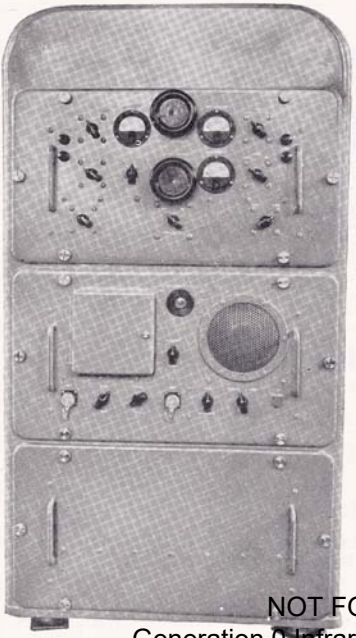
For details on installation and operation of the Type D System, refer to publications issued with the gear.

SYSTEM COMPONENTS	Wt. Lbs.	Overall Dimensions (in inches)
(1) Two type D beacons, or	140	26 x 13 dia.
Eight Type D2 beacons*	300	21 x 8 x 7¾
(2) Synchronizing Box for D Beacon, or	7	9 x 7 x 3
Power Supply for D2 beacon*	300	35 x 23 x 16
(3) Two Servo-Amplifiers	342	36 x 17 x 15
(4) Control Panel	234	28 x 23 x 16
(5) Motor Generator Set	124	20 x 12 x 8
(6) Automatic Keyer**	60	18 x 18 x 11
(7) Two Type D Receiving Heads	368	39 x 18 dia.

*One system uses two D beacons and synchronizing box, or 8 D2 beacons and power supply . . . plus the remaining components.
**Optional equipment.

TYPE E TRANSCEIVER WITH C-3 RECEIVER MOUNTED AS TRAINING SIGHT

TYPE EASY CONTROL PANEL



THE TYPE E SYSTEM

The Type Easy NANCY System consists of a 180 degree transceiver for communications between major war vessels (DEs and above). Two units are required per vessel for 360 degree coverage. Minimum mounting height is 40 feet above the waterline.

Ship's power (115 volts) is used by the system, and a total power of 400 watts is required from the AC supply, and 1,500 watts from the DC supply. The source element is a type CL–2, Caesium vapor lamp.

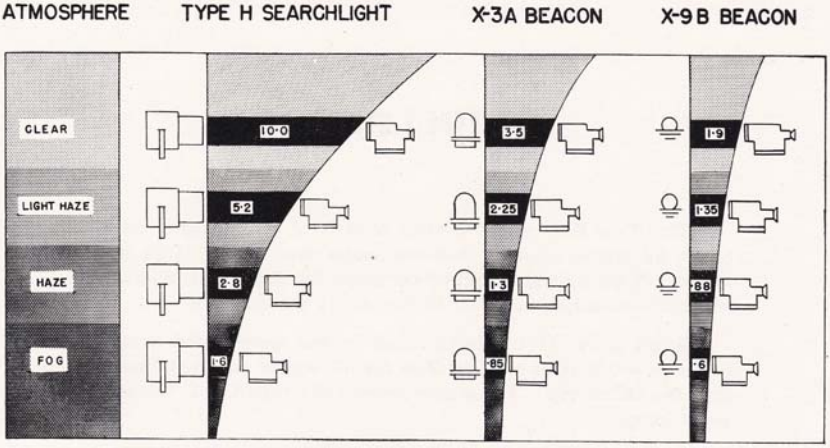
The Type E system emits a voice-modulated wave, and serves purposes similar to the TBS and other inter-ship voice circuits. It may, however, also be code-modulated. The unit requires training from the signal bridge by a signalman who sights with an electronic image-forming NANCY receiver, mounted to the equipment.

Communicating range to be expected with the Type E System, under average weather conditions, is approximately 8,000 yards.

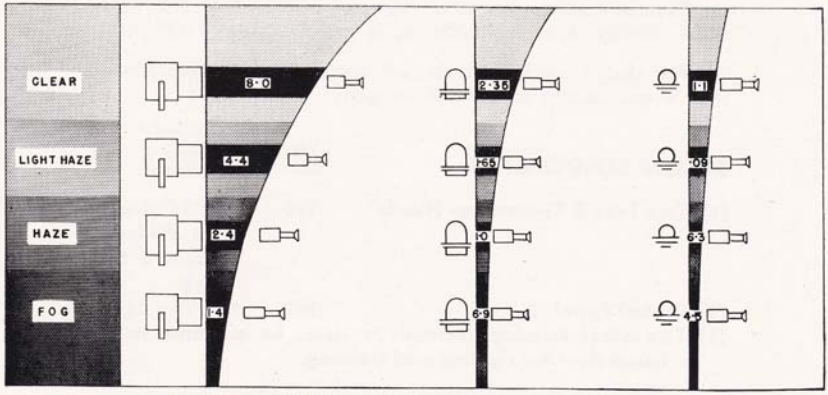
For details on installation and operation of the equipment, refer to publications issued with the gear.

SYSTEM COMPONENTS	*Wt. Lbs.*	*Overall Dimensions (in inches)*
(1) Two Type E Transceiver Heads	**175**	**Two 14" drums on Pedestal about 5 feet high.**
(2) Control Panel	**400**	**48 x 25 x 25**

(3) Two image-forming electronic receivers for mounting to the transceiver for sighting and training.



RANGES ATTAINABLE WITH C-3 RECEIVER
(NAUTICAL MILES)



RANGES ATTAINABLE WITH A M RECEIVER
(NAUTICAL MILES)

IMAGE-FORMING NANCY RECEIVERS

All NANCY receivers perform the same basic task. They gather up invisible NANCY rays and convert them into light you can see, or sounds you can hear.

This objective is accomplished, however, in different ways, in different types of receivers, designed for different purposes.

The image-forming receivers are small, portable, "telescope-like" viewers weighing from one to 30 pounds; while other non-image-forming receivers (such as the Type D and Type E) consist of larger, more complex equipment, permanently installed, and manned from the signal bridge or below deck.

Photographs and pertinent facts with regard to production types of NANCY image-forming receivers are presented on the pages which follow.

TYPE A-1 PHOSPHOR RECEIVER

This hand-held instrument, used by landing craft for receiving NANCY signals, is less than 8″ long and weighs less than two pounds.

The sensitive element of the A–1 is a phosphor disc or "button" which, when properly charged, transforms NANCY waves into visible light. The instrument requires three minutes to charge, and four hours to "age" the charge before it can be used.

Charging is accomplished by a tiny green light, powered by two dry cells, contained within the instrument housing.

For additional details about the A–1 receiver, request "Scope Dope", NAVSHIPS 250–222–12, from the Bureau of Ships.

TYPE AM PHOSPHOR RECEIVER

The AM, like the A–1 Receiver, is a small, hand-held phosphor-type receiver less than 7″ long, and weighing little more than a pound. It is used on all types or vessels from LCVPs on up, for receiving signals from NANCY sources.

Charging of the phosphor disc in the AM is accomplished by a small quantity of radium contained within the instrument. The receiver is consequently self-charging, when not in use; and may be put into service after only 15 minutes of "aging".

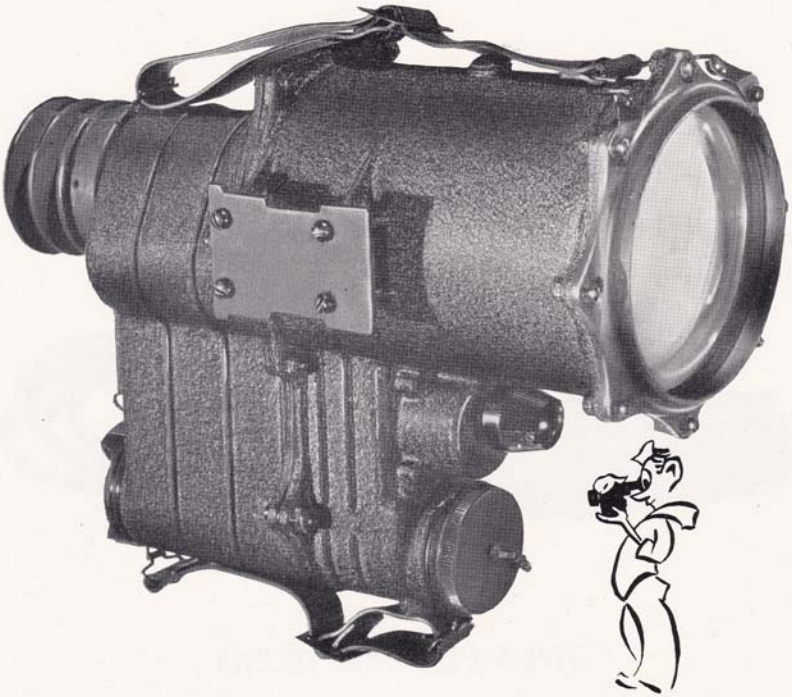
For additional details about the AM receiver, request "The Magic Pipe", NAVSHIPS 250–222–11, from the Bureau of Ships.

TYPE C-1 ELECTRONIC RECEIVER

The C–1 receiver is less than a foot long, and weighs less than 7 pounds. It is usually hand-held but is provided with a temporary mounting plate. It is used for recognition and signal receiving on major war vessels.

The sensitive element of the C–1 receiver is a photo-emissive tube, powered by three 1½-volt dry cells.

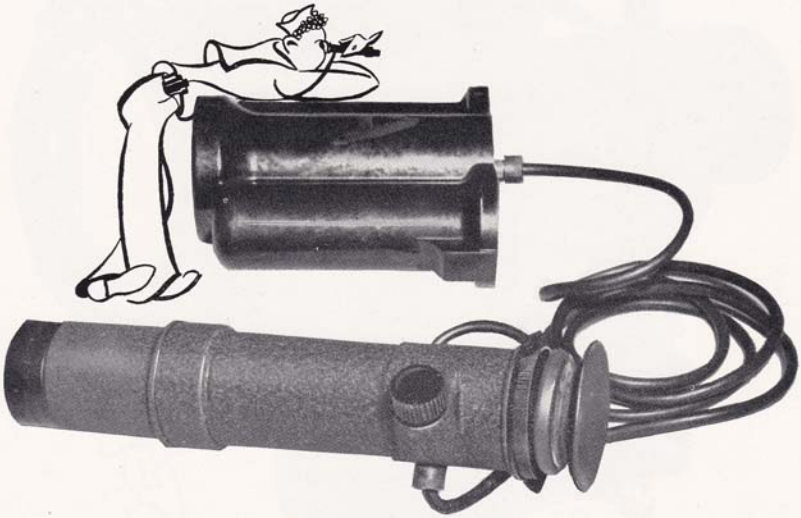
For details concerning care, operation and stowage of the C–1 NANCY receiver, request the Type C Photo Manual (NAVSHIPS 250–222–13) from the Bureau of Ships.



TYPE C-3 ELECTRONIC RECEIVER

The C–3 NANCY receiver is a hand-held, electronic receiver, similar to the C–1, for receiving NANCY signals aboard major war vessels. It is less than a foot long, weighs less than 8 pounds, and comes equipped with a plate for searchlight mounting.

The sensitive element of the C–3 is the same photo-emissive tube as used in the C–1, powered with two 1½-volt dry cells. Like the C–1, it is ready for use at all times. For additional details about the C–3, request the Type C Photo Manual, (NAVSHIPS 250–222–13) from the Bureau of Ships.



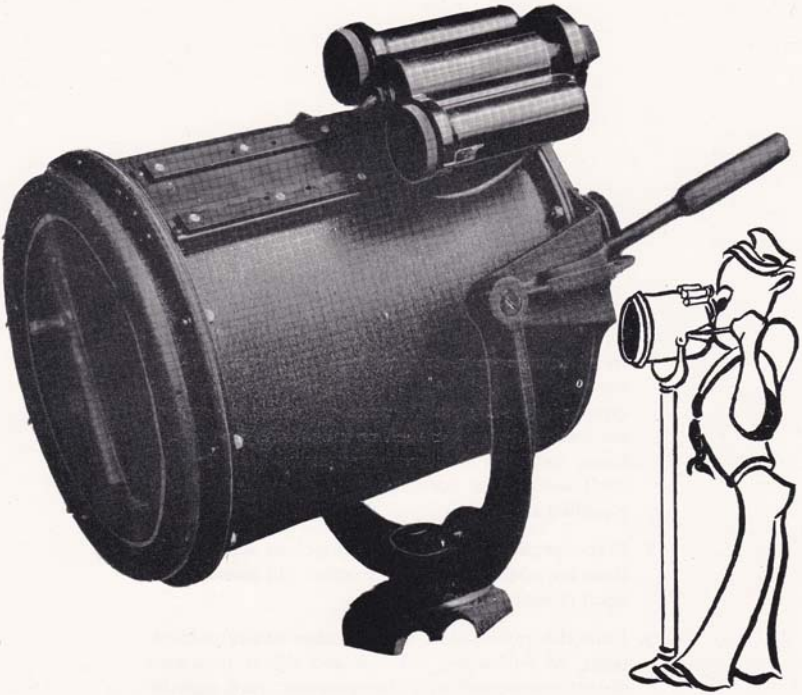
TYPE C–4 ELECTRONIC RECEIVER

The C–4 NANCY two piece receiver is designed for landing craft and major war vessels. The telescope is considerably smaller and lighter than the other "C" models.

The telescope is about 2″ in diameter, a little over a foot long, and weighs a pound and a half. It is therefore easily held in the hand, but it is provided with a temporary mounting bracket.

The sensitive element of the C–4 receiver is a photo-emissive tube powered by 4 dry cells which are carried by the operator in a "power-pack" weighing about 4 pounds. The receiver is ready for use at all times.

For details concerning care and operation of the C–4 NANCY receiver, refer to publications issued with the gear.



TYPE CF–2 ELECTRONIC RECEIVER

The CF–2 receiver is the largest, most sensitive of all NANCY image-forming receiving equipment.

As a general rule, it is mounted to a remotely controlled NANCY source, to form a reconnaissance *system*.

As in the case of the other "C" receivers, the sensitive element of the CF–2 receiver is an image-forming, photo-emissive tube powered by 4 dry cells.

The receiver is 12″ in diameter by 20″ long, and weighs approximately 20 pounds. When not used as a component of a reconnaissance system, it is equipped with a portable, tripod mounting. The receiver is ready for use at all times.

For details concerning care and operation of the CF–2 receiver, refer to publications issued with the gear.

IMPORTANT

1. In all references to this method of communication, use the word "NANCY", indicating particular types of gear by model number. Such references are unclassified. Detailed specifications and operational data are classified CONFIDENTIAL. The gear itself is classified CONFIDENTIAL. Research data is classified SECRET.

2. Make certain that all NANCY equipment and publications are added to your destruction bill immediately upon receipt.

3. Issue this publication, and all other NANCY publications, to authorized enlisted and officer personnel directly concerned with the operation, care, maintenance, or stowage of NANCY equipment, but avoid discussion of the gear with all other personnel.

MENT PRINTING OFFICE: 1945

ADDITIONAL DATA ON NANCY

"This is Nancy" is only an introduction to NANCY gear, and makes no effort to go into detail. Other publications, films and training aids cover operation and maintenance with regard to individual models. These are available from different sources, depending upon their classification. Available SECRET publications and films are regularly announced in Registered Publications Memoranda, and may be drawn from your nearest RPIO or MIO, as listed in the RPMs. For Pacific Fleet Doctrine and procedure of NANCY communications, consult PAC 70 (b).

The gear itself is distributed by Commander Service Forces, Pacific . . . . and in some instances is available before a complete manual about it can be written and distributed. In these cases, a temporary publication may be issued with the equipment by COMSERVFORPAC.

All other publications on NANCY equipment classified CONFIDENTIAL or below may be drawn from the Bureau of Ships, Washington 25, D. C.